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Recovery and substitute addictions in the Western Cape, South Africa: A multi-perspective approach

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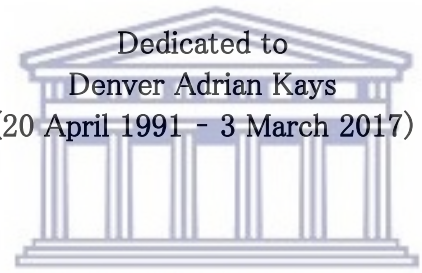
Keywords: substitute addictions; substitute behaviours; multiple methods; addiction recovery; relapse; South Africa

Dedicated to
Denver Adrian Kays
(20 April 1991 - 3 March 2017)



Abstract

Understanding substitute addictions, whereby a terminated addictive behaviour is replaced with another behaviour or addiction, has implications for assessment, treatment planning and recovery of Substance Use Disorders (SUDs). As the harms of addictive behaviours extend to communities and society, it is vital to keep pace with the evolving needs of persons in various stages of recovery and to equip service providers and adapt programmes accordingly. Yet, substitute addictions are under-researched globally. This study aims to explore the nature and dynamics of substitute addictions in the Western Cape, South Africa, using a multiple methods design, comprising five separate but interrelated sub-studies.

In Sub-study One, a scoping review of the literature on substitute addictions in persons with SUDs was conducted to gain a deeper understanding of existing literature; determine the state of the field; identify trends and ascertain how certain concepts are used. EBSCOhost, ScienceDirect, Web of Science and Google Scholar meta-databases were searched up to 2018 and yielded 63 studies. Data were synthesised using a Narrative Summary approach to identify gaps, themes and commonalities in the literature. The review concludes that few studies have explored substitute addictions in low- and middle-income countries (LMICs). There is no single definition of substitute addictions or consensus as to the terminology used to refer to it. Multiple factors are implicated in its aetiology (e.g. self-medication, harm reduction model and relapse prevention) and substitutes may present as long-term or temporary replacements.

For Sub-study Two, amidst the COVID-19 pandemic and South Africa's bans on the sale of alcohol and cigarettes, a case study was conducted to explore its potential implications for persons in recovery. Successive interviews with a participant in stable recovery (>5 years) were examined from a relapse and substitute behaviour framework. The case study demonstrates that the interplay of individual (e.g. coping skills to manage stress, cognitive and affective responses), environmental (e.g. recovery support, accessibility of substitutes) and addiction behaviour-related factors (e.g. pattern of appetitive effects, addiction history) may heighten the propensity to substitute addictions.

Sub-study Three determined the prevalence and associated factors of substitute addictions among inpatient substance use treatment service users (n=137, 66% follow-up rate). The Brief Assessment of Recovery Capital, the (adapted) Addiction Matrix Self-Report Measure and the Overall Life Satisfaction scale were administered to service users during and post-treatment. Intake and follow-up measurements were compared and data were analysed using R (version 4.0.4). At follow-up, 36%, 23% and 40% had respectively substituted their primary substance(s), relapsed and maintained abstinence. Substitute addictions were associated with mid-range levels of self-reported recovery capital, as well as having the prospect (rather than guarantee) of employment.

In Sub-study Four, service providers (n= 22) from inpatient substance use treatment facilities in the Western Cape participated in focus group discussions on their perceptions of substitute addictions. Questions focused on service providers' understandings of substitute addiction, related experiences of delivering treatment and recommendations for improving service provision. Transcripts were analysed thematically. Substitute addictions were understood by service providers to be substance (e.g. caffeine and cigarettes) or behaviour (e.g. eating, exercise, gambling, gaming, love, sex and shopping) based. Substitute motives were identified as filling the experiential void of the primary substance; legality and/or familial endorsement; managing cravings; masking feelings and emotions; self-medication; social acceptance and time-spending. Substitute behaviours were primarily conceptualised as a risk for relapse, and, while concurrent addictions were identified as a primary substitution mechanism by participants, screening for co-occurring behavioural addictions was not a standard practice.

Sub-study Five explored Narcotics Anonymous attendees' (n=23) perceptions and experiences of substitute addictions. Participants partook in in-depth interviews focused on a brief history of their substance use, prior treatment episodes, recovery experiences and views and experiences of substitute addiction. Data were analysed thematically. Four themes were identified: substances-based substitutes (cigarettes/vaping; coffee); behaviour-based substitutes (binge-watching, exercise, food, gambling, sex, pornography and relationships, shopping; stealing and work); harm (reduction) and substitution, and recovery support

needs. Participants reported a range of temporary and long-term substitutes across early (<1 year), sustained (1-5 years) and stable (>5 years) recovery stages. Participants used substitutes to calm, isolate and distract themselves; for harm reduction; mood modification; relapse prevention; self-medication; time-spending and to fill a perceived void. Behaviours, even seemingly healthy behaviours, were believed to require ongoing vigilance and self-monitoring to mitigate relapse risk.

Findings were integrated across sub-studies and theoretically underpinned by the Syndrome Model of Addiction and PACE model (Pragmatics, Attraction, Communication and Expectation). Taken together, this dissertation gives rise to prevention, practice, policy and research implications. To prevent substitute addictions, service providers should be equipped to recognise their potential to occur and their varied manifestations. Consequently, service providers should take a comprehensive (substance and behavioural) addiction history and systematically assess for biopsychosocial risks. Alongside work with service users, treatment services should incorporate a focus on service users' families, and educate them about relapse prevention, substitute addictions and available recovery support resources. For treatment to be aligned to service users' needs, these elements must be integrated into an individualised, and evolving treatment plan. Prevention also necessitates that service providers and service users in the Western Cape leverage the strong presence of recovery support groups (including Alcoholics Anonymous, Gamblers Anonymous, Narcotics Anonymous, Sex and Love Addicts Anonymous and Overeaters Anonymous), especially given the limited number of aftercare and reintegration services. For those pursuing peer-assisted recovery, linkages with other mutual aid groups are vital for prevention and management. Across these groups, attendees should be encouraged to self-monitor any substitute addictions and access (12-step) support groups or professional help as needed.

In practice, service providers and service users should jointly establish the goals (e.g. abstinence; harm reduction towards abstinence or moderation management) and parameters of their recovery. Key questions within this dialogic exchange are: How is recovery defined? How is relapse defined? Practically, treatment should equip service users

to self-monitor changes and underlying motives to identify whether substitute behaviours are supportive or threatening recovery. Given the association between recovery capital and substitution, (abstinence and relapse) in this study, the integration of recovery capital into the therapeutic framework stands to enhance conceptual models of treatment and recovery. Measures of recovery capital stand to reveal recovery assets and gains at the individual, interpersonal and environmental context levels to inform treatment planning. Further practice implications include the adoption of a transdiagnostic approach to target mechanisms common to substance- or behaviour-based addictions; establishing the nature, dynamics and interactions between identified addictive behaviours and building service users' repertoire of adaptive coping skills.

At a policy level, interventions to foster recovery and address substitute addictions should prioritise aftercare services as part of the continuum of care. In the South African context, where policies have been critiqued for not carefully attending to the content of aftercare and reintegration services, we advocate for the inclusion of substitute addictions as a key focus. Alongside efforts to enhance aftercare programming in South Africa, we recommend an enhanced policy focus on harm reduction. The design of these and other interventions should centrally involve persons in or seeking recovery in a participatory fashion. Future research priorities include the ongoing need to conceptually clarify substitute addictions with a long-term view towards a single definition or conceptualisation. We recommend further investigation of potential mediators and moderators of substitution using a life-course approach, and, relatedly, longer-term follow-ups to deepen understanding of the course and dynamics of substitute behaviours. To ensure the utility of such research and continue the development and refinement of the concept of substitute addictions, we urge researchers to stipulate their operational definitions and assumptions. Recognising the complex nature of South African society, future work on substitute addictions should aim to recruit participants across race, class and geographical divides. Further to that, future research on substitute addictions with service providers should seek to include a range of practitioner types and philosophies from public and private treatment services, as these are two distinct systems of care in South Africa.

Declaration

I declare that the research *Recovery and substitute addictions in the Western Cape, South Africa: A multi-perspective approach* is my own work. It has not been submitted before for any degree, or examination at any other university. All the sources I have used or quoted have been indicated and acknowledged as complete references.

Deborah Louise Sinclair

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Preface

The basis of this research can be traced back to 2016 when I first encountered the topic of substitute addictions. At the time, I was studying towards a Postgraduate Diploma in Addiction Care at Stellenbosch University as a way to stay connected to the field. The article that set me on this path - Sussman and Black (2008) - was, ironically, not part of the course material, but was something I came across when reading for an assignment. This concept of replacing one behaviour for another has common sense, and intuitive appeal and is something that most people can relate to. However, in the context of recovery, it has the potential for short-term gains and/or long-term harm. While research into substitute behaviours has a long history and there have been waves of interest in this area over time, the field has remained fragmented. This dissertation sought to explore the dynamic, complex phenomena of substitute addictions from multiple perspectives: the literature, people who use drugs, service providers and persons in recovery attending mutual aid groups. I hope that the new insights derived from this study, which has particularly prized subjective experiences of this phenomena, can translate into real-world action in treatment and recovery support services, and ultimately contribute to improved quality of life for those in and seeking recovery; however its parameters may be defined.

Chapter 1 outlines the broader context of this dissertation and its aim and objectives. *Chapter 2* maps the depth, breadth and gaps in the literature on substitute addictions in persons with SUDs using a scoping review. *Chapter 3* describes a case study of substitute addiction to show how, for this individual subject, compulsive pornography watching served as a substitute for his alcohol addiction. *Chapter 4* prospectively investigates the prevalence of substitute addictions and associated correlates, predictors and motivations among service users recruited from residential substance use treatment facilities. *Chapter 5* explores service providers' perceptions and experiences of substitute addictions in their substance use treatment settings and contexts. *Chapter 6* provides an in-depth exploration of substitute addictions through the views and experiences of members of Narcotics Anonymous. The dissertation concludes with a general discussion *(Chapter 7)* which

integrates the main outcomes of the research and illuminates the clinical, scientific and policy relevance of this study in South Africa. Its strengths and limitations are assessed and future research recommendations are offered.

As this dissertation comprises five separate papers at various stages of the publication process and to make each manuscript independent, there may be some overlap in content across chapters. Where certain quotes have resonated with the focus of a particular element of the dissertation, I have included them between chapters.

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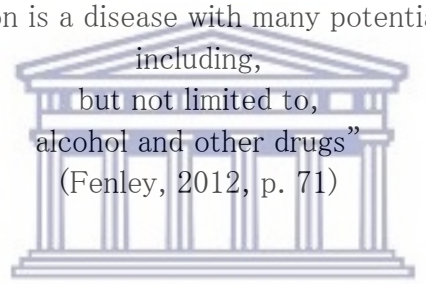
"Addiction is a disease with many potential faces,
including,
but not limited to,
alcohol and other drugs"
(Fenley, 2012, p. 71)



Chapter 1

General Introduction

1.1. Background and Rationale

Addiction recovery, which can be understood as "a voluntarily maintained lifestyle comprised of sobriety, personal health and citizenship" (Betty Ford Institute Consensus Panel, 2007, p. 222), is a challenging process of which relapse is often a part (Bashirian et al., 2021; Johnson, 1999). Relapse rates vary by type of substance used and intervention, but it has been estimated that as many as 40 to 60% of treated individuals relapse (McLellan et al., 2000) and/or develop new addictions post-treatment (Friend & Pagano, 2004). Relapse factors include available and accessible substances; boredom; excess money; lack of structured time and purposeful activities; loneliness; poor treatment retention; withdrawal; and substituting one addiction for another (Barati et al., 2021; Blume & García de la Cruz; Campos, 2009; Harris et al., 2005; Joe et al., 2001; Levy, 2008; Simpson et al., 1997; Sussman & Moran, 2013; Swanepoel et al., 2016). Substitute addiction(s), also referred to as switching addictions, cross addiction (Blume, 2021) or addiction hopping (Shaffer et al., 2004), is the termination of one substance or putative behavioural (or process) addiction and its replacement with another substance or behavioural addiction, to partially or fully satiate the same needs (Sussman & Black, 2008). Substitute addictions should be clearly distinguished from substitution treatment. For example, opioid substitution treatment is a management plan for Opioid Use Disorders in which a substitution opioid is prescribed (Weich et al., 2017). Substitute addictions may include licit and illicit substances, exercise, shopping, sex, food, work, love, religion, internet and video games, pornography, social networking, (not all of which are diagnosable clinical entities) and gambling, which is the only non-substance addiction formally recognised by the Diagnostic and Statistical Manual of Mental Disorders (DSM) 5 (Ali, 2021; Ascher & Levounis, 2015; Lewczuk et al., 2021; Sussman, 2017; Taylor, 2002).

Although the propensity to substitute addiction is not a concern for all persons in recovery (Ali, 2015; Sussman & Black, 2008; Sussman, 2017), substitute addictions occur

frequently (Horvath, 2006) and need to be detected and addressed during the treatment and recovery process, given the risk of remaining in active addiction (Sussman & Black, 2008) or relapsing to other (non-substance) addictive behaviours (see Blume, 1994). Proponents of the view that substitute substances and behaviours may serve a harm reduction function acknowledge that such behaviour may reduce harm in the short-run but ultimately hamper recovery (Horvath, 2006). High post-treatment relapse rates (Bowen et al., 2014) indicate that substitute addictions ultimately pose a threat to the efficacy of interventions. The experiential void from terminating an addictive behaviour may lead to a conscious or unconscious search for a substitute (Sussman & Black, 2008). It is therefore imperative to assess to what extent substitute addictions are present in treatment (representing early (<1 year), sustained (1-5 years) and stable (>5 years) recovery populations), to understand their course and nature and to identify best practices to prevent, detect and treat substitute addictions appropriately (Betty Ford Institute Consensus Group, 2007).

Despite the absence of recent prevalence data, treatment demand statistics (collated from registered treatment facilities) indicate that Substance Use Disorders (SUDs) are widespread in South Africa, and the Western Cape (see Dada et al., 2016). The harms of addictive behaviours are experienced by individuals directly and indirectly through various mechanisms and extend to communities and society. For example, SUDs are associated with adverse financial, medical and mental health and interpersonal consequences; car accidents; domestic violence; crime and legal problems (Mukku et al., 2012). SUDs are linked to increased healthcare costs, costs of crime and unemployment (Ettner et al., 2006; Holder, 1998). Furthermore, the lifestyle associated with some addictive behaviours (multiple partners; casual, unprotected encounters; trading sex for money or substances; Meade et al. 2016), route of administration (sharing of injecting equipment; Akindipe et al., 2014), intoxication effects and the nature of the addictive behaviour (e.g. compulsive sexual behaviour) are salient contributors to the transmission of HIV/AIDS. In 2015, 7 million South Africans were living with HIV (UNAIDS, 2015), of which 6.6% resided in the Western Cape (Poolman et al., 2017). The benefits of sustained recovery from addiction thus extend beyond persons with addiction.

South Africa is categorised as an upper-middle-income country with a gross national per capita income of $4,096 – $12,695 (The World Bank, 2022). However, South Africa is distinguished from other countries for having the highest levels of inequality globally (Davids, 2021). Unemployment is widespread (32.5%) and the present COVID-19 pandemic has increased poverty (The World Bank, 2021). Notwithstanding the lack of recent population-based studies and change in diagnostic criteria with the introduction of DSM 5, available data indicate that SUDs are highly prevalent in South Africa. Lifetime and 12-month prevalence of an SUD, respectively stand at 13.3% and 5.8%, while 30.9% of this latter category meet the criteria for a severe SUD (Herman et al., 2009). The Western Cape province is especially affected by SUDs as indicated by a markedly higher problem severity (6.5%) and lifetime prevalence (20.6%) (Herman et al., 2009). While South Africa's substance use treatment system is said to be the most developed in Africa, treatment challenges abound: access barriers are commonplace and need exceeds available services (Pasche & Myers, 2012). The cost of treatment and transport to treatment coupled with conflicting financial priorities pose a considerable barrier to care. Moreover, mental health services remain poorly integrated while the substance use workforce is small (Pasche & Myers, 2012; Pasche et al., 2015). Surveillance data from 82 substance use treatment facilities indicate that 6 317 persons received treatment in the first half of 2020. Of those, 31 facilities are situated in the Western Cape, accounting for 1323 admissions (21%). Community-based harm reduction was rendered to 868 persons in the Cape Metro region in this same period (Dada et al., 2021).

1.2. Problem statement

There is a near absence of studies on substitute addiction with extant studies identifying the need to "better understand the prevalence and functions of, and solutions to substitute addictions" (Sussman & Black, 2008, p. 167). In South Africa, limited research has been conducted on relapse rates and mechanisms, and the characteristics of people who relapse (Voskuil, 2015; Dada et al., 2015). Best practice guidelines stipulate that for treatment to yield optimal outcomes, it must (1) be sensitive to the individual needs of service users by tailoring the setting, treatment approach and services to their characteristics (which

may include substituting addictions); (2) address SUDs and an array of other needs in the course of treatment, underscoring the need to be attendant to co-occurring or sequential addictions and (3) be modified, based on on-going assessments, to ensure that changing needs are met (suggesting the need to identify substitute addictions to address these appropriately) (NIDA, 2012). These guidelines are resonant with Miller, Belkin and Gold's (1990) cautionary statement that treatment can only succeed when it adapts to the evolving characteristics of service users, and Schneider and colleagues' (2005) recommendation that the process of recovery must attend to all dynamics that increase the probability of relapse. Consequently, service providers must be formally trained to recognise substitute addictions in service users and have a thorough understanding of its implications for treatment engagement, retention and outcomes. The envisioned research thus stands to play an important role in establishing the nature and dynamics of substitute addictions in a sample of residential service users; how they are viewed by treatment providers and understanding recovery support group attendees' perceptions and experiences of substitute addiction. Findings will be used to inform treatment programmes and have the potential to improve formal training programmes designed to address theoretical and skills deficits in service providers (see Pasche et al., 2015).

1.3. Design and methods of the present study

This study employs a multiple methods research design (Morse, 2015; also termed multimethod research design, Morse, 2003). In multiple methods research, interrelated but self-contained, separate studies contribute to the overall aim of the research (Morse, 2015). As multiple methods research affords a more "complex and multi-dimensional" (Mingers & Brocklesby, 1997, p. 492) view of a phenomenon, it is especially fitting for exploratory studies. In multiple methods designs, methodological triangulation (the use of two or more methods) increases the validity of findings. With triangulation "the most comprehensive approach is taken to solve a research problem", thereby strengthening the overall research endeavour (Morse, 1991, p. 20). In the case of the present study, this entailed including multiple perspectives on substitute addictions. Given the near absence of research on substitute addictions, the multiple methods design is ideally suited to the current study in

that it provides an exploratory examination from multiple points of departure. In this study, each objective will be addressed with a specific sub-study.

1.4. Aim and Objectives

The overarching aim of this study is to explore the nature and dynamics of substitute addictions in the Western Cape, South Africa. Ultimately, this research endeavours to enhance the performance of recovery support and treatment services. The study uses a multiple methods design and multiple perspectives and will be conducted through five separate but interrelated sub-studies, guided by the following objectives:

- Objective 1 (Sub-study One): To review the available literature to understand the phenomenon of substitute addiction in persons with SUDs, identify gaps in the literature, and contextualise its features. A scoping review method was used.
- Objective 2 (Sub-study Two): To explore the experience of substitute addiction from a first-person perspective. A qualitative methodological framework and case study method were used.
- Objective 3 (Sub-study Three): To determine the prevalence of substitute addiction among service users after inpatient substance use treatment. A quantitative longitudinal cohort design was used.
- Objective 4 (Sub-study Four): To explore service providers' perceptions of substitute addiction. A qualitative methodological framework and focus group discussion method were used.
- Objective 5 (Sub-study Five): To explore recovery support group attendees' perceptions and experiences of substitute addictions. A qualitative methodological framework and in-depth interview method were used.

1.5. Behavioural addictions

A long-standing area of interest in the addictions arena is whether a behaviour or non-substance can be the object of addiction (Marks, 1990; Peele, 1985). For instance, Peele (1985, p. 23) questioned: "compulsive involvements that do not require intake of a chemical"

such as compulsive work, sex, exercise, gambling, love and patterns of food bingeing and food starving in the mid-80s. The terms 'behavioural' and 'process' addictions are now widely endorsed, and more behaviours are being theorised as addictions. Though some behaviours are considered valid, genuine addictions, others are held as contentious and speculative (Konkolÿ Thege et al., 2016). Billieux et al. (2015) caution against over pathologizing, noting that everyday behaviours are being conceptualised as process addictions through "an atheoretical and confirmatory approach". Such an approach, they contend, involves an a priori assumption that the behaviour in question is an addiction; the development of screening instruments using the criteria for identifying substance use and, ultimately research to establish whether risk factors are shared between the proposed behavioural addiction and SUDs. The authors argue for more appreciation of the "multi-faceted nature and heterogeneity" of behavioural addictions, over the generation of a symptom checklist (Konkolÿ Thege et al., 2016, p. 122). To advance this agenda, an Open Science Framework was established as a forum for the public, collaborative and incremental development of an operational definition of behavioural addictions (Billieux et al., 2017). It defines a behavioural addiction as "a repeated behaviour leading to significant harm or distress. The behaviour is not reduced by the person and persists over a significant period of time. The harm or distress is of a functionally impairing nature" (Kardefelt-Winther et al., 2017, p. 1710). Exclusionary criteria are an underlying disorder (e.g., impulse-control disorder); functional impairment consequent of wilful choice (e.g. high-level sports); intensive involvement without significant functional impairment or distress and engagement to temporarily cope with common stressors or losses.

The DSM 5's sole exemplar of behavioural addiction is Gambling Disorder, listed in the *Non-substance-related Disorders* component of its Substance-related and Addictive Disorders category (APA, 2013). Internet Gaming Disorder is listed as an emerging behavioural addiction in need of further research, while shopping, sex and exercise lack adequate evidence for inclusion (Potenza, 2014). The 11th Revision of the International Classification of Diseases (ICD-11) also includes Gaming Disorder (WHO, 2020).

1.6. Patterns of addictions

Addictions emerge in at least three distinct forms (Sussman et al., 2011): as multiple, simultaneous addictions; as multiple, successive addictions and, rarely, as single addictions over the life course (Miller et al., 1990a). Multiple, simultaneous addictions are referred to by terms such as 'multiple addictions' (Miller et al., 1990a; Carnes et al., 2005; Keen et al., 2015), 'concurrent addictions' (Sussman et al., 2015; Schneider & Irons, 2001), 'addiction co-occurrence'/ 'co-occurring addictions' (Sussman, 2017), 'co-existing addictions' (Griffin-Shelley, 1997), 'mixed addiction' (Schneider et al., 2005) and 'co-addiction' (Freimuth et al., 2008). According to Sussman et al. (2011), multiple simultaneous addictions refer to engagement in an addiction or finite set of addictions within 12 months. In the only South African study on multiple addictions, Keen, Sathiparsad and Taylor (2015) found that 54% and 24% of their sample of 123 inpatient service users in treatment for SUDs presented with addictions to gambling or sex, and coexisting gambling and sex addictions respectively. None of the three facilities from which participants were recruited routinely assessed for the presence of multiple addictions or incorporated its management into the treatment programme. Carnes et al. (2005) also propose an Addiction Interaction Disorder (AID), in which co-existing addictions interact, support and join each other in 11 distinct patterns. Interactions compound the harms of every addiction, and the addiction 'package' is more problematic than each on its own (Carnes et al., 2005). Of the 11 meta-patterns of addiction interactions that Carnes and colleagues (2005) identified, replacement (when one addiction is exchanged for another) and alternating addiction cycles (the dominant addiction shifts in a pattern) relate directly to substitute addiction (Sussman, 2017).

1.7. Substitute Addiction

There is no universally accepted definition of the second pattern of use/engagement: multiple, successive addictions or 'substitute addiction(s)' (Griffiths, 1994). Ali (2016, p. 710) defines substitute addiction as a "metamorphosis of addictions" where one form of addiction replaces another during recovery. This definition is broad enough to encompass one substance substituting for another substance, a substance substituting for behaviour, a behaviour substituting for a substance, or a behavioural addiction substituting for another

behavioural addiction. In their definition, Carnes et al. (2005) predict that between 6 - 12 months after establishing recovery, substitute addictions are likely to occur. Johnson's (1999) understanding of substitution, "…a transfer of addictions, the exchange of one harmful dependency for another" (p. 8), also suggests that it extends to substances and behaviours. A markedly different definition is offered by Reiman (2009), for whom substitution is "… the conscious choice to use one drug (legal or illicit), instead of, or in conjunction with, another due to issues such as perceived safety, level of addiction potential, effectiveness in relieving symptoms, access and level of acceptance" (p. 1). Reiman's (2009) perspective diverges from other understandings in its reference to a conscious choice to use, concurrent rather than sequential use and by only recognising a transfer from one substance-based addiction to another. These different understandings highlight the need for a single definition of substitute addictions that is broad enough to include its various potential manifestations, yet is specific enough to allow comparisons across studies.

Establishing the depth and breadth of the extant literature on substitute addiction is also complicated by the various terms used synonymously: 'addiction substitution' (Kennedy & Grubin, 1990); 'addiction hopping' (Kuss et al. 2017; Shaffer et al., 2004); 'addiction swapping' (Odom et al., 2010); 'addiction transfer' (McFadden, 2010; Odom et al., 2010); 'shifting addictions' (Michaelson, 1993); 'addiction replacement' (Schroder et al., 2008); 'cross-addiction' (Ali, 2015; McFadden, 2010; Griffiths, 1994; Johnson, 1999); 'substituting one addiction for another' (Harris, 2000) and 'switching addictions' (Blume, 1994).

Views on substitute addictions vary. One perspective is that substitute addictions lower the likelihood of relapse. That is, substitute addictions make the pursuit of recovery more manageable, and the newly acquired behaviours are adaptive for the person in early recovery (Horvath, 2006). Cravings for the original addiction weaken over time, and ultimately substitutes must be fully eliminated. From another viewpoint, substitute addictions signal relapse or that relapse is imminent. Recovery, from this viewpoint, requires immediate, complete abstinence and an awareness of how the original addiction can be replaced; substitute addictions lead to problematic use of another substance or compulsive engagement in behaviour or relapse to the former addictive behaviour (Blume, 1994).

Various studies demonstrate how the addictive pathway remains active through substitute behaviours. In Murphy and Hoffman's (1993) study of persons with Alcohol Use Disorders (AUD), 25 % of participants worked longer hours, ate desserts and smoked cigarettes to help readjust their lives in early recovery.

More recently, in Friend and Pagano's (2004) research among persons receiving treatment for an AUD, 15% initiated smoking, and former smokers were highly inclined to relapse. At a 12-month post-treatment follow-up, 54% of those that had initiated smoking were still smoking, with use progressing.

Blanco, Okuda, Wang, Liu and Olfson (2014) conducted a 3-year follow up investigation of recovery from a SUD in a US nationally representative sample of 34653 adults. Of those that terminated the use of their primary substance, 13% reported a SUD substitute addiction. However, with 27% of the sample acquiring another SUD without remitting from the primary SUD (i.e. concurrent and not sequential use), the authors concluded that substitute addiction seldom occurs. Critique levelled at the study includes its exclusive reliance on self-report, and as noted by Sussman (2017), its failure to explore behavioural substitute addictions.

Illustrative of how a behavioural addiction can precipitate relapse to a substance-based addiction, a case report by Blume (1994) describes a patient who attained abstinence from a SUD and substituted with gambling. With the control over gambling being transient, the patient relapsed to the SUD (cocaine and alcohol), as a perceived alternative to suicide. Substitute addictions, according to Ferguson (2010) may provide an *illusion of control*, i.e. the erroneous belief that the loss of control experienced with the primary addiction can be regained in the long term with a substitute, and that the damages of active addiction are avoided.

Taken together, these studies show that the range of terms used to refer to substitution may not be synonymous, and without systematic exploration, the status of the literature is unclear. Further, while different perspectives are observable these underscore that the prevention of relapse (broadly construed) is a shared concern. A key question that arises is whether substitution and substitute behaviours should be regarded as a problem for those in or seeking recovery.

1.8. Recovery

Addiction careers are often marked by multiple treatment episodes, periods of abstinence and relapse over several years before achieving stable recovery (Scott & Dennis, 2011; Scott et al., 2005). Addiction recovery is a complex and dynamic process (Vanderplasschen & Best, 2021), varying markedly by addiction career. Though limited, the literature base on recovery is characterised by diverse understandings of the term (Hser & Anglin, 2011), and the prevalence of recovery is largely unknown (White, 2016). White (2016) defines recovery as the resolution of addiction, as evidenced by unremitting abstinence or clinical remission; augmented overall health and functioning and improved relations between the person in recovery and their community. Using these criteria, it is possible to distinguish between full recovery, a partial recovery (full achievement or improvement in one domain, but continued impairment in other domains of functioning) and moderate recovery (resolution of addiction problems to the subclinical threshold) [White, 2016].

Based on a comprehensive review of the literature, it appears that more than half of individuals seeking to abstain from a SUD will achieve permanent, stable recovery after having lapsed on at least one occasion (White, 2010). Considering the chronicity of addiction, lapses and relapses are common but not typical of all pathways to recovery; that "relapse is part of recovery" is a widely held misconception (White, 2010). Though the risk of relapse is increased during the early post-treatment period, a significant proportion of those leaving treatment services will have attained and will maintain abstinence (White, 2010). Aftercare serves as a buffer against relapse. Although one week, one month, three months and one-year aftercare contacts and support can enhance long-term recovery outcomes (Leukefeld & Tims, 1989), structured, intensive, and ongoing post-treatment support is rarely provided. Recovery support group fellowships are expected to help/support recovery maintenance; however, rates of affiliation are low and attrition is high (Godley & White, 2011) and while helpful for some it may be detrimental for others.

Recovery capital can be understood as the range of internal and external resources that can be drawn upon to initiate and sustain recovery from addiction (Laudet & White, 2009). Laudet and White (2009) investigated the recovery trajectories of a sample of 312 persons in recovery from heroin and crack cocaine who self-identified with ethnic minority

groups. Respondents were interviewed at two points in time, one year apart. The study indicates that "higher levels of recovery capital prospectively predict sustained recovery, higher quality of life, and lower stress one year later" (p. 27).

1.9. Relapse

Perspectives vary on whether relapse is a gradual process or discrete event (Hser et al., 2007). According to White and Ali (2010), addiction and recovery are best viewed along a continuum ranging from excessive, compulsive, and problematic use on the one extreme to stable recovery on the other. The midpoint between the two is a recursive cycle of use and abstinence.

Hser, Hoffman, Grella and Anglin (2001) conducted a 33-year follow-up study of 581 males with a heroin use disorder, of which 242 were available at the final follow-up. Findings revealed that although the likelihood of future relapse declined considerably once abstinent for 5 years, a quarter of those that had been abstinent for as long as 15 years, relapsed. Scott, Foss and Dennis' (2005) study of 1326 service users that were followed for 6, 24- and 36- months post-intake, identified eight factors that are predictive of relapse: sex (male), fewer lifetime arrests, multiple prior treatment episodes, less legal problems, homelessness, friends in active addiction and less attendance of recovery support group meetings 6 months before they relapsed.

Vanderplasschen, Colpaert and Broekaert (2010) sought to investigate the factors that predicted relapse and readmission to residential treatment. Of the 249 service users with AUDs drawn from five Belgian psychiatric units, 54% had relapsed six months post-treatment. Relapse was attributed to perceived dissatisfaction with day-to-day activities as well as the extent of alcohol-related problems. Re-entry to treatment was found to be contingent upon the severity of psychiatric symptoms and subjectively lower well-being at a 6-month follow-up.

1.10. Theoretical Positioning of the Study

This dissertation is located within the disciplines of psychology and orthopedagogy, where the latter is defined as "a science of action" targeting persons in marginalised

situations (Broekaert et al., 2004, p. 206). Within this context, the Syndrome Model of Addiction (Odegaard et al., 2005; Shaffer et al., 2004), which proposes that addiction is best understood as a syndrome with distinct presentations, will be used to theoretically ground the study. A syndrome, Shaffer and colleagues (2004) contend, is a constellation of symptoms and signs (which are not all necessarily present simultaneously) related to an underlying condition. The model comprises *Distal Antecedents of the Addiction Syndrome,* as well as a *Premorbid Addiction Syndrome.* Distal Antecedents include neurobiological and psychosocial components that render an individual vulnerable to addiction when their exposure to and interaction with the addictive agent is reinforced through responses meeting expectations. During the *Premorbid Addiction Syndrome* phase, the individual either crosses the threshold to addiction or remains at risk for the development of the syndrome, depending on their subjective experiences with the addiction of choice. The theory further proposes that multiple (potential) expressions of addiction signal that the object of addiction (i.e. a substance or behaviour) is a less central concern than is the presence of the syndrome. Consequently, this model is well-suited to the study's focus on substitute addictions, which constitute different expressions of the addiction syndrome (Shaffer et al., 2004).

The PACE (Pragmatics, Attraction, Communication and Expectation) model (Sussman et al., 2011; Sussman, 2017) will complement the contributions of the Syndrome Model of Addiction. The PACE model considers the interaction of genetic, ecological, situational and learning variables to offer a comprehensive explanation of why some addictions may be initiated and maintained rather than others (Sussman et al., 2011). *Pragmatics* is concerned with access to addictive behaviour to facilitate regular engagement. Access in turn encompasses supply and awareness of supply sources of the addictive agent, acquisition skills and the means of exchange to offer in return for the addictive agent (Sussman et al., 2011). *Attraction* to the addictive behaviour is based on individual differences in the resultant acute effects (e.g. relaxation as opposed to anxiety), the severity of withdrawal or the rituals involved in engaging in the behaviour (Sussman et al., 2011). *Communication* denotes in-depth knowledge of the addiction-specific language, feelings of belonging and self-identification with activities and groups related to the addiction due to the use of common terms and, the potential to make disparaging remarks about another

addiction, thus solidifying specific addictive behaviours (Sussman et al., 2011). *Expectation* relates to the extent to which the individual's expectations have been met by the addictive behaviour - if expectations are adequately met, another addiction will not be sought out and engaged in. The PACE framework will thus offer a contextual understanding of substitute behaviours and addictions within the study.

1.11. Significance of the study

Substitute addictions pose a considerable threat to the achievement and maintenance of recovery and have the potential to occur in any person with an addiction (Sussman, 2017; Sussman & Black, 2008). However, substitute addictions remain under-researched. Extant South African studies have explored multiple addictions (Keen et al., 2015) and behavioural addictions (Sinclair et al., 2016), yet no studies focus on (behavioural and substance) substitute addictions, and recovery capital; all of which have implications for the delivery of treatment and recovery support services. This salient shortcoming in the research literature is the impetus for the current study which endeavours to involve service users, service providers and recovery support group attendees. In the face of widespread substance use and its accompanying public health effects as well as barriers to accessing treatment services, it is vital to ensure that those who succeed in entering treatment services engage with service providers that can competently attend to their changing needs (see Miller et al., 1990a; Pasche et al., 2015). It is also essential to ensure that those who enter recovery via other pathways, such as recovery support groups, are supported in their pursuit of stable/enduring recovery. Understanding the prevalence of substitute addictions, as well as ascertaining service users, service providers and recovery support group attendees' perceptions is an essential first step to preparing service users and providers to detect substitute addictions, and designing programmes that incorporate this key aspect of addiction, thus adding to the evidence-base.

Chapter 2

Substitute addictions in persons with substance use disorders: A scoping review[1]

Abstract

Substitute addictions, addictive behaviours that sequentially replace each other's functions, have implications for recovery trajectories but remain poorly understood. We sought to scope the extent, range, and characteristics of research on substitute addictions in persons with SUDs. Using Arksey and O'Malley's framework for scoping reviews, a systematic search was conducted to identify publications that referenced substitute addictions up to April 2018. Study characteristics were extracted and summarized to provide an overview of the extant literature. The 63 included studies show that substitute addictions are terminologically and conceptually ambiguous. Much of the available literature is concentrated in developed contexts - and in particular the United States of America. While presentations varied, at least two sub-types of substitute addictions appeared: long-term replacement and temporary replacement. Existing theories suggest a multifactorial aetiology. The findings suggest a strong need for increased awareness of substitute addictions and their potential consequences for recovery; interventions that structure prevention and pre-, during-, and post-treatment interactions as well as future research to explore its nature and dynamics drawing on multiple methods.

[1] Based on Sinclair, D. L., Sussman, S., Savahl, S., Florence, M., Adams, S., & Vanderplasschen, W. (2021). Substitute addictions in persons with substance use disorders: A scoping review. *Substance Use & Misuse, 56*(5), 683-696. https://doi.org/10.1080/10826084.2021.1892136

2.1. Introduction

The existence of substitute addictions has been recognized for decades (Chopra & Singh Chopra, 1932; Koball et al., 2019; Miller et al., 1983; Savitt, 1954). Substitute addictions denote the sequential replacement of an addictive behaviour by another to derive similar appetitive effects when the former is abstained (Sussman, 2017). Addictive behaviours in this review refer to both those disorders listed in the DSM 5 with established criteria and behaviours that may not meet the criteria, but that are subjectively experienced as an addiction (e.g. Sussman, 2020).

Substitute addictions can be distinguished from comorbidities. Comorbidities refer to the presence of more than one identifiable condition within an individual concurrently, which may involve one condition adding on to another at some point (Valderas et al., 2009). Comorbidities may include a variety of mental health conditions, including addictive behaviours as one of the disorders (dual diagnosis); however, only potentially addictive activities and objects are considered substitute addictions.

Substitute addictions have been attributed to a cognitively implicit or explicit search to fill the void of abstaining from the primary addictive behaviour(s) (Sussman & Black, 2008). The availability and accessibility of potential substitutes in times of forced abstinence, ability to produce desired appetitive effects and earlier experience with the activity or behaviour may play a role in substitution (Sinclair et al., 2020; Sussman, 2017). Moreover, substitutes have also been used in the short term as a tool to manage early recovery (Horvath, 2006; White & Kurtz, 2006). Yet, while substitute addictions may present a pathway to achieving the personal, familial and societal benefits conferred by recovery (Sussman, 2017), it may be "a mutation of the existing problem" leading to similar or greater harm, the development of another addiction and/or relapse (Moore, 2010; White & Kurtz, 2006, p. 5). Despite anecdotal and empirical evidence of its existence, several gaps exist in the knowledge of substitute addictions.

A frequent assertion in the literature is that substitute addictions are under-researched (Ali, 2015; Koball et al., 2019). To date, efforts to synthesize the literature on substitute addictions in the context of substance use have focused on alcohol and cannabis

(Staiger et al., 2013; Subbaraman, 2016) and the impact of policy decisions on the consumption of alcohol (Moore, 2010). A comprehensive and up-to-date synthesis of the extent and nature of research on substance (e.g. alcohol or food) and behavioural (e.g. gambling or sex) substitute addictions in persons with SUDs is yet to be conducted. Systematically identifying and analysing the current state of the scientific literature will afford a better understanding of the nature and dynamics of substitute addictions and the gaps and limitations in knowledge.

Consequently, the goal of this scoping review is to assess the published literature on substitute addictions in persons with SUDs to advance the field and generate insights for research and practice. As scoping reviews do not impose quality criteria, they are more suitable to provide an overview of the research conducted within a research arena than are systematic reviews. We examined the literature from early use of this concept up to April 2018 and aimed to 1) ascertain how substitute addictions have been defined by researchers; 2) examine the clinical presentations of substitute addictions; 3) establish the prevalence, samples and contexts, studied; 4) establish the methods used to study this concept; 5) and examine theories of substitute addictions. The focus on persons with SUDs is motivated by the fact that SUDs are presently by far the most researched primary addiction (Sussman, 2020). This is, to the best of our knowledge, the first scoping review on substitute addictions in persons with SUDs.

2.2. Method

This scoping review was guided by Arksey and O'Malley's (2005) methodological framework and entailed the following steps: (1) formulating a research question; (2) sourcing relevant literature; (3) selecting literature; (4) extracting the data, and (5) synthesizing and presenting the results. A scoping review was preferred as it enables greater coverage of a topic than do systematic reviews where the quality of evidence has primacy. We did not register or publish the protocol for this scoping review. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist was followed to report on the review (Tricco et al., 2018).

2.2.1. Search strategy

The databases were selected in consultation with the research team. We developed the initial search strategy and search terms based on the literature to identify the variety of terms that have been used to refer to substitute addictions. EBSCOhost (Academic Search Complete, Cinahl, E-Journals, ERIC, Health Source: Consumer Edition, MasterFILE, MEDLINE, PsycARTICLES and SocINDEX), ScienceDirect, Google Scholar, and Web of Science meta-databases were searched from inception to April 2018. All types of study designs were included (including case studies and other pre-experimental designs) and no limits were imposed on the date of publication. We searched for empirical, conceptual and case study articles that described the shift from a SUD to another addictive behaviour (substance or behaviour) across qualitative, quantitative and mixed method study designs, using the following search terms: "substitute addiction"; "switching addictions"; "cross addiction"; "addiction transfer"; "addiction hopping"; "replacement addiction"; "addiction substitution"; "addiction swapping"; "shifting addictions"; "addiction replacement"; "substitute dependency"; "compensatory addiction"; "secondary addiction", and "substance substitution". Additional, relevant literature was identified through reference mining of included studies.

2.2.2. Article selection

We focused on English-language publications that reported on substitute addictions amongst persons who use substances. Only adult samples (with participants aged 18 and older) were eligible as the review is part of a broader study on substitute addictions in adults. Youth were excluded because they represented a rather different population in terms of SUDs (e.g. shorter substance use history; Sussman, 2017). Publications were excluded if the source was grey literature, books (except for accessible stand-alone chapters) or editorials and if the substitution was employed purposefully, e.g. for medically assisted treatment. Study selection was undertaken in three steps, namely, screening of the 1) title, 2) abstract, and 3) review of the full-text article. The initial search yielded 3071 potential publications across all databases (EBSCOhost= 537; Elsevier ScienceDirect= 417 Google Scholar= 2060 and

Web of Science= 57). One reviewer screened all titles and abstracts against the eligibility criteria. Full-texts were retrieved of relevant articles, for those with unavailable abstracts or when descriptions were vague and there was uncertainty about whether substitute addictions were discussed. After screening titles for relevance, removing duplicates (n = 2995) and adding articles identified through reference mining (n = 82), 109 publications were included for full-text appraisal. Two reviewers screened all full-texts for suitability. In the first round, included articles were independently assigned to broad categories by each reviewer. In a second round, the categories to which articles were assigned were discussed and any discrepancies were resolved through discussion. A separate team of three reviewers jointly screened included articles for relevance, which demonstrated consensus with the first two reviewers. Forty-six articles were excluded and a total of 63 publications were included in this scoping review. Figure 1 details the article review screening process.

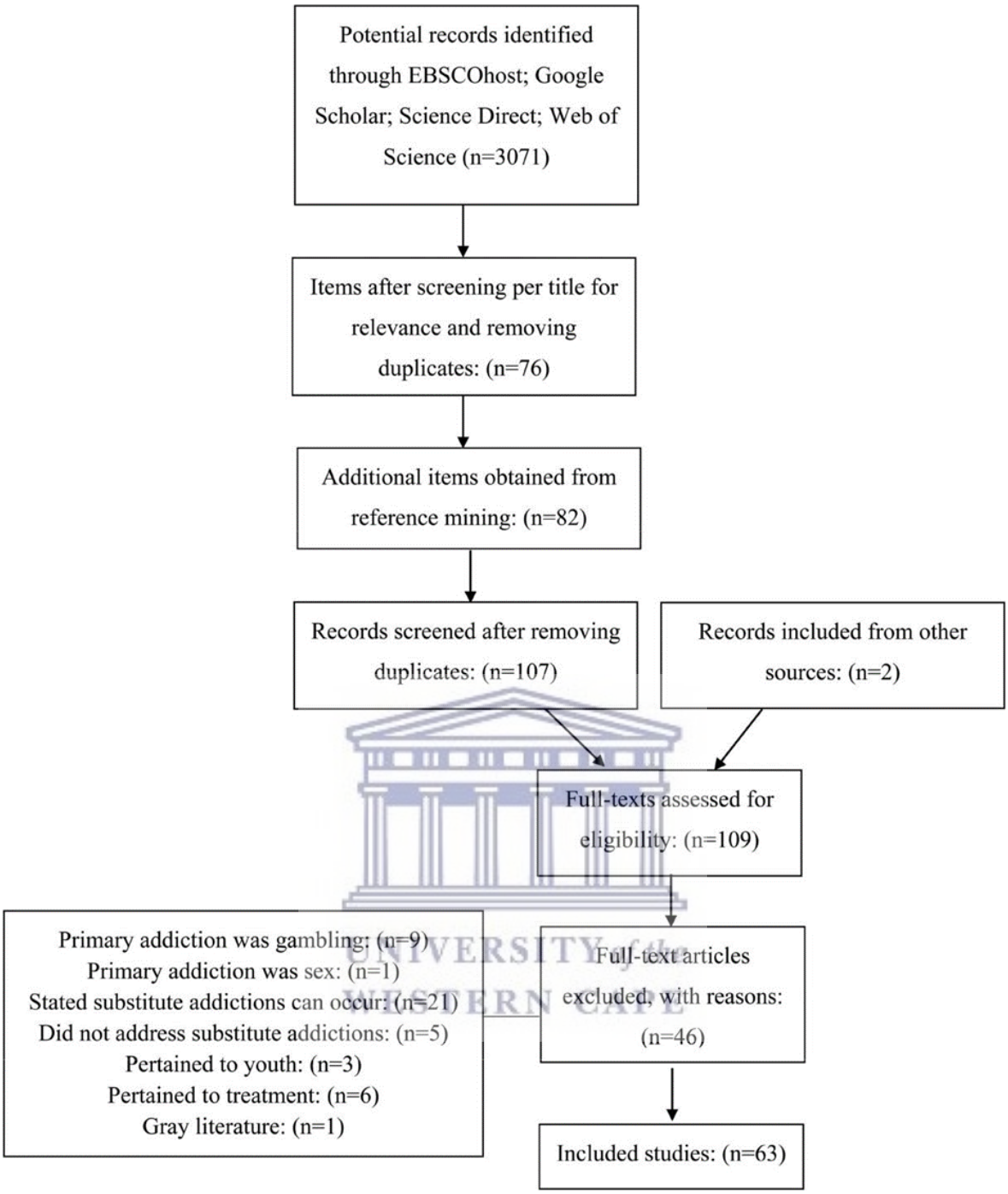


Figure 1. PRISMA-ScR flow diagram

2.2.3. Data extraction and synthesis

The categories of the data extraction form were: study aim; sample (size and characteristics); setting; method; type of substitute addiction; key findings; and (where applicable) theoretical approach. Data were synthesised through textual narrative synthesis,

which allows for studies to be grouped by evidence type and contrasted according to their characteristics, aiding the identification of gaps in the literature and appraisals of the strength of the evidence (Lucas et al., 2007).

2.3. Results

We identified 63 articles, published between 1932 and 2018, of which 41 were quantitative and qualitative studies, 10 were conceptual papers, three were reviews, and nine others were case reports. Table 1 summarizes the key attributes of the selected articles. Definitions of substitute addictions offered within these articles are presented in Table 2. Key findings from these papers are discussed in detail in the following section.

Table 1

List of reviewed studies (n=63) summarizing key study attributes

Author(s)	Study aim	Sample and context	Key findings
Ali (2015)	To emphasize the clinical observation of substitute addictions	Two males receiving treatment for opiate addiction: Sudan	Patient 1: Substituted opiates with sex (several extramarital relationships, leading to divorce). Patient 2: Developed a "preoccupation" with pigeon-keeping
Beary et al. (1986)	To investigate the association between alcohol 'abuse' in eating disorder patients	20 'alcoholic' women aged 40 or under Case 3: Nursing sister: UK	Treated twice before for anorexia nervosa. "Anorexia was my Valium until I discovered booze." While an inpatient, abstained alcohol but also reduced food intake. Attended a self-help group for anorexia nervosa on discharge and remained alcohol-free. Changed to a bulimia nervosa pattern at a normal weight. Developed alcoholism and eating pattern and weight normalized. When abstaining alcohol returned to bulimia
Buga et al. (2017)	To present a case of cross-addiction	24-year-old male with recurrent Hodgkin's lymphoma: USA	Substituted opioids for benzodiazepines, then for alcohol and muscle relaxants; relapsed to opioids and benzodiazepines
Çepik et al. (1995)	To present a case of an 'alcoholic' patient who developed bulimic symptoms in the abstinence period	24-year-old male with 'alcohol dependency': Turkey	Developed bulimic symptoms only during alcohol abstinence
Chopra and Singh Chopra (1932)	To describe chloral hydrate and paraldehyde as drugs of addiction	40 cases of chloral hydrate addiction 75% were between 21 – 40 years Majority also addicted to alcohol or opium: India	47.5% (n = 19) started chloral hydrate as a substitute for alcohol or for enhancing its effects. Whereas alcohol was less accessible due to reductions in licensed shops, and high costs, chloral hydrate was cheap, available, and attained with comparatively small doses and in less time, states produced with large doses of alcohol and opium
Savitt (1954)	To contribute to the psychoanalytic literature on narcotic addiction	19-year-old male college student, addicted to marijuana and heroin: USA	Within nine months of psychoanalysis achieved abstinence from narcotics. As use decreased began to "act out sexually", classed by the therapist as a substitute addiction "but a more suitable way of seeking gratification"
Tadpatrikar and Sharma (2018)	To highlight the psychosocial factors underlying substitute addiction	23-year-old male: India	Abstained cannabis and substituted with pornography viewing and increased technology use, with occasional tobacco and cannabis use
Wilkinson et al. (1969)	To report on bromism in association with alcoholism	Three admissions to the Alcoholism Clinic of St Vincent's Hospital: a 44-year-old male clerk; a 49-year-old female domestic worker and a 40-year-old male postal clerk: Australia	A: abstained alcohol for 4 years, using 70 "Seda-tabs" daily for six months; post-treatment, total abstinence. B: abstained alcohol for 1 year, using "Relaxa-tabs" increasingly, post-treatment, total abstinence then relapsed to "Relaxa-tabs". C: abstained alcohol for 6 years, used "Relaxa-tabs" and "Seda-tabs" (8 – 9 then 20 – 30, daily) in the last 3 months, refused treatment.

Young and Suler (1997)	To review and discuss the efficacy and limitations of online interventions for persons with internet addiction	39-year-old female with a 10-year history of Alcohol Use Disorder before entering AA: USA	After abstaining alcohol for one year, escalated weekly internet use from 15 to 60 – 70 h/week; chatting and routinely engaging in cybersex. Regarded as a "safe" substitute addiction "… being addicted to the Internet is better than being an alcoholic. I fear if I gave up the Internet I would begin drinking again."
Brown et al. (1973)	To study the use of alcohol by 'addict' and 'non-addict' populations	(n = 140, 'narcotics addicts', in treatment) (n = 100, 'non-addict non-alcoholics'): USA	Use of alcohol decreased with involvement with heroin and did not increase during treatment
Cohen (1981)	To review the available literature on alcohol and other drug interactions	n = 974 (in treatment): USA	Two drugs most frequently substituted for were heroin and illegal methadone; alcohol and marijuana were the most frequently used substitutes. The primary substance of those who reported substituting was: alcohol (n = 299; 31%); heroin (n = 269; 58%); other opiates (n = 92; 48%); amphetamines (n = 119; 37%); barbiturates(n = 115; 48%); minor tranquilizers (n = 112; 32%); marijuana/ hashish (n = 294; 44%); illicit methadone (n = 92; 69%); cocaine (n = 138; 48%); hallucinogens (n = 112; 39%) and inhalants(n = 45; 29%)
Copersino et al. (2006)	To examine the self-reported reasons for quitting marijuana use, changes in other substance use during the quit attempt, and reasons for the resumption of use	n = 104 (non-treatment-seeking persons who smoke marijuana): USA	Of those already using, 13% increased coffee; 32% increased alcohol; 32% increased tobacco; 2% increased tranquilizers; 7%, 4%, 5% and 1% respectively increased sleeping aids, cocaine, pain medication and other opiates. 1–6% reported initiating new substance use
Crost and Guerrero (2012)	To study the effects of an increase in the availability of alcohol on the consumption of marijuana	n = 71 (18 – 24): USA	Legal access to alcohol causes a significant decrease in marijuana use close to the age of 21
Devenyi and Wilson (1971)	To describe barbiturate 'abuse' in an 'alcoholic' population over a three-year period	n = 129 ('alcoholics', treated): USA	n = 5 terminated alcohol and switched to exclusive barbiturate 'abuse'; n = 1 abstained heroin, switched to barbiturates (easier to acquire), and turned to alcohol while maintaining barbiturate use
Ford (1956)	To clarify whether the use of certain drugs in the treatment of alcoholism is potentially dangerous	n = 139 (treated, primary diagnosis of 'chronic alcoholism'): USA	23% (*n* = 32) regularly used drug(s) with alcohol or had substituted drugs for alcohol: 16 were drinking and taking barbiturates or had substituted barbiturates for alcohol (8 were addicted to barbiturates); 10 drank and took barbiturates and other drugs or had substituted one or more of these drugs for alcohol; another 6 either combined alcohol with drugs other than barbiturates or had substituted them for alcohol
Hodgins et al. (2017)	To explore the self-reported increases and decreases in other substance use in recovery from Cannabis Use Disorder, through treatment or self-directed efforts	n = 119 (persons with lifetime but not past year Cannabis Use Disorder): Canada	The 26.1% that only increased use of other substances had fewer cannabis-related problems and tended to have self-directed recoveries

Hughes et al. (2008)	To describe the natural history of attempts to change marijuana use in 'dependent 'adults who were trying to stop or reduce use through self-directed efforts	n = 19 (persons who smoke marijuana daily): USA	Abstinence/reduction did not change alcohol or caffeine use nor was it linked to new onset of alcohol, caffeine, tobacco or illicit drugs among those who had never used it
Maletsky and Klotter(1974)	To clarify the relation between alcoholism and cigarette smoking	n = 57 ('alcoholics', in treatment); n = 50 (non-hospitalized controls): USA	16.2% ($n = 6$) of the 37 that abstained alcohol had significantly increased cigarette consumption when queried 4 weeks later. Those treated for withdrawal with paraldehyde ($n = 10$) increased smoking minimally on abstinence days 2 – 4, then reduced use to below baseline levels
McGlothlin et al. (1970)	To investigate the effects of marijuana shortages during the 1969 Mexican/American border closure	n = 478 (college students); n = 116 (drug treatment patients): USA	Of those reporting a marijuana shortage, 76% of students and 84% of patients substituted with one or more of hashish, alcohol and hallucinogens (patients also with sedatives, stimulants and opiates)
Miller et al. (1990)	To examine the rate of DSM-III-R diagnosis of marijuana 'dependence' among persons with a diagnosis of cocaine 'dependence'	n = 232 (inpatients; treated); n = 51 (outpatients; treated): USA	The retrospective inpatient, and prospective outpatient, and inpatient studies yielded rates of marijuana 'dependence' of 53%, 42%, and 51%, respectively, in patients with cocaine' dependence'. Marijuana was used to "come down" or "sedate" cocaine-induced anxiety, relieve cocaine-induced "depression," to substitute when cocaine was unavailable and to use as the "drug of choice" or primary drug
Peters and Hughes (2010)	To investigate whether alcohol and other substance consumption changes during marijuana abstinence	n = 28 (non-treatment seeking marijuana smokers): USA	Alcohol was especially substituted by those with past alcohol 'abuse' or 'dependence' histories (52% increase). Use of cigarettes, caffeine, and non-marijuana illicit drugs did not increase
Petry (2001)	To evaluate the effects of drug prices on hypothetical drug-purchasing decisions	n = 53 (persons who 'abuse' alcohol): USA	Alcohol is a substitute for cocaine
Schut et al. (1973)	To investigate alcohol use by narcotics 'addicts' in MMT	n = 100 (patients in MMT): USA	52% abstained alcohol once they took their first drug. After an average of 18 months of treatment, $n = 20$ drank "more" or "much more"
Verinis (1986)	To expand knowledge on the link between heavy alcohol and heavy caffeine use	n = 56 ('alcoholics', in treatment): USA	Significantly more coffee was consumed presently and in the first month of treatment, than six months pre-treatment
Waldorf (1970)	To investigate social adjustments during long-term voluntary abstinence from heroin	n = 163 (males who use heroin; in treatment): USA	51% substituted during heroin abstinence – 38% had a period of heavy alcohol use; other drugs were used to excess by 27%. Persons who have used heroin for five years and more substituted more, and drank more than persons who used short-term
Aharonovich et al. (2005)	To examine whether cannabis use during follow-up post inpatient treatment	n = 250 (treated, DSM-IV alcohol, cocaine, and/or heroin dependence): USA	29.2% ($n = 73$) used cannabis post-treatment, predicting relapse for alcohol and cocaine but unrelated to heroin outcomes

	affected cocaine, alcohol, and/ or heroin use		
Allsop et al. (2014)	To test if alcohol and/or tobacco serve as substitutes during cannabis abstinence, and the related predictive factors	n = 45 (non-treatment seeking DSM-IV 'cannabis dependent'): Australia	Substitution was more likely when alcohol and tobacco consumption pre-abstinence was lower; cigarette substitution was more likely with more severe cannabis withdrawal-related symptoms (e.g. insomnia and restlessness)
Anglin et al. (1989)	To examine the relation between use of alcohol and heroin by narcotics 'addicts'	n = 375 ('heroin addicts' in treatment): USA	Tendency to use alcohol heavily before addiction to heroin, use it lifelong, and inversely with heroin: decreasing upon exposure and addiction to heroin, and increasing use during treatment
Blanco et al. (2014)	To determine whether abstinence from a SUD increases the risk of onset of a new SUD after a 3-year follow-up compared with non-abstinence from an SUD	n = 34653 (nationally representative of adults with SUDs): USA	Approximately 13% ($n = 2741$) of those who abstained an SUD developed a new SUD
Carmelli et al. (1993)	To prospectively investigate changes in drinking in relation to changes in smoking over a 16-year period	n = 5510 (WWII Veteran twins): USA	Smoking cessation is associated with increased alcohol consumption
Conner et al. (1999)	To investigate whether cigarette smoking increases in drug treatment	n = 346 ('drug abusers' in treatment): USA	Drug treatment was associated with greater cigarette consumption
Darke et al. (2006)	To determine whether reductions in heroin use were associated with reductions in the use of other drugs over a 24-month period	n = 615 (persons who use heroin; treated): Australia	No evidence for drug substitution when heroin use was reduced
De Leon (1987)	To explore the treatment outcomes in a therapeutic community	n = 248 (treated, graduates + dropouts): USA	Among the opioid-abstinent group, alcohol use increased post-treatment. For some, difficulties with alcohol existed both before and after treatment and, for a few others, difficulties emerged post-treatment
Fairbank et al. (1993)	To compare use of six substances before admission to MMT and during the follow-up year	n = 513 (persons who use heroin; treated): USA	Other drugs were not substituted for heroin
Friend and Pagano (2004)	To examine changes in smoking status during and following treatment for alcohol use or 'dependence'	n = 387 (persons with DSM-III-R alcohol use disorders; in treatment): USA	15% initiated smoking during the 12-month follow-up period, most beginning during treatment and increased significantly between the 3- and 15-month assessments
Kadden et al. (2009)	To examine whether persons treated for marijuana dependence increased their use of alcohol when reducing or abstaining marijuana	n = 207 (wanted help stopping/ decreasing marijuana use): USA	No relationship between the use of alcohol and marijuana

Koball et al. (2019)	To examine substance-food substitution in persons undergoing residential treatment for SUDs	n = 44 (in treatment): USA	No significant change in pre- to post- food addiction and food cravings
Kohn et al. (2003)	To examine associations between smoking status and 12-month substance 'abuse' treatment outcomes	n = 649 (DSM-IV alcohol/drug abuse/ dependence; treated) USA	Of the 39.1% (n = 254) of non-smokers, 12% had initiated or returned to smoking at the 12-month follow-up
Miller et al. (1983)	To examine the broader impact of behavioural self-control training for problem drinking	n = 82 (problem drinkers): USA	No support for symptom substitution
Murphy and Hoffman (1993)	To describe experiences of alcohol abstinence maintenance up to 36 months post-treatment	n = 23 ('alcoholics', early recovery; treated): USA	25% (n = 6) substituted with desserts, cigarettes and longer work hours
Simpson and Lloyd (1978)	To investigate alcohol use and its relation to illicit drug use and treatment	n = 1409 (drug treatment sample): USA	Under 10% occasionally used alcohol as a substitute for opioids
Simpson and Lloyd (1981)	To investigate alcohol use post drug addiction treatment	n = 1155 (persons with opiate addiction; treated): USA	
Simpson et al. (1982)	To analyse and describe the outcome of a community treatment sample over six-years from treatment admission to follow-up	n = 990 (persons with opioid addiction; treated): USA	8% (n = 78) substituted opioids with alcohol, cocaine, barbiturates and amphetamines
Sokolow et al. (1981)	To investigate multiple substance use in clients treated at alcoholism rehabilitation centres	n = 1340 ('alcoholics', in treatment): USA	14.3% of pre-treatment multiple substance users, and 17.7 % non-drug using alcoholics increased their drug use post-treatment
Stephens et al. (2000)	To compare extended and brief treatments for marijuana use	n = 291 (treatment-seeking persons who use marijuana): USA	Alcohol or drug use did not increase with a reduction in marijuana use
Vaillant (1966a)	To examine the life course of 100 'addicts', the types of treatment they received and the relationship between treatment and periods of abstinence	n = 100 (males with a heroin addiction; treated): USA	n = 7 (23.3%) of the 30 stably abstinent used alcohol or other narcotic substitutes to excess
Vaillant (1966b)	To investigate the characteristics and determinants of abstinence	n = 30 (stable abstinence); n = 30(chronic 'addicts'): USA	Reasons for abstinence: a substitute for heroin, a new and meaningful relationship, or moving to areas with little drug use. n = 18 (60%) of stable abstinence (at least 3 years) and n = 5 (19%) of shorter abstinences (at least 1 year), substituted. Substitutes: (n = 1: food, markedly increased weight); marijuana (n = 1); chlordiazepoxide (n = 1); a religious sect (n = 1); work for AA (n = 1). n = 14: alcohol (some used

			to excess during the first year of abstinence; *n* = 4: sustained heavy drinking; *n* = 6: sustained heavy drinking leading to impaired health or diminished occupational efficiency)
Vaillant and Milofsky (1982)	To understand the recovery process in alcoholism	n = 110 (men who 'abuse' alcohol): USA	*n* = 49 who achieved a year or more of abstinence substituted: candy binges (*n* = 5); Valium and, Librium (*n* = 5); marijuana (*n* = 2); mystical belief, prayer, and meditation (*n* = 5); compulsive work or hobbies (*n* = 9); compulsive gambling (*n* = 2); compulsive eating (*n* = 3); chain-smoking (*n* = 7); increased involvement with religion and AA. 53% of those ever abstinent (*n* = 49) and 67% of those securely abstinent (*n* = 21) had a substitute addiction
Vaillant et al. (1983)	To conduct a prospective study of alcoholism treatment	n = 100 (persons who use alcohol; in treatment): USA	2 (13.3%) of 15 stably recovered "depended" on prayer and meditation
Colder Carras et al. (2018)	To explore how military veterans used video gaming to further their mental and behavioural health recovery	n = 20 (military veterans in treatment for mental/ behavioural health problems): USA	Several participants used games to replace substance use, aggressive or criminal behaviour
Cowan and Devine (2008)	To understand how males at different stages of recovery from substance 'abuse' experienced food, eating and weight changes, and used food in recovery	n = 25 (males in drug and alcohol recovery): USA	In early recovery (1–6 months): food (especially sweets and "junk" foods) were used as a substitute, to regulate moods, alleviate boredom, satisfy cravings, and provide structure to days. In mid (7–13 months) recovery: few used food as a substitute, to alleviate boredom and/or to satisfy food cravings. In later (14–36 months) recovery: food did not serve as a substitute

[1]We do not endorse stigmatizing, pejorative language; samples are described as they were by authors, and should be considered within the context of the time of publication.

2.3.1. Definitions

Ten publications offered a clear definition of a substitute addiction (Table 2), but the term is defined variably and primarily in terms of substances as replacements. Three case studies that provided definitions recognized substances and behaviours as potential substitutes (Ali, 2015; Buga et al., 2017; Tadpatrikar & Sharma, 2018), as did the one conceptual article that offered a definition (Sussman & Black, 2008). In contrast, nomothetic empirical articles that defined substitute addictions operationalized it in terms of the exchange of substances (Simpson et al., 1982; Sokolow et al., 1981), as did the three included reviews (Moore, 2010; Staiger et al., 2013; Subbaraman, 2016). Finally, Conner et al. (1999) cited Kazdin's (1982) definition of 'symptom substitution', a formerly used concept based on the psychodynamic model, including but not limited to addictive behaviours.

The database searches and reviewed studies revealed the use of a variety of terms to refer to substitute addiction and its specific presentations. The most widely used terms were 'substitute addiction', 'cross addiction', 'substance substitution', 'switching addictions', and 'substitute dependency'. 'Addiction transfer' was used less commonly and tended to refer to one addiction replacing another, post-operatively, particularly after bariatric surgery. The term 'secondary addiction' yielded only one relevant study and was also used to refer to concurrent use of a substance (Chopra & Singh Chopra, 1932).

Table 2

Definitions of substitute addictions as reported in included studies

Authors	Term	Definition
Ali (2016, p. 710)	substitute addiction/ cross addiction	"The apparent remission from use of a substance and migration to another substance or a behavioural addiction"
Sussman and Black (2008, p. 167)	substitute addiction	"Any addictive behaviour that serves at least one key function previously achieved by another addictive behaviour"
Buga et al. (2017, p. 39)	cross addiction	"The substitution of one addiction with another"
Conner et al. (1999, p. 64)	symptom substitution	"The appearance, during the successful elimination of a particular symptom, of a new symptom during treatment"
Sokolow et al. (1981, p. 150)	substitution effect	"Drug use is interchangeable with alcohol use"
Moore (2010, p. 403)	substitution	"Switching from alcohol to other substances of abuse (intoxicants) to achieve the goals of intoxication"
Simpson et al. (1982, p. 1321)	substitution	"Persons who stopped daily opioid use but began heavy use of other drugs, including alcohol and nonopioid drugs"
Staiger et al. (2013, p. 1189)	substitution	"… replace their primary drug with alcohol"
Subbaraman (2016, p. 1399)	substitutes	"One drug can pharmacologically replace the other"
Tadpatrikar and Sharma (2018, p. 1)	substance substitution /substitute addiction	"… using one substance instead of another" "Substitute addictions may be gambling, eating disorders, spending, sex, excessive work … excess exercise"

2.3.2. Clinical presentations

2.3.2.1. Types of substitutes

A range of substances and behaviours served as substitutes across the included studies. Substitute addictions were primarily described in terms of a shift from the use of one substance to another (Aharonovich et al., 2005; Allsop et al., 2014; Anglin et al., 1989; Blanco et al., 2014; Brown et al., 1973; Carmelli et al., 1993; Cohen, 1981; Conner et al., 1999; Copersino et al., 2006; Cowan & Devine, 2008; Crost & Guerrero, 2012; Darke et al., 2006; De Leon, 1987; Devenyi & Wilson, 1971; Fairbank et al., 1993; Ford, 1956; Friend & Pagano, 2004; Hodgins et al., 2017; Kadden et al., 2009; Koball et al., 2019; Kohn et al., 2003; Maletsky & Klotter, 1974; Miller et al., 1983, 1990b; Murphy & Hoffman, 1993; Peters & Hughes, 2010; Petry, 2001; Schut et al., 1973; Simpson et al., 1982; Simpson & Lloyd, 1978, 1981; Sokolow et al., 1981; Vaillant, 1966a, 1966b; Vaillant & Milofsky, 1982; Verinis, 1986; Waldorf, 1970). Multiple licit and illicit substances were indicated as substitutes for

persons with SUDs. Licit substitutes were alcohol, cigarettes, coffee, high-sugar food, and prescription medication to calm and aid sleep. Illicit substitutes included amphetamines, barbiturates, cannabis, cocaine, and opioids, although what was considered illicit in one context was sometimes considered licit in another (cannabis in particular). Few publications addressed replacing a SUD with addictive behaviours (Sussman & Black, 2008; Vaillant, 1970, 1988, 2005; Vaillant et al., 1983; Vaillant & Milofsky, 1982). Behavioural substitutes for SUDs were said to be Alcoholics Anonymous attendance, gaming, hobbies, work, religion, mystical belief, prayer, and meditation.

One case study highlights the importance of vigilance among practitioners, as the substitute substance was initially prescribed for medical purposes (Buga et al., 2017), while another paper demonstrated a practitioner's tolerance for certain substitutes (Savitt, 1954). Four case studies described the replacement of substances with behaviours (Ali, 2015; Savitt, 1954; Tadpatrikar & Sharma, 2018; Young & Suler, 1996), which included: internet use; pornography use, web-series viewing and increased gaming as well as sex.

The onset of substitute addictions was common during early recovery (Çepik et al., 1995; Cowan & Devine, 2008; Murphy & Hoffman, 1993; Savitt, 1954; Verinis, 1986), during treatment, continuing (progressively) after treatment (Friend & Pagano, 2004) or beginning in the post-treatment period (Sokolow et al., 1981). Addiction history (Peters & Hughes, 2010) and withdrawal experiences (Allsop et al., 2014) were implicated in substitution behaviour. The trajectory of substitute addictions varied from portending and contributing to relapse (Aharonovich et al., 2005; Kohn et al., 2003; Staiger et al., 2013), over serving as a recovery strategy (Colder Carras et al., 2018; Cowan & Devine, 2008) to staving off relapse or maintaining abstinence from a primary substance (Vaillant, 1966b). For at least a sub-group, post-treatment alcohol consumption was found to lead to alcohol addiction or relapse to the primary substance (Staiger et al., 2013).

2.3.2.2. Presentations of substitute addictions

The identified studies revealed that persons with SUDs may employ substitute behaviours temporarily or in the long term. Temporary replacement occurred when the

primary addictive behaviour was unavailable (Cohen, 1981; McGlothlin et al., 1970; Miller et al., 1990b), for example, when unobtainable, cocaine was replaced with marijuana (Miller et al., 1990b) or during early recovery when food may serve as a replacement (Cowan & Devine, 2008). Access to and availability of the addictive activity/object to facilitate regular engagement are influential in addiction specificity (Sussman et al., 2011). Consequently, contextual factors such as changing policies (Crost & Guerrero, 2012; Moore, 2010; Subbaraman, 2016) were noted as regulating availability and access, playing a role in substitute addictions for some.

Studies also depicted long-term replacement, where one addiction functionally replaced another (Devenyi & Wilson, 1971; Savitt, 1954; Simpson et al., 1982; Vaillant, 1966a). For example, alcohol was replaced by barbiturates (Devenyi & Wilson, 1971), and heroin was substituted with sex (Savitt, 1954) and alcohol (Vaillant, 1966b). Furthermore, some replacements represented the increased use of/greater engagement in a behaviour after the primary addiction was terminated (often the 'untreated' addiction in a set of addictions; e.g. Anglin et al., 1989; Carmelli et al., 1993; Copersino et al., 2006; Schut et al., 1973; Tadpatrikar & Sharma, 2018; Verinis, 1986; Maletsky & Klotter, 1974).

2.3.3. Sample

A key finding was the lack of geographical spread of the scholarship on substitute addictions as empirical, conceptual and case studies were primarily conducted in the USA (37 out of 40, 9 out of 10, and 5 out of 9 respectively) Canada, Australia and the UK. Only four case reports originated in other countries, namely Sudan, Turkey, and India (Ali, 2015; Çepik et al., 1995; Chopra & Singh Chopra, 1932; Tadpatrikar & Sharma, 2018). Most studies (n = 34) involved participants who were currently engaged in treatment or had received treatment (Aharonovich et al., 2005; Ali, 2015; Anglin et al., 1989; Brown et al., 1973; Çepik et al., 1995; Chopra & Singh Chopra, 1932; Cohen, 1981; Colder Carras et al., 2018; Conner et al., 1999; Darke et al., 2006; De Leon, 1987; Devenyi & Wilson, 1971; Fairbank et al., 1993; Ford, 1956; Friend & Pagano, 2004; Koball et al., 2019; Kohn et al., 2003; Maletsky & Klotter, 1974; McGlothlin et al., 1970; Miller et al., 1990b; Murphy & Hoffman, 1993;

Savitt, 1954; Schut et al., 1973; Simpson et al., 1982; Simpson & Lloyd, 1978, 1981; Sokolow et al., 1981; Staiger et al., 2013; Tadpatrikar & Sharma, 2018; Vaillant, 1966a; Vaillant et al., 1983; Verinis, 1986; Waldorf, 1970; Wilkinson et al., 1969).

2.3.4. Method

The majority of the included studies employed a quantitative methodological framework. Of the 40 surveys conducted, 24 used a longitudinal and 16 used a cross-sectional design, one of which formed part of a mixed methods study. One study (Ford, 1956) exclusively examined admission and physician records. The study by Colder Carras et al. (2018) was the only qualitative study included in the review. It used grounded theory and collected data utilizing semi-structured interviews (n = 20), to explore military veterans' experiences of video game use to further their mental and behavioural health recovery. Another study employed a mixed-methods design (Cowan & Devine, 2008), in which qualitative semi-structured interviews were supplemented with the Eating Attitude Test (EAT-26) and a telephone follow-up interview five to seven months after the initial interview.

Sample sizes of the quantitative studies varied greatly from 19 to 34 653 research participants. Hughes et al. (2008) administered a telephonic questionnaire to a sample of 19 to describe the natural course of attempts to stop or reduce marijuana use without treatment. The survey revealed that abstinence/reduction did not change participants' alcohol or caffeine use. Blanco et al.'s (2014) large-scale study of 34 653 adults with SUDs concluded that approximately 13% of those who abstain from a SUD developed a new SUD.

Of the reviews uncovered by the search, one emanated from the US, one from the UK and another from Australia. In the US, Subbaraman (2016) reviewed 39 studies that empirically examined substitution/complementarity of alcohol and cannabis use. They concluded that alcohol and cannabis are substitutes and complements and that policies aimed at one substance may inadvertently affect the consumption of others. Moore (2010) examined substitution and complementarity in the UK in the context of alcohol policy in the general population. The review demonstrates that policies aimed at reducing alcohol consumption can be successful, but a significant minority of consumers are likely to substitute or

complement consumption with a range of intoxicants. In Australia, Staiger et al. (2013) uncovered 13 studies that examined the trajectory of alcohol use in recovery from other substances, establishing that post-treatment alcohol consumption may increase the likelihood of relapse to the primary substance. Additionally, a sub-group will be vulnerable to alcohol becoming their primary addiction.

2.3.5. Aetiology of substitute addictions

The self-medication hypothesis, syndrome model of addiction, gateway model, harm reduction model, relapse prevention and concept of an 'addictive personality' have been described in the development of substitute addictions.

Four studies (Brisman & Siegel, 1984; Charlton, 2005; Leventhal et al., 2010; Mansky, 1999) drew upon the self-medication hypothesis, according to which substance use functions to attenuate psychological distress (Khantzian, 2017). Substitute addictions were used to regulate moods, to avoid dysphoric feelings (e.g. inadequacy and shame; Mansky, 1999), pain or emotional threats (Brisman & Siegel, 1984) and were more likely to be used as a safer, often legally and socially-acceptable alternative (Charlton, 2005). This theory, however, has been criticized for offering little guidance for treatment and for leading to an "under-recognition and under-treatment" of SUDs (Lembke, 2012, p. 524); it has also been limited in its application to substance-related addictive behaviours.

The syndrome model of addiction, which proposes that a syndrome underlies different expressions of addictive behaviours, was employed in two studies (Odegaard et al., 2005; Shaffer et al., 2004). The syndrome arises out of multiple, interacting biological, psychological, and social antecedents, and has various expressions and outcomes. Each expressed addiction, while developing via shared aetiologies and sharing features, also has unique associated features (e.g. gambling debts in the case of gambling). The addictive disorder given primacy is that which the individual's context has allowed repeated interactions with and that has reliably yielded pleasurable experiences. Furthermore, persons with the syndrome are at heightened risk for ongoing engagement in and for developing new addictive behaviours, as indicated by patterns of relapse, substitute and co-occurring

addictions. Substitute addictions occur as "addiction is not inextricably linked to a particular substance or behaviour" (Shaffer & Shaffer, 2018, p. 150).

Two studies put forward relapse prevention as a motive for substitute addictions (Vaillant, 1988, 2005). That is, a replacement competing behaviour was regarded as central to preventing relapse to a primary addictive behaviour.

The existence of an 'addictive personality' was also used to account for substitute behaviours (Young, 1999). Persons with an 'addictive personality' are expected to display tendencies that predate and drive the development of addiction (e.g. delay discounting), exhibit characteristic thought processes and patterns of behaviour as well as substitute addictions during and/or after treatment (Amodeo, 2015). However, the theory has been criticized for lacking a generalizable evidence base and for referring to the personality characteristics that arise post- rather than pre-addiction (Amodeo, 2015). It has been argued that a partially resolved addiction, dropout from or unsuitable treatment - rather than an addictive personality - are likely to account for the appearance of addictive disorders, during and/or after treatment (Amodeo, 2015).

Finally, the harm reduction and gateway models were also offered as explanations for the appearance of substitute addictions (Sussman & Black, 2008). Harm reduction refers to substitution practices that cause less harm than the former addiction(s) (Horvath, 2006). Conversely, the gateway model postulates that substance use follows a sequential pattern from 'soft' to 'hard' drugs, such that substances replace one another in a predictable order. The gateway model is not necessarily applicable to substitute addictions, as the use of 'soft' drugs may not be terminated before 'hard' drugs are added to the repertoire. Collectively, these theories posit a wide range of internal and external factors underlying substitute addictions.

2.3.6. Prevalence of substitute addictions

Several studies did not demonstrate evidence of substitute addictions among non-treatment seekers, treatment-seekers, persons undergoing treatment for SUDs or among those who had received treatment (Darke et al., 2006; Fairbank et al., 1993; Hughes et al.,

2008; Kadden et al., 2009; Koball et al., 2019; Miller et al., 1983; Stephens et al., 2000). In studies that found substitute addictions, the prevalence ranged from 7% to 92%. In Canada, Devenyi and Wilson's (1971) investigation of barbiturate 'abuse' among 75 'alcoholic' patients found that 7% (n = 5) had substituted alcohol with barbiturates. One participant substituted heroin with (more accessible) barbiturates, later complimenting it with alcohol. A study by Schut et al. (1973) examined changes in alcohol use by 'narcotics addicts' (n = 100) in Methadone Maintenance Treatment. Of this group, 52% abstained from alcohol when they used their first drug. Drinking was immediately terminated by 58% of participants when narcotics were first used, and gradually by a further 10% when used daily. After 18 months of treatment, 38% had maintained their alcohol abstinence. Self-report was confirmed by service providers.

Nine case reports largely emanating from treatment set-tings collectively described 30 cases of substitution. For example, in the US, Savitt (1954) described the case of a 19-year-old male treated with psychoanalytic therapy over 38 months for a 'narcotic addiction'. During the 9 months leading to abstinence, the therapist identified that sex had become a substitute. In a more recent case in India, Tadpatrikar and Sharma (2018) describe a 23-year-old male's substitution of cannabis with pornography and web-series viewing and gaming.

2.4. Discussion

The current scoping review synthesized the literature pertaining to substitute addictions in persons with SUDs published from 1932 up to 2018, resulting in an analysis of 63 articles. The phenomenon has been purposefully addressed in some research and incidentally uncovered in others. This scoping review establishes the range and depth of the available literature.

A key finding was the profusion of literature from Western countries, particularly the USA, with only a few case reports from other countries, indicating a notable gap in research. Another significant gap in the available literature concerns qualitative and mixed method studies on how and why this phenomenon occurs. A third gap in the literature involves

different understandings of the concept and terms used to denote it. This problem underscores the need for more standardized terminology and a universal definition of substitute addictions to establish its conceptual boundaries. We suggest the use of the term "replacement addiction" (Rasmussen, 2015; Sussman, 2017), defined as *the immediate or gradual functional replacement of an addiction or set of addictions that have been terminated*. To ensure clinical utility and avoid trivializing bona fide addictions (Billieux et al., 2015), we caution against applying the term substitute or replacement *addiction* too loosely. The substitute should show key characteristics of an addiction, including achieving an appetitive effect, preoccupation, loss of control, and incurring negative consequences (Sussman, 2017).

Two sub-types of substitute addiction as a replacement concept came to the fore in the literature reviewed, namely *long-term replacement*, and *temporary replacement*. While temporary replacement occurred when the primary addiction was unavailable, long-term replacement occurred when one addiction functionally replaced another. Recently, Castro-Calvo et al. (2018) advanced that during periods of "forced abstinence" from a preferred substance or activity, temporary replacement may fulfil a compensatory function. However, compensatory behaviours are not only related to the abstained behaviour (Sinclair et al., 2020).

While it may emerge to be a superordinate term, we propose that substitute addictions are *not*:

1. Purposeful for treatment (e.g. Methadone Maintenance Treatment; Nicotine Replacement Therapy; medical marijuana);
2. A "fanning out" or adding to the repertoire of addictive behaviours without abstinence. Therefore, the gateway model of progression from one substance to another is not necessarily applicable, as this may occur without terminating the use of softer drugs. For example, cigarette use may precede but not necessarily abate with cannabis use; Complementary or aimed to enhance the effects or experience of another addictive behaviour (e.g. combinations of substances and/or behaviours, such as gambling and drinking);
3. Linked to a fixed time interval.

A fourth gap is a deficit in studies on behavioural addiction substitutes for SUDs. While often discussed in the writings of the recovery movement, and asserted as being responsible for the creation of other 12-step groups by persons in recovery from a substance who then developed a behavioural addiction (e.g. Overeaters Anonymous, Sex and Love Addicts Anonymous), much more research is needed on this subject (Sussman, 2017).

2.4.1. Limitations of this review

This review is subject to some limitations. First, while we adopted a broad definition of substitute addictions, we only considered substance-to-substance substitution and substance-to-behaviour substitution. Substitution can, however, also occur between behaviours and substances (behaviour to substance) or between behaviours only (behaviour to behaviour). Second, the inclusivity afforded by a scoping review posed a challenge as findings could not be compared directly across studies because of the heterogeneity of researcher assumptions about substitute addictions, goals and related methodological choices, including:

- How substitutability was operationalized (between substances and/or behaviours; as an increase, engagement to excess or change in use; whether behaviours were initiated or resumed);
- If and which diagnostic criteria were used to describe the sample (e.g. DSM-III-R, Friend & Pagano, 2004; DSM-IV, Aharonovich et al., 2005) and measure substitution (e.g. Koball et al., 2019, DSM 5; Verinis, 1986, DSM II), and whether there was confirmation of self-report (e.g. urinalysis; Peters & Hughes, 2010);
- Sample composition (e.g. treated [with a variety of treatment experiences: frequency, duration, modality, pre- and post-treatment interactions] or untreated; neither random nor representative sampling; great variation in sample size);
- Timeframe (e.g. during withdrawal or in long-term recovery) and outcome criteria used.

2.4.2. Clinical implications of the study

This review has implications for addiction service providers, recovery advocates, and researchers. Given the increasing interest in recovery-oriented systems of care and recovery ready communities (Ashford et al., 2020), better consideration of the impacts of substitute addictions for recovery support services is central to promoting stable recovery and improving the overall quality of life (QoL) of persons with SUDs.

To promote prevention and detection during the course of treatment, service providers must recognize the potential for substitute addictions to occur (Wilkinson et al., 1969), and strive to individualize treatment to the unique biopsychosocial risks assessed when eliciting a comprehensive (substance and non-substance-related) addiction history (Buga et al., 2017; Chiauzzi, 1991). To manage substitute addictions, professionals are also advised to address substitutes within the therapeutic framework (Anglin et al., 1989), and to collaboratively develop alternative coping strategies (Freimuth et al., 2008). Additionally, to ensure that the range of treatment needs that service users present with are met, comprehensive and continuing support (e.g. case management) is essential (Vanderplasschen et al., 2019). Linkage with mutual aid groups such as Alcoholics Anonymous, Narcotics Anonymous, Overeaters Anonymous, Sex and Love Addicts Anonymous, and Gamblers Anonymous is critical (Martinelli et al., 2020), especially if related substitute addictions have presented in the addiction history. Furthermore, case management enables continuity of care and the targeting of problems other than the addictive behaviour, which is likely to minimize post-treatment relapse and promote long-term recovery (Laudet, 2007). Also, it is incumbent upon service providers and recovery advocates to sensitize service users (Buga et al., 2017; Carnes et al., 2005; Chiauzzi, 1991; Peters & Hughes, 2010) to the risk of substitute addictions. Recognizing their autonomy, personal monitoring throughout recovery should be encouraged with a distinct component of treatment and promoting and planning aftercare that fosters self-reflection to identify substitution behaviours. Linkage to community resources or participation in mutual aid membership allows post-treatment monitoring of 'new' (and returning) addictive behaviours and their health and functional outcomes relative to the terminated behaviour (Sussman & Black, 2008). Such aftercare can

help to determine the threshold level when substitutes help early recovery or hinder sustained and stable recovery. Finally, it is equally important to recognize that persons seeking recovery from addictive behaviours have different treatment aspirations and goals (Neale et al., 2011) and that while abstinence may be desired, for some it may not be possible (McKeganey et al., 2004). Therefore, substitute addictions potentially present a harm reduction mechanism toward ultimately achieving abstinence (Pentz et al., 1997), or in the long-term, recovery without abstinence. Taken together, the complexity, diverse antecedents and variable trajectory of substitute addictions reinforce that there are multiple pathways to recovery and relapse.

A high priority for future research is to explore substitute addictions within the context of treatment-assisted, natural and peer-assisted recovery. Future studies in the treatment arena should also include the perceptions and experiences of addiction professionals. Further exploration of persons in sustained and stable recovery is warranted to more fully understand the nature and dynamics of substitute addictions and we recommend that qualitative and multiple methods approaches are employed. The lack of literature from low- and middle-income countries (LMICs) provides an impetus for research in these settings. We encourage researchers to engage key stakeholders that govern treatment service provision and treatment services themselves, to advocate for the uptake of findings in practice.

"Addictive behavior occurs within a social context, which can serve as a risk or protective factor. Social contexts and individuals influence one another"
(Gifford & Humphreys, 2007, p. 353).

Chapter 3

Substitute addictions in the context of the COVID-19 pandemic[2]

Abstract

The global spread of COVID-19, subsequent stay-at-home requirements, spatial distancing measures, and long-term isolation present additional challenges for persons in recovery. Using an illustrative case from South Africa, we discuss COVID-19 related pornography use through the lens of relapse and substitute addiction. South Africa is the epicentre of the pandemic in Africa and has issued an alcohol and cigarette ban. Historical examples suggest that responses to forced abstinence may include compliance and abstinence, but also seeking alternatives to the original addiction and substitution. Substitution of alternative activities/objects may provide similar appetitive effects to fill the void of the terminated addictive behaviour, temporarily or in the long term. While substitutes do not necessarily portend a relapse, coupled with isolation and reduced recovery support, they can potentiate relapse to the former or 'new' addictive behaviour. Addiction professionals should be aware of the potential for such negative impacts during and after the COVID-19 pandemic.

[2] Based on Sinclair, D. L., Vanderplasschen, W., Savahl, S., Florence, M., Best, D., & Sussman, S. (2021). Substitute addictions in the context of the COVID-19 pandemic. *Journal of Behavioural Addictions, 9*(4), 1098-1102. https://doi.org/10.1556/2006.2020.00091

3.1. Introduction

The global spread of COVID-19, subsequent stay-at-home requirements, long-term isolation, and spatial distancing measures present additional challenges for persons in recovery (Marsden et al., 2020). In South Africa, the epicentre of the pandemic in Africa, lockdown regulations have included a ban on the sale and purchase of alcohol (instituted on 27 March, repealed on 1 June, reinstated on 12 July and lifted on 17 August 2020) and cigarettes (from 27 March to 17 August 2020). Amidst state-mandated, forced abstinence (e.g. Castro-Calvo et al., 2018), there have been reports of surges in illicit trade and theft of cigarettes and alcohol (Luthuli, 2020; Mokone, 2020) and the production and (at times) fatal consumption of home-brewed alcohol (Pyatt, 2020). While a significant decline in alcohol consumption levels has been anticipated (Marsden et al., 2020), historical examples suggest that for those with addictions to nicotine or alcohol, substitute/cross addictions may emerge subsequent to compliance with the regulations or a long-term commitment to abstinence. That is, responses to forced abstinence may include compliance and abstinence, but also seeking alternatives for the original addiction and substitution. Using an illustrative case from South Africa, we discuss COVID-19-related pornography use through the lens of relapse and substitute addictions.

Substitute addictions represent the replacement of one addictive behaviour with another (Sussman, 2017). A replacement may fill the void of the terminated addictive behaviour, temporarily or in the long-term, providing similar appetitive effects. Temporary replacements can occur during forced abstinence, ending if the substitute does not serve expected functions or when the primary addictive activity/object again becomes available (Sinclair et al., 2020). A replacement/ substitute may be linked to one's addiction history and is not only related to the abstained behaviour (i.e., as a compensatory behaviour; Castro-Calvo et al., 2018); is contingent on availability and accessibility, the extent to which it yields tolerable withdrawal symptoms, and the contexts within which it is engaged (e.g., socially or alone, Sussman et al., 2011). Based on available studies, most substitution involves the exchange of substances. For example, responses to Operation Intercept, a US public policy enforced between 21 September - 2 October 1969 to control the import of

marijuana and other substances across the US-Mexico border, included abstention, decreased use and substitution (Gooberman, 1974). Substitutes, including hashish, alcohol, barbiturates, amphetamines, cocaine and heroin, were experimented with during the shortage or had been used previously (Gooberman, 1974). Similarly, responses to the Australian "heroin drought" of 2000/2001 that was characterized by increased cost, lower quality and shortages in the availability of heroin were: declining use, fewer overdoses, substitution with cocaine, cannabis, amphetamines and benzodiazepines (Degenhardt et al., 2006; Weatherburn et al., 2003) and the development of a home-grown methamphetamine market. Substances have also been substituted with compulsive behaviours such as pornography viewing (Tadpatrikar & Sharma, 2018).

A marked increase in pornography consumption has been observed during the COVID-19 pandemic (Mestre-Bach et al., 2020), as online and solo activities may be used to compensate for limited in-person social contact including partnered sex (Lehmiller et al., 2020) and/or cope with pandemic-related emotional states (Grubbs, 2020). However, the extent to which these behaviours are time-limited or enduring sequelae of the pandemic is unknown (Mestre-Bach et al., 2020). Although high-frequency use on its own is not indicative of problematic pornography use (PPU), PPU is engaged frequently (Bőthe, Tóth-Király, Potenza, et al., 2020). Some individuals with PPU will display disordered or addictive use, leading to psychological distress (Király et al., 2020), problems in romantic relationships (Szymanski & Stewart-Richardson, 2014) and sexual functioning (Bőthe, Tóth-Király, Griffiths, et al., 2020). Persons exhibiting PPU as a substitute addiction, however, may be at heightened risk of relapse. Risk factors for relapse include being disconnected from the structure, social identity and belonging provided by recovery support networks (Dekkers et al., 2020), feeling powerless (Mestre-Bach et al., 2020) and isolated when urges to use arise (Volkow, 2020). During forced abstinence, when the individual is prevented from engaging in a given activity, reverse salience may arise whereby the abstained behaviour dominates thoughts and actions and becomes the most important (Griffiths, 2005).

Compulsive Sexual Behaviour Disorder (CSBD) is defined as "a persistent pattern of failure to control intense, repetitive sexual impulses or urges, resulting in repetitive sexual

behaviour over an extended period (e.g., six months or more) that causes marked distress or impairment in personal, family, social, educational, occupational or other important areas of functioning" (Kraus et al., 2018, p. 109). CSBD is generally more prevalent in men (Kraus et al., 2018). In Bőthe, Potenza and colleagues' (2020) recent study, the CSBD-19 Scale was administered to 9,325 adults in Germany, the US and Hungary, yielding prevalence estimates of 4.2-7% and 0-5.5% for high risk of CSBD among men and women respectively. In an earlier survey by Dickenson, Gleason, Coleman, and Miner (2018) in the United States, 8.6% (7% of women and 10.3% of men) of a representative sample of adults (N= 2,325) endorsed the defining feature of CSBD, that of clinically significant emotional distress and/or impairment over a loss of control of sexual impulses, feelings and behaviours.

CSBD has high comorbidity with SUDs (Kraus et al., 2018). For example, in a South African study, 54% of persons receiving specialized treatment for a SUD screened positive for either gambling or sex addiction, or both (Keen et al., 2015). CSBD has also been associated with a lifetime history of sexual abuse, particularly among men (Slavin, Blycker, et al., 2020; Slavin, Scoglio, et al., 2020). Unprocessed childhood trauma is an often unidentified etiological factor in the development of (interconnected) addictive behaviours (Lim et al., 2020; Sundin & Lilja, 2019; Young, 1990).

Below, we present JP's illustrative case to elucidate the mechanisms of substitute addictions and, specifically, relapse during the lockdown in South Africa. Where recovery from SUDs is operationalized as a willingly maintained daily life of sobriety, citizenship and personal health (The Betty Ford Institute Consensus Panel, 2007), JP's relapse process can be traced along a series of mini-decisions: disconnecting from recovery support; attempting to sext a woman and bargaining with himself about watching pornography. While ostensibly insignificant, these decisions - collectively - facilitated relapse (Marlatt & George, 1984). Bargaining about which situations, times and objects of addiction are "permissible" for engagement is indicative of imminent physical relapse in the absence of effective coping skills (Kalema et al., 2019; Melemis, 2015).

A case study was considered the best-suited approach to the present study as it applies to and can promote understanding of real-life, contemporary, complex situations and

offers in-depth data (Krusenvik, 2016). Data were collected using three successive telephonic in-depth interviews and were subject to thematic analysis to construct a narrative account.

3.2. Case Report

JP is a 50-year-old man in recovery from an alcohol use disorder and member of Alcoholics Anonymous (AA) for 25 years. He first experienced alcohol around the age of 7, while his "drinking career" started at age 15. JP believes that alcohol changed his personality, making him less shy, enabling him to communicate and suppressing his interest in romantic relationships, which he then feared when sober. Before he began viewing pornography, early acting out involved fantasizing; reading women's magazines, stealing romance novels and visualizing the sexual content. He withdrew from family life which had been characterized by his mother's partner's violence and substance use. From ages 16 to 20, he was sexually abused by an older male. He also now recognizes "flirtatious" behaviours of older cousins as child abuse. At age 24, when his father figure advised him to "do something about" his drinking behaviour, he contacted AA and within two days had attended his first meeting. Yet, in hindsight, he identifies that for 20 years he behaved like "a dry drunk" and that "underlying issues surfaced".

When becoming sober, he desired a romantic relationship, primarily to live out sexual fantasies. However, this conflicted with his calling to become a Catholic priest and, at age 25, he entered a seminary. During his training, compulsive masturbation continued. He engaged in two relationships: one with a married female congregant and another that motivated him to terminate his training. He became a recovery assistant in 2008, drawing on his addiction and recovery career to support treatment and aftercare.

After encountering Sex and Love Addicts Anonymous (SLAA) through work, JP began attending meetings in 2019. Participation led to another "spiritual awakening" and the recognition of long-term behaviours as a sex and love addiction (struggling in relationships; choosing unavailable women; viewing pornography and masturbating compulsively). JP believes that his (pornography) "addiction was always there," but escalated with alcohol

abstinence; he equates it with "taking that first drink." That is, he viewed his sex addiction as a substitute for his alcohol addiction. How he accessed pornography changed over time: from watching DVDs to having a selection on a flash drive; Googling images and viewing websites from his phone. He resisted acquiring a smartphone until age 40 for fear of intensifying his pornography viewing. Using his phone enables him to view pornography whenever he wants and wherever he is located. Although he was "scared" initially, he now uses his phone to access content that is tailored to "fulfil" his sexual fantasies. His current girlfriend (who is having an extra-marital affair with JP) regards his pornography use as a betrayal. However, when viewing pornography, he is "glued" to his phone; "can't get enough" and is "obsessive" which is "scary" for him. He stopped viewing pornography "a few weeks before the lock-down".

The announcement of South Africa's lockdown on March 23rd, 2020 coincided with his last in-person AA meeting. Two weeks into the lockdown, JP participated in his first online AA meeting and later an SLAA meeting. However, concerned about anonymity and high mobile data costs, he stopped participation in SLAA meetings. Quarantine policies also prohibited contact with his girlfriend and JP expressed feeling sexually frustrated, lonely and "longing for intimacy." He experienced a "slip" after his request to exchange texts of a sexually intimate nature with a woman he had previously texted was declined and began bargaining with himself about watching pornography. Now, viewing more pornography than initially planned and masturbating compulsively, he describes "feeling empty, irritable, flat, tired, unable to function, having sleepless nights" and missing an appointment as a result. To establish enduring abstinence, he identifies a need to better structure his life at home during the lockdown, and to explore his child abuse and its link to his sexual fantasies.

3.3. Discussion and Conclusions

This case highlights that there may be increased susceptibility to substitute addictions due to individual (e.g. stress; coping skills; cognitive and affective responses), environmental (e.g. recovery support; access to substances and behaviours) and addiction behaviour-related factors (e.g. history and pattern of appetitive effects). While substitutes

do not necessarily portend a relapse, coupled with isolation, reduced recovery support and (negative) cognitive and affective responses to a lapse (i.e. the abstinence violation effect; Collins & Witkiewitz, 2013), they can potentiate relapse to the former or a "new" behaviour. That is, the role ascribed to the pandemic concerning a lapse (and substitution) and how relapse is framed should it occur, has implications for the maintenance and reestablishment of recovery. Unaddressed addictive behaviours in a set of addictions can hinder stable recovery or lead to relapse in the abstained behaviour. Thus, the lifelong recovery process must attend to all dynamics that heighten relapse risk (Schneider et al., 2005). Unresolved childhood sexual abuse can play an etiological role in alcohol and sex addiction and can predispose one to relapse; resolution of trauma may be needed (Young, 1990).

Substitute addictions may have emerged during the pandemic given limited access and availability to certain substances and behaviours, whereas others (e.g. those facilitated by the internet) may be attainable and endure during and after the pandemic. Not all substitute behaviours will be genuine addictions. However, it is precisely this variability in addiction trajectories that addiction professionals must be aware of during and after the COVID-19 pandemic, and its potential for escalating addictions in the absence of recovery support (and the potential continuation of co-occurring problems such as trauma). Consequently, SUD services should elicit a comprehensive (substance and non-substance) assessment, address substitute behaviours within the therapeutic framework and incorporate this information into recovery care planning and support. To ameliorate loneliness, persons in or seeking recovery should be encouraged to maintain connections to social networks via online platforms or telephone and to seek professional help during periods of loss of control or distress (Király et al., 2020). Future research should explore whether the affective and cognitive processes at work following a lapse differ in the face of a pandemic, and the resultant implications for managing substitute addictions and fostering recovery.

3.3.1. Ethics

The study was approved by the Humanities and Social Research Ethics Committee of the University of the Western Cape (Cape Town, South Africa) and was conducted in accordance

with the Declaration of Helsinki. The subject was informed about the research and provided consent for the case study.

"Drug addiction is based on the experience a drug gives a person and
the place this experience has in the person's life.
Anything that produces a comparable experience can likewise be addictive."
(Peele, 1981, p. 2)

Chapter 4

Substitute behaviours following residential substance use treatment in the Western Cape, South Africa[3]

Abstract

The dynamics of substitute behaviours and associated factors remain poorly understood globally, and particularly in low- and middle-income contexts. This prospective study describes the prevalence and types of substitute behaviours as well as predictors, correlates, and motivations associated with substitution in persons (n=137) admitted to residential substance use treatment in the Western Cape province of South Africa. The Brief Assessment of Recovery Capital, Overall Life Satisfaction scale, and an adapted version of the Addiction Matrix Self-Report Measure was completed during and post-treatment. Results indicate that substitutes were employed consciously for anticipated appetitive effects, for time-spending, (re)connecting with others, and enjoyment. At follow-up 36% of service users had substituted their primary substance(s) with another substance or behaviour; 23% had relapsed and 40% had maintained abstinence. While some service users may be especially vulnerable to developing substitute behaviours, targeted prevention and intervention efforts can reduce this risk.

Keywords: substitute behaviours; recovery; substance use; behavioural addictions; substance use treatment

[3] Sinclair, D. L., Sussman, S., De Schryver, M., Samyn, C., Adams, S., Florence, M., Savahl, S., & Vanderplasschen, W. (2021). Substitute behaviors following residential substance use treatment in the Western Cape, South Africa. *International Journal of Environmental Research and Public Health, 18*(23), 12815. https://doi.org/10.3390/ijerph182312815

4.1. Introduction

Substitute behaviours are an important aspect to be taken into account by persons in addiction recovery and the organizations and services supporting these individuals (Sussman & Black, 2008). While a universally agreed-upon definition remains elusive (Green et al., 1978), there is a longstanding recognition that other behaviours or addictions may arise while abstaining from a primary substance (Green et al., 1978; Moore et al., 1941; O'Donnell, 1964; Rounsaville et al., 1982; Selby, 1993), particularly during early recovery (1—12 months) (Chiauzzi, 1991; Murphy & Hoffman, 1993; White & Kurtz, 2006). A recent scoping review in which substitute addictions were defined as the "immediate or gradual functional replacement of an addiction or set of addictions that have been terminated", underscores that substitute behaviours may become addictions and display key characteristics of addictive behaviours (Sinclair et al., 2021, p. 692). Consequently, substitute behaviours are part of a continuum where behaviours have the potential to progress to addictive levels over time and which vary in severity. When these behaviours are a purposeful component of treatment (e.g. Nicotine Replacement Therapy; Methadone Maintenance Treatment) these should not be regarded as substitute addictions (Sinclair et al., 2021).

Following abstinence from a primary substance, compensatory behaviours may emerge due to forced abstinence (McGlothlin et al., 1970), curiosity and experimentation (Shapira et al., 2021) and when potential substitutes are available and accessible and expected to provide certain effects (Sussman & Sussman, 2011). Prior experience with (potential) substitutes may foster these expectations, as may perceptions of its safety and adverse effects (Chiauzzi, 1991; Shapira et al., 2021; Sussman, 2017; Sussman et al., 2008). (Un)consciously 'selected' substitutes may be initiated or resumed during the life course (De Leon, 1987; Friend & Pagano, 2004; Kohn et al., 2003). In treatment samples, substitution may co-occur with and continue when abstaining from a primary substance, fulfilling similar function(s) (Chiauzzi, 1991; Sinclair et al., 2020; White & Kurtz, 2006). Research findings among inpatient and residential samples point to a subset of persons with a SUD who initiate or resume the use of other substances (De Leon, 1987; Friend & Pagano,

2004; Kohn et al., 2003), substitute with behaviours including gambling, compulsive eating, and work (Vaillant & Milofsky, 1982) and/or relapse to their primary substance (Aharonovich et al., 2005). Despite the variety of treatment goals (Neale et al., 2011) and the fact that short-term substitute behaviours may be promotive of recovery (Sussman & Black, 2008), each substitute for a previous/latent addiction increases the risk of relapse (Chiauzzi, 1991; Melemis, 2015). Although relapse remains possible throughout the recovery process (Laudet & White, 2008), its likelihood is particularly high immediately post-treatment (Vanderplasschen et al., 2010) and in early recovery (Gossop et al., 2008). Yet, few studies have focused on the prevalence, correlates, and motives for substitute behaviours in the emerging addiction recovery literature.

The extant literature on substitute behaviours in persons with SUDs demonstrates varying conceptions of its onset (e.g. during or after treatment), nature (e.g. substance or behaviour), function (e.g. relapse prevention), and duration (e.g. short- or long-term) (Sinclair et al., 2021). The primary focus lies on substance-to-substance substitution (Sinclair et al., 2021), but substance-to-behaviour substitutions, encompassing DSM-5-listed disorders as well as behaviours subjectively experienced as addictions without diagnostic criteria (e.g. compulsive sex, shopping and exercise [Sussman, 2020]), have rarely been examined. Behavioural substitutes for alcohol that have been reported include compulsive work, hobbies, gambling; mystical belief, prayer, and meditation; increased involvement with religion and Alcoholics Anonymous (Murphy & Hoffman, 1993; Vaillant & Milofsky, 1982). Based on a recent scoping review, the prevalence of substitution in substance use treatment samples is estimated between 7% and 92% (despite differences in conceptualization, operationalization and sample size [Sinclair et al., 2021]). Correlates of substitute behaviours include greater severity and duration of substance use, comorbid mental health problems, younger age and male gender (Kim et al., 2021; Waldorf, 1970).

In LMICs, a few case studies have shown that pornography viewing and increased technology use can substitute for substance addictions (Çepik et al., 1995; Sinclair et al., 2020; Tadpatrikar & Sharma, 2018; Yousif Ali, 2015). LMICs such as South Africa are characterized by disproportionately high rates of SUDs driven by social, behavioural, policy

and legislative factors, but these countries face significant structural and logistic barriers and huge treatment gaps (Suasnabar & Walters, 2020; Semrau et al., 2019; Tsuei et al., 2017). Alongside the limited focus on behavioural substitutes in persons with SUDs, the literature on substitution has paid very little attention to recovery capital, which is increasingly recognized as a crucial element for initiating and maintaining recovery (White & Cloud, 2008; Best et al., 2020). Recovery capital, encompassing personal, family/social, and community resources that support recovery (White & Cloud, 2008), and QoL are important indicators of stable recovery (Best et al., 2020). Understanding its associations with substitute behaviours/addictions will inform the further development of recovery-oriented support services.

The overarching aim of this study was to determine the prevalence, correlates and motives of substitute behaviours after initial treatment among individuals with SUDs in the Western Cape, South Africa. Specific objectives included:

- To establish the prevalence and types of substitutes
- To determine the correlates of substitute behaviours
- To explore the underlying motives for substitute behaviours

Although a few recent studies have addressed this topic (Koball et al., 2019; Razjouyan et al., 2018; Shapira et al., 2021), none included the wide array of potential (substance and behavioural) substitutes considered in this study. To our knowledge, this is also the first study to empirically examine substitute behaviours in an LMIC context, i.e. South Africa. Considering the high rates of SUDs and related harm, low treatment entry, and high post-treatment relapse in this country (Degenhardt et al., 2017; Peltzer & Phaswana-Mafuya, 2018, Swanepoel et al., 2016), knowledge of the prevalence of substitute addictions and associated personal and contextual factors are essential to optimize the organization of treatment and recovery-oriented support (Sinclair et al., 2021; Vanderplasschen et al., 2010; White & Kurtz, 2006).

4.2. Materials and Methods

4.2.1. Overview

The study employed a longitudinal cohort design, with study assessments at baseline and after 3 months. The baseline study sample (n=207) was purposively drawn from a cohort of consecutively admitted persons with SUDs receiving residential treatment in five facilities in South Africa. The criteria for including these treatment facilities were full or partial funding from the National Department of Social Development; location (the Western Cape province) and delivery of a specialized, residential program for SUDs. Though these facilities were alike in their philosophy based on total abstinence and the services offered, they varied concerning program duration and capacity. Three facilities were single-gender services. Questionnaires were administered to respondents at two time points: during and following treatment. The follow-up period ranged from 63 to 294 days, with a mean of 168 days and a median of 163 days (SD=44.647). Baseline data were collected between 21 June 2019 and 16 September 2019, while follow-up data were collected between 15 October 2019 and 31 March 2020. Table 1 summarizes the main characteristics of the treatment facilities.

Table 1. Core features of participating treatment facilities

Facility	Target group	Treatment offered	Duration	Capacity
1	Adult males and females ≥ 18 years of age	Prevention, individual and group therapy Pharmacological therapy Aftercare	4 weeks (extension possible)	16
2	Adult males ≥18 years of age	Individual and group therapy Pharmacological therapy	12 weeks	30
3	Adult males and females ≥18 years of age	Individual and group therapy Pharmacological therapy	5 weeks	50
4	Adult females ≥18 years of age	Individual and group therapy Pharmacological therapy	9 weeks	30
5	Adult males ≥18 years of age	Individual and group therapy Pharmacological therapy	9 weeks	20

To be eligible, service users were required to 1) be 18 years of age or older; 2) be in treatment for a minimum of 2 weeks; 3) have signed a consent form; 4) not exhibit acute psychotic symptoms, and 5) agree to be interviewed at follow-up. In total, 207 respondents agreed to participate during the recruitment period. To receive specialist treatment in these

facilities, service users are required to present with a SUD. Written informed consent was obtained at baseline for conducting the baseline and follow-up interviews. The study was approved by the Biomedical Research Ethics Committee of the University of the Western Cape (BM18/4/13) and the Western Cape Department of Social Development (Reference: 12/1/2/4).

4.2.2. Measures

The baseline and follow-up assessments (Appendices 3 and 4) contained questions on socio-demographic background, the Brief Assessment of Recovery Capital (Vilsaint et al., 2017), an adapted version of the Addiction Matrix Self-Report Measure (Sussman et al., 2014), and the Overall Life Satisfaction scale (Cummins & Lau, 2014). Follow-up interviews contained the same measures but did not reassess demographic variables. The baseline assessment additionally comprised questions regarding substance use history (primary substance and other substances used) and contact information to enable successful follow-up. Additional questions posed at follow-up included whether the baseline treatment episode was completed and whether (and which, if any) substances had been used post-treatment. All questionnaires were translated into Afrikaans and back-translated into English. An Afrikaans mother-tongue speaker, a service provider (senior social worker) at one of the participating facilities, tested and approved the final translated version. The data were collected through interviewer-administered baseline and follow-up questionnaires, which facilitated the collection of more detailed and complex data (Meadows et al., 2003). All baseline assessments were conducted face-to-face at the facilities, while follow-up interviews were administered face-to-face (during home visits and meetings in public spaces; 60%; and telephonically; 40%). All baseline and follow-up interviews were conducted by the first author. A follow-up rate of 66.2% (n=137) was achieved. Reasons for loss to follow-up were unwillingness to participate (n=22); obsolete or incomplete contact information (n=20); failed efforts to reach respondents (n=17); being missing/whereabouts unknown (n=4); displaying acute psychiatric symptoms (n=3); being institutionalized (n=3) or death (n=1).

Demographic variables included in the study were: respondents' self-reported age (in years); gender (male/female/other); race (coded as 'Black African', 'Coloured', 'Indian/Asian' or 'White' (in apartheid South Africa, the racial categories 'Black African', 'Coloured' and 'Indian/Asian' were assigned to those denied the same benefits as 'Whites' to reinforce segregation. Their use here is only for descriptive purposes, given the importance of ongoing redress efforts); relationship status (single; in a committed relationship; married; cohabiting; divorced/separated/widowed) and whether respondents lived with a partner that used substances; their highest level of education (primary school/secondary school/post-secondary) and employment status (employed/unemployed/ prospect of employment post-treatment).

4.2.2.1. *The Brief Assessment of Recovery Capital (BARC-10)*

Abridged from the Assessment of Recovery Capital Scale (Groshkova et al., 2013), the BARC-10 (Vilsaint et al., 2017) is a 10-item measure of recovery, individual and social assets. Each item of the BARC-10 is scored on a scale from 1 (strongly disagree) to 6 (strongly agree), with higher scores indicative of more recovery capital. The BARC-10 has been found to be psychometrically sound, with good concurrent validity with the original 50-item ARC (r= 0.92; Vilsaint et al., 2017). Predictive validity has been demonstrated for ≥1-year abstinence with a cut-off score of 47 (the sumscore) (Vilsaint et al., 2017). Given the profile of the study respondents, a unipolar rather than a bipolar response format was chosen (1= not at all agree; 2= agree a little; 3= agree somewhat; 4= agree a lot and 5= agree completely), as unipolar response formats are considered less cognitively demanding (Lietz, 2010). As such, scores could vary from 10 to 50, with higher scores indicating higher levels of recovery capital. Internal consistency for the current sample was α = .75.

4.2.2.2. *The Addiction Matrix Self-Report Measure*

This 30-item measure taps various addictive behaviours through one item for each type of potential addiction (Sussman et al., 2015). Participants are asked to endorse three statements (use, addiction, and period) at baseline concerning several potentially addictive

behaviours, referring to the 14 days preceding treatment: "I used/did it before treatment" is scored on a 5-point Likert scale (0= Never/ 1= Seldom/ 2= Sometimes/ 3= Often/ 4=Very often); the statement "I was 'addicted' to it before treatment" is also scaled on a 5-point Likert scale (ranging from 0= Not at all agree/1= Agree a little/ 2= Agree somewhat/ 3= Agree a lot/ 4= Agree completely) and to specify in years and months "For how long?". Twenty-nine potential addictions were listed as response categories and a 30th item enabled an open-ended response to indicate any other substance or behavioural addiction. To understand the motives underlying potential substitution, respondents were asked in two open-ended questions why they had increased (if any) some behaviours: "Why do you think you've increased the use of other substances since leaving treatment?" and "Why do you think there's been an increase in certain types of your behaviours since leaving treatment?"

The original Addiction Matrix Self-Report Measure was adapted to include substances used in the Western Cape as reflected in treatment demand data (Dada et al., 2020). This adaptation process centrally involved persons in recovery. Revisions included refining the descriptions of what behaviours encompassed, removing items as well as integrating substances known to be used among treatment-seekers in the region. For example, the item originally worded other drugs (such as cocaine, stimulants, hallucinogens, XTC, opiates, Valium or others) was separated and detailed; rather than stimulants, crystal methamphetamine and methcathinone (CAT) were specified; LSD replaced hallucinogens and inhalants were removed. Heroin and nyaope/whoonga were exchanged for opiates and methaqualone (Mandrax) was added. Eating (way too much food each day, binge eating) was modified to include 'high-sugar foods such as chocolates' and 'purging' as well as 'food restriction' were also included. The item gambling (including slot machines, casino games, lotteries, scratch cards, online) was also modified to include betting on horse racing and sports, a legal mode of gambling known to frequently occur in the study context (The National Gambling Board South Africa, 2021). The original item sex was revised to encompass sexual activity, pornography use, voyeurism as well as online sexual activity. Candidate items were then subjected to cognitive interviewing (Drennan, 2003). As the access to service users was not permitted for these cognitive interviews, this process was undertaken with three

addiction counsellors in recovery employed at one of the residential treatment facilities. Feedback from this process informed the phrasing and refinement of the questionnaire.

4.2.2.3. *The Overall Life Satisfaction Scale (OLS)*

Increased well-being and QoL are important elements of addiction recovery, alongside abstinence, and therefore also core treatment objectives (Laudet, 2011). The OLS, as a validated 1-item measure of QoL, was administered at baseline and follow-up. The OLS measure, composed of the statement "Overall, how satisfied are you with your life as a whole?", is scored on a scale from 0 (not at all satisfied) to 10 (completely satisfied) and has been found to be a reliable indicator of QoL (Cummins & Lau, 2005).

Statistical analyses

All statistical analyses were performed using R version 4.0.4 (R Core Team, 2021); alpha was set at $p<0.05$ prior to all analyses. Descriptive statistics were generated for socio-demographic data and substance-related characteristics of the baseline and follow-up sample.

A binary logistic regression model was used to examine the impact of study attrition (n=70; 34%). Presence in the follow-up study (coded 0 = not in the follow-up, and 1 = in the follow-up) was defined as the outcome variable, while the variables gender, relationship status, living with a partner using substances and primary substance, together with the covariate age, were defined as predictors. These predictors were theoretically and empirically motivated (Cohen, 1981). The analysis revealed no significant effects between those retained and those not retained in the study. As such, there is no evidence that both samples differ concerning the predictors gender, relationship status, living with a partner that uses substances, primary substance(s), and the covariate age. Full information maximum likelihood procedures, argued to yield equivalent results to multiple imputation, were used for missing values in the remaining analyses (Lee & Shi, 2021). Three post-treatment outcome categories were constructed. Relapse was operationalized as any post-treatment use of the primary substance(s), while Abstinence referred to no use of the primary substance(s). Substitution

was operationalized as an increase in the use of a substance and/or engagement in behaviour(s) in addition to self-perceived addiction following abstinence from the primary substance(s). The decision that 'Agree a lot' or 'Agree completely' were indicative of addiction emanated from dialogues with two persons in stable recovery (41 and 26 years, respectively, and one of whom worked for participating services) and discussion within the research team. There is no universally accepted definition or terminology for substitute behaviours (Sinclair et al., 2021), but central features are that substitution may be conscious or unconscious; may involve substances and/or behaviours; that abstinence (rather than a reduction) of the primary substance(s) is necessary; that there should be an increase in the new behaviour and functional replacement of the terminated addiction and that a substitute behaviour may be initiated (newly acquired) or resumed. Two independent coders assessed all cases individually, based on these criteria. The level of intercoder agreement, calculated using Cohen's Kappa, yielded almost perfect agreement (k= .926; McHugh, 2012).

Given the limited literature on substitute behaviours, a binary logistic regression model was constructed to predict 'substitution' (objective one). Being in the Substitute Group (coded 0 = not in the substitute group, and 1 = in the substitute group) was defined as the outcome variable, while the variables gender, relationship status, employment status, living with a partner that used substances (pre-treatment) and primary substance and the covariates age, recovery capital (BARC-10 post-treatment) and QoL (OLS post-treatment) were defined as predictors. Significant effects are described using fitted values and 95% confidence intervals as described in the R packages "effects" (Fox, 2003). As the first model did not distinguish between persons who abstained and relapsed (i.e. those not in the substitute group), this can be considered a heterogeneous group - and higher within-group variance might be expected.

To examine objective two, a multinomial log-linear model via neural networks (Venables & Ripley, 2002) was fit to the data with outcome category (Abstinence/Relapse/Substitution) as the outcome variable and the factors gender, relationship status, employment status, living with a partner that used substances and primary substance and the covariates age, recovery capital, and QoL as predictors. To

facilitate interpretation of the effects, a more parsimonious model was fit to the data with outcome category as the outcome variable and the three significant predictors (living with a partner that used substances, primary substance, and recovery capital (BARC-10 post-treatment). Next, a new dataset was created with all possible combinations of the two factors [living with a partner that used substances and primary substance(s)] and the covariate recovery capital (BARC post-treatment). There were three values chosen for the scores on the BARC-10: a low score (mean value 39.58) minus twice the standard deviation (6.61), the mean score, and a high score (the mean value plus twice the standard deviation). This resulted in a dataset containing 30 data points (2 x 5 x 3) for which the model predicted membership probability. That is living with a partner that uses substances represents 2 levels (yes/no), primary substance(s) accounts for 5 levels (alcohol, crystal methamphetamine, heroin, Mandrax or other) and the 3 BARC-10 values result in 2 x 5 x 3 = 30 possible combinations (e.g. partner "no", alcohol, BARC-10 score of 6.61).

To explore objective three, open-ended, qualitative responses in the questionnaire were analyzed thematically. Results are presented as set out in the objectives of the study.

4.3. Results

4.3.1. Study sample

The study sample (n = 137) comprised 87 (63.5%) men and 50 (36.5%) women (see Table 2). Respondents ranged in age from 18 to 67 years (SD = 9.88), with a mean age of 32.1 years. Most respondents were single (51.1%) and not living with a partner that used substances (66.4%). Before entering treatment, most respondents were unemployed (47.5%). Crystal methamphetamine (56.9%) was reported to be the most widely used primary substance at treatment admission, followed by alcohol, *other* substances (CAT, cannabis, cigarettes, and cocaine), heroin, and Mandrax. That respondents often identified multiple primary substances is likely indicative of polysubstance use. However, the extent to which these substances and other behaviours were engaged simultaneously, and in which sequencing and quantity are unknown.

Table 2. Characteristics of the follow-up sample (n=137)

Characteristics	Frequency (n=137)	%
Gender		
Male	87	63.5
Female	50	36.5
Relationship status		
Single	70	51.1
In a committed relationship	35	25.6
Married	21	15.3
Cohabiting	11	8.0
Live with a partner using substances		
No	12	5.8
Yes	178	86
Employment status		
Unemployed	65	47.5
Prospect of employment	37	27.0
Employed	35	25.6
Primary substance		
Crystal methamphetamine	78	56.9
Alcohol	19	13.9
Other	18	13.1
Heroin	11	8.0
Mandrax	11	8.0

4.3.2. Post-treatment outcomes: relapse, abstinence, and substitute behaviours

In line with objective one of the study, 50 cases were found to have substituted (36.5%), 55 (40.1%) to have abstained, and 32 (23.4%) to have relapsed at follow-up. The proportion of the group sizes of the outcome categories 'Abstained', 'Relapsed' and 'Substituted' differed significantly ($\chi^2(2)=6.41$, $p < 0.041$). 'Relapsed' was defined as any period of resuming use of the primary substance(s) after discharge, regardless of duration, or proportion of the total time post-discharge. 'Abstained' corresponded to no reported use of the primary substance(s) following discharge from treatment. 'Substituted' indicated that use of the primary substance(s) had not been resumed post-treatment; that other substances were used and/or behaviours were engaged, and that there was a subjectively perceived addiction to the replacement/s as indicated by the response 'Agree a lot' or 'Agree completely' to the question of whether they were addicted to the behaviour/substance in the last 30 days.

4.3.4. Substitute behaviours

Among those reporting substitute behaviours (n=50), 21 respondents reported multiple substitutes. Leading replacements for the primary substance were love (e.g. thoughts, feelings, behaviours about love and relationships) (n=24); caffeine (e.g. coffee, or energy drinks such as Red Bull) (n=11); eating (way too much food each day and/or high-sugar foods such as chocolates; binging; purging; food restriction) (n=9); exercise (e.g. sports/extreme sports) (n=8); cigarettes (n=8); social media (e.g. Facebook, Twitter, Instagram, WhatsApp) (n=7) and religion (activities/practices) (n=7). Six persons reported work and binge-watching (e.g. TV series, movies, documentaries) as a substitute. Sex (e.g. sexual activity, pornography use, voyeurism, online), self-harm (cutting, skin picking, hair pulling), compulsive internet use (surfing the web), and online or offline gaming (e.g. PlayStation, Xbox, Wii) were only reported by two respondents. Finally, compulsive shopping (in stores; online), alcohol, and cannabis addiction was found in only three single cases.

In terms of objective two, the results of the binary logistic regression analysis revealed a significant effect of employment status ($\chi^2(2)=6.03$, $p = 0.049$) and living with a (licit or il-licit) substance using partner ($\chi^2(2)=4.28$, $p = 0.039$) on substitute behaviours. Based on the estimated effects, it was found that participants in the category 'prospect of employment' had a higher probability of being in the Substitute group ($\hat{\pi} = 0.53$, 95 % CI = [0.35, 0.70]) when compared to those employed ($\hat{\pi} = 0.25$, 95 % CI = [0.13,0.45]) or unemployed ($\hat{\pi} = 0.29$, 95 CI = [0.18, 0.42]). Participants not living with a partner that used substances ($\hat{\pi} = 0.41$, 95 % CI = [0.31, 0.53]) were more likely to be in the Substitute group than those who did ($\hat{\pi} = 0.21$, 95 % CI = [0.11, 0.38]).

The multinomial log-linear model found significant predictors for living with a partner using substances ($\chi^2(2)=6.29$, $p = 0.042$), primary substance ($\chi^2(8)=17.55$, $p = 0.025$) and recovery capital ($\chi^2(2)=8.96$, $p = 0.011$). For instance, the average predicted membership probabilities for someone living with a partner using substances are .36 to have abstained, .39 for relapse, and .26 for substitution. In contrast, for someone living with a non-using partner, these probabilities are .34, .22 and .45, respectively. These numbers suggest that one is more likely to substitute when not living with a partner using substances. Persons

using heroin and Mandrax as the primary substance had a higher probability of substituting when compared to persons who used alcohol and crystal methamphetamine as primary substances. Lower scores on recovery capital were linked to a higher likelihood of relapse, while high scores were associated with a higher probability of abstinence. The likelihood of substituting was highest for those with medium scores on the BARC-10. Aggregated probabilities are summarized in Table 3.

Table 3. Predicted membership probability for Abstinence, Relapse and Substitution

Predictor	Abstinence (n=55)	Relapse (n=32)	Substitution (n=50)
Live with a partner using substances			
No	.34	.22	.45
Yes	.36	.39	.26
Primary substance			
Alcohol	.45	.44	.11
Crystal methamphetamine	.44	.30	.26
Heroin	.20	.32	.49
Mandrax	.13	.33	.54
Other	.53	.11	.36
BARC-10 (follow-up)			
26.4	.09	.58	.33
39.6	.33	.26	.41
52.8	.63	.06	.32

4.3.5. Motives for substitution

In line with objective three, respondents' responses to the two open-ended questions of why their use of other substances and/or certain types of behaviours increased since leaving treatment revealed several underlying factors.

The most salient motives involved using substitutes consciously to replace a primary substance and for its anticipated effects (e.g. for energy; to cope; to manage cravings; n=22), for time-spending (e.g. to occupy time; due to boredom; n=16), to (re)connect with others (e.g. improved relationships; to keep contact; to receive recovery support; n=9), for enjoyment (e.g. interested in; for enjoyment or upliftment; n=8), as well as unconsciously (e.g. did not know why; unconscious process; n=8). Other reasons for substitution were availability and access which also encompassed ease of accessibility, availability of money and/or cost (n=7), and sobriety (e.g. due to a 'change from the old way of life'; n=7). Finally,

treatment-related motives included continuing/implementing a behaviour from treatment (n=4), while job-related reasons comprised having a new/more stable job or for livelihood (n=4); being influenced by others included being influenced/triggered by others (n=2) and for health improvement involved doing an activity for health improvement or because of now being capable of performing a behaviour that could not be performed in active addiction (n=2).

4.4. Discussion

Our findings indicate that substitute behaviours are not uncommon post-treatment among persons who received residential SUD treatment in South Africa and that the majority of substitutes are behaviours rather than substances. Thirty-six percent of the respondents substituted for their SUD in one way or another, while 40% were abstinent and 23% relapsed after treatment. This prevalence rate, though not directly comparable to earlier studies on substitution due to varying operational definitions, sample sizes, treatment experiences, settings and timeframes (Sinclair et al., 2021), adds to the growing evidence base on the phenomenon of substitute behaviours following treatment-assisted recovery. Substitute behaviours were diverse, comprising love, caffeine, eating, exercise, cigarettes, and social networking, amongst others, with many participants reporting multiple substitutes. That substitutes were predominantly behavioural (substance-to-behaviour-substitution) rather than substances (substance-to-substance-substitution), a category to which those who relapsed also belong, is a key finding for establishing recovery-oriented support and adds to the limited body of knowledge on behavioural substitutes for substance use.

Love emerged as the leading substitute behaviour for SUDs in this sample. Sussman (2010, p. 41), who has defined love addiction as "a constricted pattern of repetitive behaviour directed toward a love object that leads to negative role, social, safety, or legal consequences", recognizes that love may substitute for substance use. Love seemingly invokes brain neurotransmission processes similar to substance use and decreases adaptive functioning over time. SUDs are viewed by some as a "committed pathological love relationship … with a mood-altering chemical in expectation of a rewarding experience"

(Sussman, 2010, p. 34). This attachment to substance uses concomitantly hinders and replaces interpersonal relationships. While the likelihood of relapse is markedly increased by the substance use of spouses or significant others, interpersonal connections that aid recovery, constituting social recovery capital, are central to addiction recovery (Ellis et al., 2004; Flores, 2001; White & Cloud, 2008). Our results converge with that of a recent U.S. study (Sussman et al., 2021), investigating the prevalence, co-occurrence, and correlates of substance and behavioural addictions. Love also emerged as the most prevalent addictive behaviour among this younger, adolescent sample (Sussman et al., 2021). Concerns about developing a replacement addiction to love and/or sex (Zmuda, 2021) underpin the 'One Year Rule' of avoiding dating and casual sexual relationships during early recovery and in some treatment settings, for example, therapeutic communities (Matesa, 2016; Vanderplasschen et al., 2014). However, an alternative explanation may be that love is representative of service users' social support from families and broader social networks. Application of the CHIME-D (Connectedness, Hope, Identity, Meaning in life, Empowerment, Difficulties) personal recovery framework has foregrounded the importance of connectedness throughout recovery for 12-step recovery support group members (Dekkers et al., 2020; Aga et al., 2021). It has also been demonstrated that relapse risk is considerably lower when a spouse or sponsor is supportive of one's recovery process (Ellis et al., 2004). Better outcomes have also been reported for service users in relationships that are intact one-year post-treatment. However, partner-related interpersonal stressors and (perceived) substance use problems of the partner have been found to hinder recovery (Tracy et al., 2005).

A second important substitute and replacement substance was caffeine. Caffeinated beverages include coffee, tea, mixed drinks, and energy drinks (Ágoston et al., 2018). The potential for caffeine to be a substitute behaviour has long been known (Sussman & Black, 2008). In a 1986 substitution study in the US (Verinis, 1986), 56 'alcoholics' in treatment were found to consume significantly more coffee in the first month of treatment than during the six months pre-treatment. Ágoston and colleagues (2018) identified six motivational factors for the consumption of caffeinated beverages, namely alertness (eliminating fatigue,

enhancing concentration and revitalizing), habit (ritual/ routine), mood (optimizing), social (caffeinated drinks' importance in social settings), taste (linked to its flavour) and symptom management (e.g., reducing headaches and blood pressure). As caffeine produces dose-dependent symptoms, intoxication may develop with overconsumption, and withdrawal symptoms may emerge with discontinuation (Pohler, 2010). Its psychostimulant properties lead some to become psychologically and physiologically dependent on caffeine (Addicott, 2014), as reported by 11 respondents in our study and as suggested by the inclusion of caffeine in the DSM-5.

Food, another prominent substitute in the present study, has been found to differ in its function depending on the stage of recovery. In the U.S., Cowan and Devine's (2008) interviews with 25 males in drug and alcohol recovery found that during the first six months food (particularly sweets and 'junk' food) was used as a substitute to control moods, lessen boredom, satisfy cravings and structure days. In Months 7-13 of recovery, the few that used food as a substitute did so to alleviate boredom and/or to satisfy food cravings. During the later stages of recovery (Months 14-36), food was no longer a substitute.

Exercise has been recognized previously as a potential substitute behaviour (Tadpatrikar & Sharma, 2018). From an addictive behaviour standpoint, exercise is complex to conceptualize and should be distinguished from healthy exercise, which can share attributes with addiction. Exercise addiction may be present as a primary (the main problem) or secondary (as a consequence of a primary problem) symptom (Freimuth et al., 2011). Freimuth, Moniz and Kim (2011) distinguish between recreational exercise, at-risk exercise, problematic exercise, and exercise addiction according to the motivation for exercising, consequences, and frequency/control. At the point of exercise addiction, the frequency and intensity of exercise continue, the pleasure diminishes, and the behaviour is motivated by avoiding withdrawal symptoms to the impairment of daily functioning and the ability to meet role obligations. Service providers at treatment facilities for SUDs have been cautioned to be aware of the potential of exercising to become addictive, as it may be recommended for its mood-altering effects. Exercising engaged for relieving withdrawal symptoms, as has been reported for cocaine, may open the way for an exercise addiction (Freimuth et al., 2011).

Cigarette smoking has been linked to relapse (Weinberger et al., 2017) and smoking cessation often has a positive effect on long-term substance use outcomes. Therefore, smoking cessation advice should be offered to those in treatment for SUDs (McKelvey et al., 2017). However, service users and staff frequently smoke cigarettes at treatment services, and treatment programs often do not address tobacco use (Baca & Yahne, 2009), or consider smoking as a secondary concern (Shu & Cook, 2015). In Friend and Pagano's (2004) study of changes in smoking status during and following substance use treatment, 15% of their sample of 387 persons with alcohol use disorders had initiated smoking during the 12-month follow-up period, often beginning during and increasing significantly after treatment. There have, however, been calls for smoking to be denormalized in SUD treatment settings (Schroeder & Morris, 2010). Tobacco products may also be used as a coping strategy for withdrawal symptoms experienced during or after SUD treatment (Sussman & Black, 2008) or one tobacco product may be used to substitute for another. For example, in a recent study (Tokle & Pedersen, 2019), a subgroup of former daily smokers were found to use e-cigarettes for smoking cessation. Other motives included managing nicotine addiction, and avoiding health risks and smoking-related stigma. All participants preferred e-cigarettes over nicotine replacement therapy.

The finding that those with lower recovery capital have a higher probability of relapse is an important component of conceptualizing relapse vulnerability. According to White (2002, p. 30), "most clients entering addiction treatment have never had much recovery capital or have dramatically depleted such capital by the time they seek help". The positive association between recovery capital scores and substitute behaviours may relate to the availability of human recovery capital and the capacity to apply (alternative, adaptive) coping skills and solve problems in the context of high-risk situations (White & Cloud, 2008). Treatment intends to build recovery capital by addressing needs that could be detrimental to recovery early on (Cleveland et al., 2021).

In terms of socio-demographic factors, those with the prospect of employment had a higher probability of substituting as compared to the employed or unemployed group. One interpretation of this finding could be that having the prospect rather than a guarantee of

employment leads to insecurity and stress, prompting substitute behaviours for anticipated effects. Employment is an important need to address and the substance use—employment relationship is complex and reciprocal (Henkel, 2011; Laudet & Humphreys, 2013; Richardson & Epp, 2016). Substance use may negatively impact the return to work or maintenance of a job, while employment may positively or negatively impact substance use behaviour (Henkel, 2011; Richardson & Epp, 2016). As Becker and colleagues (2005, p. 335) note: "unemployment is extremely stressful, but employment can be stressful too". Unemployment is a significant risk factor for substance use and increases the risk of relapse post-treatment (Henkel, 2011). South Africa's high rates of unemployment limit prospects of becoming employed (Naidoo, 2021), particularly post-treatment. On the other hand, employment may be associated with stressors, cues and cravings, new peers who may apply pressure to use substances and greater disposable incomes. These factors also relate to the present study's finding that the availability of money and/or the cost associated with a behaviour as well as the influence of others are motives for substitution. Alongside these potential issues for relapse and substitution, however, it is crucial to acknowledge that employment potentially enhances self-efficacy and social integration, and consequently lowers relapse risk (Graham, 2006).

4.6. Implications and Limitations of the Study

As a goal of substance use treatment is to build (multi-faceted) recovery capital, it is incumbent upon service providers to identify specific needs that may benefit from intervention and to tailor treatment protocols and assessments to service users' needs. Given that risk or vulnerability is not static, it is imperative for service providers to modify treatment plans and to distinguish the strategies used during early and later treatment stages (Buga et al., 2017; Chiauzzi, 1991; Flores, 2001). An indispensable component of resolving substitute behaviours is for service users to be sensitized to the possibility that they may arise and that they are equipped to identify if and when further support may be warranted (Buga et al., 2017; Carnes et al., 2015; Chiauzzi, 1991). The salience of substance-to-behaviour-substitution highlights that those treating SUDs must be aware of former or future

behavioural addictions. Service providers should also be prepared to address behavioural addictions at treatment entry, especially among persons who have relapsed and/or re-entered treatment. As we have discussed elsewhere (Sinclair et al., 2021), substitute behaviours do not necessarily foreshadow a relapse. Substitute behaviours may be an intermediate step towards recovery (see Horvath, 2006), particularly during early recovery (White & Kurtz, 2006; Sussman & Sussman, 2011). Yet, the nature of the substitute behaviour and motives are important to consider in terms of its risk of leading to similar or greater harm, relapse and/or the development of another addiction (Horvath, 2006; Moore, 2010; White & Kurtz, 2006). As Freimuth and colleagues (2008, p. 151) caution "any substance or behaviour that is reinforcing, used to cope, or provides robust and desired changes in experience has the potential to become an addiction." This functional replacement role of substitutes has long been recognized (Sussman & Black, 2008).

While the current study overcomes shortcomings of earlier empirical work on substitute behaviours, results should be considered in light of some limitations. First, the study was conducted in one geographical area in South Africa and the sample size was relatively small. Though longitudinal studies are critical for studying substitute behaviours, attrition is an established methodological concern. Relapse and substitution itself may be associated with loss to follow up (Kim et al., 2021). Second, the end of the follow-up data collection period coincided with a stringent lockdown to contain the COVID-19 pandemic, including a blanket ban on the sale and purchase of cigarettes and alcohol, which is likely to have contributed to altered patterns of use and acquisition, and for some to seek alternatives for the original addiction and substitution (Sinclair et al., 2020). Other possible confounding variables include access to alcohol, though this was reported as a substitute by only a minority of respondents. Third, as data were self-reported, they could be subject to recall and social desirability biases. However, a key strength of the study is the rapport established between the primary researcher and respondents. While appointments often had to be rescheduled on multiple occasions, every effort was made to interview participants where they felt most at ease and had privacy, and in the case of telephonic interviews, when they were most likely to be able to take a call privately so as to feel unconstrained. Respondents

were thus able to disclose and detail the dynamics of post-treatment experiences with substances and behaviours more freely while augmenting the methodological rigour of the study. Finally, as our operationalization of substitution required that there was an increase in use or engagement as well as perceived addiction, the range and prevalence of substitutes detected may have differed with another operationalization.

To extend the scientific knowledge base on substitute behaviours as it pertains to treatment-assisted recovery, longer-term follow-up studies should be conducted to establish the trajectory of substitute behaviours. While it is clear that research has been conducted on substitute behaviours over the past decades, there is an urgent need for a framework to unify, systematize, and improve its (variable) quality and to better inform research translation, particularly in LMICs. We also recommend conducting qualitative research into the perceptions and experiences of addiction professionals. Integrating the views of service users and service providers is essential for relevant and responsive treatment.

4.7. Conclusions

Substitute behaviours are a known outcome for some following substance use treatment and targeted interventions may impact its onset, course and outcomes. Service providers should be aware of the risk factors for substitute behaviours, which could aid in identifying service users at high risk and modifying treatment accordingly, such as taking a comprehensive (addiction) history, educating service users and their support networks, and being aware that substitute behaviours may emerge within treatment settings.

Chapter 5[4]

Service providers' perceptions of substitute addictions in the Western Cape, South Africa

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Abstract

Given their prevalence and potential impact of substitute behaviours, service providers need to address substitute behaviours and addictions adequately during substance use treatment. Yet, globally little is known regarding substance use service providers' perceptions of substitute behaviours and this significant gap could potentially hinder service provision and recovery outcomes. Semi-structured focus group discussions (including 22 service providers across 5 facilities) were conducted in residential treatment facilities in the Western Cape, South Africa. All service providers were familiar with the concept of substitute addictions, and recognised substances (e.g. cigarettes and caffeine) and behaviours (e.g. gambling, eating, love, sex, shopping, exercise and gaming) as potential substitutes. Substitute motives that were identified included managing cravings; self-medication; masking feelings and emotions; filling the experiential void of the primary substance; time-spending; social acceptance, legality and/ or familial endorsement of the substitute. Concurrent addictions were a key mechanism underlying substitution: service users may present with co-existing behaviours and identify one as a primary addiction to be treated. While substitution mechanisms were identified, service providers did not uniformly screen for co-occurring behavioural addictions during intake. Substitute behaviours were primarily considered a pathway to relapse and service providers emphasised prevention, detection and education of the family. To suitably intervene, assess and treat service users, evaluation for the presence of behavioural addictions should be an integral part of the assessment of those presenting for substance use treatment.

Keywords: substitute behaviours; recovery; substance use; behavioural addictions; service providers

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5.1. Introduction

Studies published over the past several decades indicate that a substantial number of individuals with SUDs develop substitute behaviours during recovery: behaviours and/or substances that replace the functions of terminated addictive behaviour(s) (Sussman, 2017). Emerging literature identifies an array of underlying motives, mechanisms, and presentations of substitute behaviours. Substitute motives include curiosity and experimentation, outcome expectancies, time-spending, being influenced/triggered by others and availability, accessibility, and prior experience with (potential) substitutes (Sussman & Black, 2008; Sussman & Sussman, 2011; Sussman et al., 2011; Chiauzzi, 1991; Shapira et al., 2021; Sinclair, Sussman, De Schryver et al., 2021). In terms of the process by which a substitute addiction may occur (mechanisms), substitute behaviours may develop from being a previously co-occurring addictive behaviour, they may precede a primary substance and re-emerge after its termination, or, may constitute 'novel' behaviours arising during recovery (Chiauzzi, 1991; White & Kurtz, 2006; Sinclair, Vanderplasschen et al., 2021). Substitute behaviours occur on a spectrum of duration, severity and relapse risk (Sinclair, Sussman, Savahl et al., 2021). Despite the known high risk of relapse immediately post-treatment and the association between substitution and poorer treatment outcomes, many questions remain unanswered concerning the dynamics of substitute behaviours (Vanderplasschen et al., 2010; Kim et al., 2021; Shapira et al., 2021; Sinclair, Sussman, Savahl et al., 2021; Sinclair, Vanderplasschen et al., 2021). Views on the outcomes of substitute behaviours differ: some hold that substitute behaviours heighten relapse risk or signal impending relapse (Chiauzzi, 1991; Selby, 1993; Melemis, 2015; Rasmussen, 2015), while others contend that substitutes potentially facilitate recovery (Horvath, 2006).

The role of treatment in recovery from SUDs has been debated, but studies indicate that persons who participate in treatment do better than those who do not and that residential treatment yields better outcomes as compared to outpatient treatment, particularly for those with severe and lasting/complex problems (Vanderplasschen et al., 2010). Further, as demonstrated within the psychotherapy arena, the therapeutic alliance and bond with counsellors/service providers are more predictive of treatment outcomes than

any other treatment-related determinant (Norcross & Lambert, 2019). Service providers play an influential role in the outcomes of treatment-assisted recovery arising in part from factors such as professional characteristics, compliance with protocols, alliance, treatment beliefs, and professional practice issues (Najavits et al., 2000). Other important factors include providers' treatment philosophy, conceptualisations of addiction and lived experience of addiction and recovery (Barnett et al., 2018; Taxman & Bouffard, 2003; Sung et al., 2009; Novotna et al., 2013). Service providers are afforded considerable discretion in how they assess and intervene with service users and have to make complex daily treatment-related decisions (Stokes, 2019). In the literature, a variety of related clinical practice recommendations on substitute addictions have been formulated targeted at service providers and these primarily concern relapse risk mitigation (Chiauzzi, 1991; Buga et al., 2017; Carnes et al., 2005; Peter & Hughes, 2010; Freimuth et al., 2008; Sinclair, Sussman, Savahl et al., 2021; Sinclair, Sussman, De Schryver et al., 2021; Sussman & Black, 2008). These recommendations are:

- charting a comprehensive (addiction) history and biopsychosocial risk assessment for substitutes at admission and regular intervals;
- tailoring and modifying treatment to attend to substitute behaviours;
- sensitizing service users as to the potential for substitute behaviours;
- collaboratively strengthening recovery capital to limit harms of substitution, and
- encouraging self-monitoring and utilisation of recovery support to prevent, detect and manage substitutes

Although these recommendations may help to advance treatment and substance use interventions, little is known about treatment professionals' views on substitute behaviours and how to address these during treatment. Given that service providers are afforded considerable discretion and treatment-related knowledge and experiences accumulate in recovery trajectories, knowledge of their conceptions, theories and responses to substitute behaviours enables insight into current strategies and clinical realities. Simultaneously, engagement with service providers will elucidate areas that are essential for workforce development efforts and relevant and responsive treatment.

Given the limited resources in LMICs and the increased relapse risk among persons who substitute, it is important to address this topic among treatment professionals. A recent study in South Africa demonstrated that almost one-third of service users developed substitute behaviours during the initial months after residential treatment (Sinclair, Sussman, De Schryver et al., 2021). The purpose of this study is to explore substance use service providers' perceptions of substitute behaviours during and after residential treatment in the Western Cape, South Africa. To our knowledge, this is the first study to explore service provider perceptions of substitute behaviours in South Africa and LMIC SUD treatment settings.

5.2. Methods

As part of a broader multiple methods study on the nature and dynamics of substitute addictions, this study employed an exploratory, qualitative design to report on service providers' perceptions based on five focus group discussions. A qualitative methodological framework is well-suited to meet the aims of the study, given the in-depth, insiders' understanding of phenomena it affords (Gelo et al., 2008). A comparative advantage of the focus group discussion method is that moderators can quickly ascertain the spectrum of participant perspectives and, through group interaction, the personal views of participants can be elucidated and expanded upon (Powell & Single, 2006). The focus groups were guided by a semi-structured schedule (Appendix 4) focused on understandings of substitute addiction, experiences of delivering treatment concerning substitute addictions, and recommendations for clinical practice.

5.2.1. The setting of the study

The study was completed in the Western Cape, one of the nine provinces of South Africa. With an estimated 7 005 741 inhabitants in 2020, 11% of South Africa's population, the Western Cape constitutes the third-largest province by population (Statistics South Africa, 2020). In the first half of 2020, 1 323 (21% of all admissions across 31 out- and inpatient treatment centres) persons were admitted to substance use treatment in the

Western Cape. The most commonly reported primary substances at treatment entry were crystal methamphetamine (44%), cannabis (23%), heroin (18%) and alcohol (10%) (SACENDU, 2021). Two systems of care exist for addressing SUDs: treatment services in the for-profit private sector and those fully or partially funded by the government (Myers et al., 2008). Access to state-funded residential treatment necessitates referrals, which are primarily made by social services (Isobell et al., 2015; Burnhams et al., 2012). These facilities' treatment policies reflect a disease-model orientation. The National Drug Master Plan (2019 - 2024; Department of Social Development, 2020), which governs service provision throughout the country, has identified the need to increase harm reduction services within substance use treatment, as these are presently lacking (Department of Social Development, 2020; Scheibe, et al., 2017). Yet, although prevention, post-treatment aftercare and reintegration services facilitate recovery and support the gains of treatment, they remain limited in South Africa (Cowley, 2011; Isobell et al., 2018). Treatment services are delivered by multidisciplinary teams, comprising social workers, occupational therapists, (psychiatric) nurses, recovery assistants, and psychologists.

5.2.2. Participants and sampling

Study participants were purposively selected from five inpatient treatment facilities in the Western Cape. The inclusion criteria for these sites were full or partial funding from the National Department of Social Development, location (the Western Cape province), and delivery of a specialized, residential programme for SUDs. Though these facilities were alike in their total-abstinence philosophy and offered many of the same services, programme targets, duration and capacities vary. Table 1 provides an overview of the core features of participating treatment facilities.

5.2.3. Procedure and ethics

The study was approved by the Biomedical Research Ethics Committee of the University of the Western Cape (BM18/4/13) and the Research Ethics Committee of the

Western Cape Department of Social Development (Reference: 12/1/2/4). Permission to interview service providers was sought from treatment centres recruited into the larger study. Each prospective participant was informed of the purpose of the research and was free to consent to participate. Participants were assured of confidentiality, the voluntariness of the research and their right to withdraw at any stage.

Table 1
Core features of participating treatment facilities

Facility	Target group	Treatment offered	Duration	Capacity
1	Adult males and females ≥ 18 years of age	Prevention, individual and group therapy Pharmacological therapy Aftercare	4 weeks (extension possible)	16
2	Adult males ≥18 years of age	Individual and group therapy Pharmacological therapy	12 weeks	30
3	Adult males and females ≥18 years of age	Individual and group therapy Pharmacological therapy	5 weeks	50
4	Adult females ≥18 years of age	Individual and group therapy Pharmacological therapy	9 weeks	30
5	Adult males ≥18 years of age	Individual and group therapy Pharmacological therapy	9 weeks	20

5.2.4. Data collection

Five focus group discussions were conducted on-site at residential treatment facilities by the lead author between 19 June and 16 August 2019. Sessions were conducted in English and/or Afrikaans, were audio-recorded, and lasted between 49 and 90 minutes. Focus groups comprised 2 to 6 service providers (n=22), depending on staff availability and leave arrangements. Discussions were guided by a semi-structured interview schedule (Appendix 3), in which pre-determined as well as unplanned questions were posed to interviewees about their understanding of substitute addiction, related experiences of delivering treatment and recommendations for treatment services (DiCicco-Bloom & Crabtree, 2006). All staff actively involved in the delivery of the respective programmes received an invitation to participate. The job titles assigned to service providers were not uniform across facilities

although similar functions were served. A description of the participants is provided in Table 2.

Table 2
Description of participants

Focus Group/ Facility	Participant (n=22)	Gender	Title	Years on staff	Lived experience of addiction and recovery
1	1	Female	Social worker	2 years	No
	2	Male	Recovery assistant	>10 years	Yes
2	1	Female	Social worker	13 years	No
	2	Female	Social worker	4 years	No
	3	Male	Care supervisor	4 years	No
	4	Female	Psychiatric nurse	10 years	No
3	1	Male	Caregiver	11 years	Yes
	2	Female	Programme manager	14 years	No
	3	Female	Social worker	6 years	No
	4	Male	Chaplain	3 years	No
	5	Female	Social worker	<1 year	No
4	1	Female	Staff nurse	3 years	No
	2	Female	Social worker	3 years	No
	3	Female	Occupational therapist	3 years	No
	4	Female	Child and youth care supervisor	3 years	No
	5	Male	Child and youth care supervisor	3 years	Yes
5	1	Female	Social worker	1 year 7 months	No
	2	Female	Social worker	29 years	No
	3	Female	Occupational therapist	13 years	No
	4	Female	Social worker	1 year 10 months	No
	5	Female	Social worker	10 years	No
	6	Female	Social worker	4 years	No

5.2.5. Data analysis

Data were analysed using theoretical thematic analysis (Braun & Clarke, 2006). The first stage of the analysis entailed the third and the first author transcribing the audio recordings of focus group discussions in full. To further become acquainted with the data, both authors read the transcripts to derive a global understanding of the texts. Thereafter, the transcripts were reread and, with the research question in mind, first-level codes were assigned independently. The codes were then re-examined to identify patterns in

participants' experiences. Through an iterative process, themes and sub-themes were formulated. This dual-coder analysis simultaneously refined the themes derived and enhanced study validity. Finally, the themes were framed by the extant research literature.

5.3. Findings

The focus group findings demonstrate that the concept of substitute addictions was known to all service providers. Participants shared various definitions of substitute addictions, outlined a range of underlying motives and mechanisms and discussed substitution in relation to recovery, relapse and neurobiology. Therapeutic responses emphasised prevention and detection, and the importance of including the family.

5.3.1. Definitions of substitute addictions

All service providers, three of whom had a personal history of addiction and recovery, were familiar with the concept of substitute addictions, and recognized substances (e.g. cigarettes and caffeine) and behaviours (e.g. gambling, eating, love, sex, shopping, exercise and gaming) as potential substitutes. Others stated that persons with SUDs substituted to pursue the same or similar appetitive effect provided by the primary addiction; to satiate a craving; to alter a feeling state; or due to the perception that the replacement behaviour is less harmful. Substitutes may immediately or gradually replace the primary addictive behaviour.

Service providers indicated that substitute behaviours functionally replace the original addiction and are used for an expected outcome.

> *Replaces the main addiction […] giving me the outlet of feeling something other than what I am feeling at the moment […] Replacing the initial addiction with something that also creates that endorphins in your brain or that thrill-seeking behaviour.* FGD 1

> *I think any experience that would trigger the emotion that you could possibly crave, or that you need and then becomes a craving.* FGD 2

Service providers outlined possible presentations of substitute behaviours. In one presentation the 'primary' addiction in a set of addictive behaviours may be terminated while a 'secondary' escalates. Substitutes may be substances within the same drug class or

different activities. Substitutes may be employed deliberately to replace an inaccessible addictive behaviour, or if perceived to be less harmful. Substitute behaviours may also be used to fill the experiential void of the terminated behaviour. Use of the replacement substance may initially be legitimate, as in the case of a prescription for pain management, but over time may become problematic. Insight concerning the substitute may develop at a later stage.

> *All of a sudden, they start exercising, so they stop drinking but now they exercise to the extreme. Or […] somebody who was on heroin substitutes it with maybe painkillers […] So it might be they were an alcoholic and then they are in an accident […] then the doctor prescribes something like Tramadol and then after a while they start realising that they're misusing the script […] my mind used to be occupied by this one thing. So, to keep my mind occupied while that's gone I could fill with something else. […] It may be, people feel that it is safer, better or less harmful.* FGD 3

> *If I don't have the one I will find something else. To give me the same effect. More or less the same effect.* FGD 5

5.3.2. Substitute motives

According to service providers, substitutes may be used to mask feelings in the same way that the primary addictive behaviour did. Or, in pursuit of activities that are positive for recovery, someone may experiment with different activities to fill the experiential void left by the primary addiction. There may not always be an awareness that the replacement could potentially become problematic.

> *The same thing with your addiction: you're masking your feelings and emotions […] trying to fill this gap […] It's such a part of your life, that when we take it away, that life is so empty […] And that is where it starts like, you can eat, you also gamble […] Because now you're looking for things to be clean and sober to be in recovery, but at the same time you don't know what you're adding could potentially also […] Become your new thing. But it's the seeking, what am I going to do now?* FGD 1

Whereas a primary substance may provide preferred acute effects, a secondary substance may simply be part of the repertoire to achieve intoxication when desired. The legal status of a substance and acceptance by the family may also reinforce use.

> *The primary drug is the one they will always return to and they would do anything to procure […] With the secondary drug, it is more about 'I just want to use something' […] Sometimes, when people leave an illegal drug they might substitute with something that's legal because their family also still uses alcohol […] we've had quite a few patients, they would leave tik (crystal methamphetamine) […] and the wife allows the husband still to drink alcohol.* FGD 2

According to service providers, substitutes may be motivated by guilt and trying to compensate for role impairment during active addiction. Some service users may initiate smoking during early recovery. Or, 'healthy' and 'productive' behaviours such as work or exercise may become a central focus, to the neglect of recovery support activities. Should these positive behaviours become unmanageable, a substance such as caffeine may be used for its effects, to cope. This 'unbalanced' life was likened to life in active addiction.

> **Interviewee 5:** *People would push it to the extreme, so much so […] that they would start neglecting their aftercare […] because they were either going to the gym or hiking […] or […] working an extra shift […] because they see it as productive or as healthy - they don't see it as a substitute […] or they would start smoking cigarettes. When they never smoked […]. Because it's legal […] they rationalise it […] it's healthy […] it's for my family.*
> **Interviewee 2:** *[…] in the past I didn't pay my maintenance' […] 'now I have to work overtime […]*
> **Interviewee 4:** *As they get into their new thing […] it starts to take its toll, they start picking up things […] to try and cope. […] working extra-long shifts then […] lots of caffeine.* FGD 3

Our respondents also commented that food may be used to manage cravings for the terminated primary substance. Substitution with food was said to be particularly challenging to address as it is necessary for survival, and active addiction was characterised by food deprivation.

> *They will have cravings […] That's why they eat […] especially because you need food to survive […] it's such a dangerous substitute. Because when is enough ever? And it's difficult to determine because […] you never ate because you were using meth and […] Now […] your appetite is coming back. So, do you stop them? Or do you let them catch up?* FGD 3

The preferred substitute may be found after experimentation until the desired effect is achieved or, by replacing a previously used substance when it no longer provides the desired appetitive effect.

> *It might not necessarily be the more acceptable one. Because I could be starting out with cannabis and eventually end up with tik. We often see that. […] 'I've tried it, it just doesn't do it anymore. I add Mandrax. I don't like it at all. Let me try something else'.* FGD 4

As service users may not derive enough pleasure from prosocial activities, they may seek out other activities. Service users may also be prompted to start a new relationship with a fellow service user.

> *It's important to understand dependency medically, behaviourally, everything in one. You can't just address the substance […] dependency is all about the dopamine […] So they still don't find*

enough pleasure with family time, or, constructive free-time activities. They still seek other things. FGD 5

Love - we see that fairly often - or, what they think love is: relationships […] Inside […] they fall in love so quickly and one asks them 'how long have you known each other?' 'A day'. 'And you love this person?' 'Yes!' Obviously, an addiction has a lot to do with dopamine and […] anything that they think lets them feel a bit better […] we see love (as a substitute) a lot, first. Because they can experience love here. FGD 5

Religion, except for instances where service users became 'obsessive', was one of the only 'positive' substitutes identified. Engagement in religious activities may be to occupy their unstructured time.

Sometimes patients that get very religious. One or two may be obsessive. Some others […] it might be something to fill up their days and their free time and their Sundays. To go to church, they want to go and do motivational work in their communities and – which is then positive but what we usually say is don't have too many goals when you walk out of here. FGD 5

Substitutes may also be used to self-medicate when the function of the primary substance was self-medication.

Sometimes our patients self-medicate when they actually need Ritalin ® or Concerta ® then they use tik. For other people it would make them active, makes them calm down their brains. So sometimes it is self-medication that causes them to use due to an illness like ADHD. FGD 5

5.3.3. Mechanisms of substitute addictions

Participants identified various mechanisms (interplay among addictions over time) by which substitute addictions may arise in service users presenting to treatment. One mechanism underlying substitution may be that service users have co-existing behaviours of which one is identified as a primary addiction to be addressed in treatment. The concurrent behaviour, which may have complemented the primary addiction, then stands to grow to the strength of an addiction.

Now that you stop using drugs, when you go back to gambling now they highlight that as a warning sign […] It was fine all the time because that's not really the addiction. But when they stop using drugs, it does become because now it escalates […] You just left your drugs and sex has now become the primary thing […] It was always there, it was a secondary. […] Drug use and the sex maybe went hand in hand. FGD 1

However, if a service user did not regard their concurrent behaviour as problematic, it may be disclosed at a later stage of treatment. Service users may also minimize a coexisting

addiction and when the full extent of it is known, it may emerge as more severe than the identified primary substance.

> *I have two patients currently that both only mentioned to me their gambling use quite (sigh) in like session number five or so. […] they don't think it's a problem, at all. […] one patient, the longer I spoke to him, the more it became clear that he has had so much debt […] and other problems that might have been even worse than his alcohol use […] I first told him 'but you stop that use as well' and I spoke, explained why – he came back the next week and said: 'so I stopped my gambling but I'm going to gamble on Friday because it's Durban – July (a horse race held annually in July) […] Yes, in the past I've had debt but I don't have a problem.* FGD 5

Service providers contended that service users' belief that they did not have to abstain from mood-altering substances that were unproblematic previously, may be another mechanism by which substitutes arose. In still other cases, the substitute may arise from multiple addictions that alternate such that one comes to the fore periodically.

> *That's very common if they come in for […] a methamphetamine addiction, when they go back, because 'my drinking was never my problem' […] they don't understand the fact that they have to abstain from everything, they think that 'okay I'm just here for this one drug and that's the one that has caused the most problems in my life'. […] Sometimes they have more than one addiction. It's like porn or gambling, so they chop and change.* FGD 3

Alternatively, the family may unwittingly facilitate a substitute addiction by providing access to licit substances such as medications.

> *We had a role model client. […] One day I […] asked the mother how he was doing. He was 'doing quite fine', 'staying indoors the whole day' […] didn't have a job. […] 'what is your son doing now?' 'No, he's in his bedroom playing the Xbox all the time'. […] He's coming to ask for painkillers and then he goes back to his bedroom' […] So in her mind, her boy was still sober. But […] he was doing drugs indoors. All the time.* FGD 2

Another presentation entails the initiation of a behavioural addiction after abstinence from a primary substance. For some, the behavioural addiction that replaces a primary substance-based addiction may also have been engaged previously. The reward derived from the activity may incentivise continued use, and, while this replacement may not have been intentionally sought it may become an addiction.

> *I come to rehab and then I stop using tik, but I start gambling […] a different activity entirely. […] They might have done gambling in their lifetime. […] It was a rewarding activity. I won money […] It felt good […] It's something that I've been doing casually and continue using and doing […] The process of addiction takes place. […] I don't think people purposefully look for a substitution for their addiction.* FGD 4

5.3.4. Substitution and Neurobiology

Participants expressed that service users were accustomed to using substances as a maladaptive coping mechanism when faced with difficulties. The default response, when faced with a challenge, would thus be to use a substance.

> *Although I have all of these coping skills, […] remember that your brain is still wired to resort to that. So, the first action that comes to my mind, if I can't deal, if I can't cope, my outlet is to use. This is from an addict point of view.* FGD 1

Consequently, one argument was that as the substitute behaviour leads to dopamine surges in the brain akin to the primary substance, it maintained the conditioned brain response. Substitute behaviours were thus inherently negative as they maintained addiction.

> *It maintains the conditioning process. And it remains in the thoughts, if the brain was rewired it will remain in […] the reward pathway system […]*
> **Interviewer:** *You all said: no, it can't be a positive thing.*
> *Because it's a recurring relapsing disease. […] You remain addicted […] Recovery is a life-long process.* FGD 2

Citing its neurobiological bases, some service providers regarded substitution as an inevitably unconscious and automatic process.

> *Your brain, because it now starts to fire in that same sequence again, because you are eating or exercising. Dopamine is released […] it's not a conscious choice. […] Your brain chemistry was telling your body. […] I feel normal now. I feel I can cope now.* FGD 4

Neurobiology was also implicated in service users' vulnerability to potentially addictive substances and behaviours, necessitating ongoing vigilance.

> *Because of changes to your brain and genes, now you've got a dependence […] anything that is potentially addictive you are now vulnerable to […] You need to be careful to all of these.* FGD 5

Relatedly, participants outlined the process by which a substitute could precipitate relapse.

5.3.5. Substitution, Relapse and Recovery

As the behavioural addiction may resume post-treatment, it represented potential substitute addictions. Participants concluded that life in recovery did not encompass (potentially addictive) behaviours that cause dysfunction.

> **Interviewer:** *If someone has substituted their addiction, are they in recovery? […]*
> *That depends on the addiction or the substitution […] how harmful is the behaviour […] Your behaviour and attitude is the same […] You'll start doing the same things.* FGD 1

Service providers grappled with the question of whether a service user admitted to an inpatient substance use treatment facility was in recovery if they did not disclose a concurrent behavioural addiction.

> **Interviewee 3:** *When I leave the facility and I'm no longer using the substance but I'm continuing with my gambling addiction… am I in recovery? […]*
> *'I am addicted to tik, but I'm also addicted to gambling'. What if I do identify both of them as an addiction? […]*
> **Interviewee 2:** *You're 50% in recovery.* FGD 4

Being triggered, overwhelmed by cravings or, perceiving that the substitute behaviour is not sufficient to meet the desired need may precipitate relapse.

> *And eventually when you have too much other triggers […] the moment […] the substitute is not enough, then you relapse. Impaired judgment or your cravings are just too much […] I always tell them: 'the tools that you learn here, how to cope with the triggers and cravings that's your medicine' […] 'you have to plan it every day so that you, you feel better'.* FGD 5

Substitute behaviours were believed to be detrimental to recovery and to precipitate relapse by masking feelings, and emotions and leading to a false sense of coping. Family members heightened relapse risk by permitting the use of certain substitutes. Their endorsement of certain substitutes may be a result of their substance use or limited insight into addictive behaviours.

> *It does take away one's focus from the recovery process […] That thing actually puts you back ten steps. […] It takes away that balance. […] you're gonna be focused on one area […] too much. And this is what makes it negative. […] This thing becomes and consumes you. […] Because you're masking your feelings and emotions and it will always be your go-to then. […] you're not really coping. Because you're not dealing with the issues as they're coming.* FGD 1

> *So, families will also just glance over the substitutes. Or they will even provide. […] 'Methamphetamine is my drug of choice', but the people at home are still smoking marijuana […] so then they will substitute it. So, if the family isn't educated […] relapse has a much higher chance.* FGD 3

It was argued that substituting indicated that someone had not acquired the necessary skills and knowledge to stimulate the reward centre in more adaptive ways. Furthermore, participants perceived that persons who substituted were *not* in recovery, as the substitute functionally replaced the terminated substance. Substituting was seen as a sign of impending relapse and as a pathway to relapse to the primary substance. As substitution hindered engagement with sources of recovery support, it was regarded as a relapse risk.

> *Over a period of time, it does impact your recovery because it will become your go-to thing and you're not using your tools anymore. […] You did that substitute thing that gave you the feeling you needed to carry on. So, you're not […] coping. Not doing well, really. I'm not speaking to my sponsor. I'm not checking in with anybody, because now I already had an outlet.* FGD 1

> *It is a risk […] You are not really recovered from the drug addiction. […] If you substitute you go back to the original drug.* FGD 2

> *If you leave one substance for the other one, in the end the other one becomes your crutch. You will get attached to that one or the other one if it's like alcohol, you get drunk and you just relapse into your primary substance. So, I think it's a very negative prognosis because if you really want to recover you shouldn't substitute anything else, whether it's medication – ja.* FGD 5

> *I'm in recovery with the substance but I'm still gambling. […] And if I continue engaging in this activity, whether I consciously see it as an addiction or not […] it's gonna cause problems in different facets of my life. […] It means that I haven't gained the necessary skills, the knowledge […] to be able to stimulate my reward system without […] a negative impact. If I continue […] the chances that I will relapse into my other addiction is greater. […] You cannot be in recovery if you're still engaging with something that causes dysfunction in your life.* FGD 4

5.3.6. Harm reduction

Not all participants see substitution as congruent with recovery, and as representing a relapse or continuation of active addiction. One participant, with a personal history of recovery, appeared to endorse a harm reduction stance, stating that certain behaviours may continue in recovery, provided it is within socially acceptable parameters. However, this view was not shared by all service providers in the focus group.

> **Interviewee 2:** *Substituting is not recovery […]*
> **Interviewee 3:** *Or you were never in recovery. So, you are relapsing and you were never in recovery […]*
> **Interviewee 5:** *I think that if there is behavioural change, to socially acceptable norms and […] standards. Then you can say that I am in recovery […] Depending on how permissive your society is […] Because now you are (in recovery), with the exception of socially acceptable drinking and cigarettes, pardon those.*

Interviewee 2: *Don't fool yourself*
Interviewee 5: *[…] For me, 26 years of recovery […] I had to substitute a lot of things. […] So, I'm speaking from my own perspective as a recovering addict.* FGD 3

Some state that substitution was not regarded as a form of harm reduction as each potentially addictive behaviour had its harms and risks. As addictive behaviours were inherently progressive, it was argued substitution only replaced one set of risks and harms by another.

> *Substitution is not harm reduction because substitution […] is replacing one addiction with another […] So how am I reducing harm […]? […] crystal methamphetamine, brought its own set of harm, of risk […] And now I'm substituting it […] with gambling, which brings its own set of risk and harm. […] I'm now no more aggressive […] But I'm selling all my stuff and my house […] My whole salary goes to casinos […] Addiction is a progression […] with another addiction […] it's gonna get worse, the longer I stay with that substitute.* FGD 4

Within their abstinence-based treatment programme, participants mentioned 'one or two' service users seeking to reduce their alcohol consumption. However, use soon escalated. While there was an awareness of the harm reduction literature, harm reduction was not taught within the programme it was said.

> *What we teach them […] is not to drink at all, but I know there is lots of evidence on harm reduction for people that's maybe at an Ambivalence stage of totally quitting. […] Ja. Sometimes people don't want to come for rehab. We have one or two that try to just drink less but then in a while we hear oh they're back up there again. So, difficult.* FGD 5

Another participant recounted how in the postgraduate training programme in addiction care that she had undertaken, she had been open to the idea of cigarettes substituting for a SUD as depicted in a case study. However, while she believed that smoking was not a coping mechanism, it was recognised to be a form of harm reduction.

> *One of the case studies concerned with Christmas, the holiday season and the person's patient had stopped using cigarettes. As a result of the stress etc, he started smoking again. […] And it was terrible for this therapist. And deep within myself I thought: 'it's ok'. […] 'at least it's not the drugs'. It is still not a coping mechanism. But […] in that moment I thought. 'Take your cigarettes, it's fine'. So, harm reduction. Ja.* FGD 5

Participants shared that different substances can lead to a SUD and that while a substance may be initiated and initially be less harmful, it was likely to progress. Thus, substitutes were regarded as inevitably negative for recovery, leading to relapse to the index substance or another substance.

I once had a patient who used tik and on his own – easily – stopped using because […] – there were consequences; his wife threatened him etc. And then he started using alcohol to the point where it became his primary substance. By the time that he got to rehab, he had developed the insight that it was his behaviour and that it was about: 'it doesn't matter what, I become dependent'. […] even if they were entirely different substances. FGD 5

5.3.7. Therapeutic Responses and Detection

Service providers explained their preferred therapeutic responses to substitute addictions. Detection of substitutes occurred at various points during treatment, as well as after treatment. Service providers screened for the presence of multiple, co-occurring addictions at treatment entry during the intake assessment interview as these represented potential substitute behaviours. During treatment, staff members monitor and engage in dialogue with service users to detect any potentially worrisome behaviours and substitute behaviours. When clinical staff are off-duty or are not scheduled to be involved in activities with service users, non-clinical staff observe and interact with service users. These staff either provided feedback to service providers of which they informed service users or encouraged the service user to make disclosures to service providers to process it.

5.3.7.1. *At treatment intake*

During the intake assessment, service providers gathered detailed information on the addiction career of service users. Some service providers also incorporated diagnostic instruments such as the ASSIST (Alcohol, Smoking and Substance Involvement Screening Test; Humeniuk et al., 2008) and a genogram (visual representation) into their initial assessment. However, service providers did not uniformly screen for co-occurring behavioural addictions during intake and some service users withheld or did not think to disclose potentially relevant information.

Interviewee 1: *When I do the assessment […] it could take up to two sessions. […] I pick up patterns and […] the genogram will tell me how far back, what was […] how long that they used, what was the behaviour and so on […]*
Interviewee 3: *Proper assessment […]*
Interviewee 1: *I would use the ASSIST […] (it) quantifies the information […] you can actually see there's two drugs of choice […] As the programme goes along, different information comes out* FGD 2

Because if I look at our assessment tool that we're using now, it doesn't ask about other addictions, it only asks about substances […] So, asking the questions: 'Are there anything else that you are using excessively?' […] 'Are there any other activities that you are doing that you find problematic in your life?' FGD 4

Or maybe the question wasn't asked earlier. I'm thinking now if our admission form asks that question about gambling or other things now; so maybe that is something that we need to look at FGD 5

Nevertheless, (potential) substitutes could be detected throughout the programme, offering an opportunity for intervention. Other behaviours may only manifest post-treatment, necessitating psycho-education and enabling facilities providing aftercare to continue intervening.

5.3.7.2. *Over the course of treatment*

Substitute addictions could be detected during treatment, through interaction with the service user during set times for therapeutic intervention or during the routine operation of the treatment facility. Interactions with service users may entail engaging in dialogue or observations to identify certain behaviours, patterns or changes; potential substitutes the service users themselves may still be unaware of. As this required service providers as well as support staff to work closely with each other, it was recognised that support staff too required sufficient knowledge of substitute addictions, and the requisite reporting skills to share their observations.

I'm the social worker […] I only get certain amounts of information: clients who behave very well. But then you have the Recovery Assistants, who are just observing them at night, when they're talking […] relaxed […] because I've left for the day […] I do my one-on-one, I do what I need to do, but we allow for that interaction because we get so much information from there […] So, when we meet in the morning […] now we get to address it like that. But it should be an ongoing process – FGD 1

Observations. […] Patterns change and the behaviour changes […] We need to observe. All the time FGD 2

The people who work with them for 24 hours need to be dedicated, […] trained, […] considered as important in […] observing and reporting, and they need to know how to do it in a manner that is sensible, that you can use that information. […] FGD 2

They won't tell you, because they don't realise it's a problem. If you sit in the dining room you'll see, you know them FGD 3

5.3.7.3. *After treatment*

Service providers expressed that substitute behaviours may be detected post-treatment. When a facility had an aftercare programme, they could continue the therapeutic relationship, and in so doing detect substitutes.

> *While we're dealing with the primary we're able to see, when we analyse your lifestyle […] But often not and it only then manifests then in aftercare or after treatment […] And only after a month or two because clients are on a pink cloud.* FGD 1

> *A very difficult thing to deal with […] There's no cure for it all […] It's just constant maintenance […] People need to make you aware of these things […] And some sort of therapeutic help as you go along.* FGD 1

> *You need to understand that we get very little feedback once they leave the gate. When they're gone, we can't call. Unless they come back to the programme. It's not as if we get a regular, quarterly report informing us of how it's been going after discharge.* FGD 4

5.4. Prevention and Education

Service providers discussed the range of ways in which they sought to prevent substitute addictions. Prevention necessitated psycho-education of service providers themselves, service users, their families and the community. Recovery support was also believed to play a critical role in preventing substitution, particularly when the substitute was socially accepted and might be overlooked.

5.4.1. Educating service providers

The first step to preventing substitute addictions was said to be for service providers to be aware and informed to simultaneously address it with service users.

> *To just be aware that there is substitute addictions. Because sometimes we take for granted, we're just happy that they're running outside or that they are eating. So sometimes we don't pick up that there is a red flag. […] If service providers are also just aware of the dangers of substitute addictions, that can be something that is focused on and not just glossed over.* FGD 3

> *If I'm a therapist, if I don't understand dependency I won't be able to treat you appropriately and I think the same with family.* FGD 5

This was particularly important as it was recognized that certain substitutes may be engaged or acquired in treatment:

> *Sitting in front of the TV […]. The smoke breaks* FGD 2

The smoke breaks. Because that's something that we still allow, although we're not supposed to. […] And that becomes an obsession, fixation. 'I must'. Something actually very similar to the use of the substance. 'I must use this'. If I don't use this then they're all up in ruckus and they're nervous and they're all edgy FGD 4

5.4.2. Educating service users

Service providers believed that educating service users was central to preventing substitute addictions. Equipped with knowledge, via dialogue and psycho-educational lectures, service users could avoid substitution. Two facilities (FGD 1 and FGD 5) had dedicated lectures while others discussed substitution during assessment and throughout treatment (FGD 2, FGD 3 and FGD 4).

In one facility, towards the end of the programme, substitution was discussed in the context of a broader discussion on relapse prevention. Discussions included former service users receiving aftercare at the facility who could reflect on their experiences post-treatment.

Week five, we focus on relapse prevention… Warning signs, high-risk situations, triggers, reservations […] and substitution. By reservations we bring that up. The clients are aware of substituting […] when they leave here. They are also aware of their reservations that they hold on to. Justifications. […] We also have […] a peer support group, where we have aftercare clients sitting with inpatient clients and those things get thrown back and forth. I'll give a topic, and they also speak about it. And then the inpatient clients will ask the aftercare clients: how do you actually deal with this thing FGD 1

In another facility, a dedicated psycho-educational lecture discussed the leading 10 substitute behaviours. The lecture elucidated various substances and behaviours that could emerge as substitutes as well as how these could potentially manifest.

We highlight the 10 most common cross addictions. I always start with alcohol because alcohol is legal […] nicotine dependence […] food addiction […] I tell them about people that overeat themselves; they can't get out of their beds […] Then I bring it back to drugs. Some people smoke drugs because they don't want to get fat, because some drugs make you thin. Then instead of eating, you decide to smoke but you know you're hungry but you won't eat. And then I also talk to them about video games […] sex addiction, shopping addiction, pills too and then […] cell phone addiction. […] browsing the internet, you keep watching videos, and not after long your mother receives a bill of R 2000. FGD 5

5.4.3. Educating families

Each focus group emphasised that service users' families should be involved in treatment to avoid (unknowingly) facilitating substitution or leaving the behaviour of the

service user unaddressed. While service users were expected to implement changes, so too would families. Once families understand the possible trajectory of substitute addictions and their importance for recovery and relapse, they could intervene early and/or prevent it.

> *It's very important to include them. Because […] families almost dump the person in a centre and […] they don't expect that they need to change anything. So usually […] we work with the patient, they heal. But they go back to the same environment. […] So, they will then just be also […] too happy that the person is eating or […] is not the same as […] before he came in.* FGD 3
>
> *Illegal, ja, to something legal, and then sometimes the family even supports them. Because in the family's eyes there's not really something wrong with a few glasses of wine - (compared) to the tik they were using.* FGD 5

The role of mutual aid groups was discussed as another important source of recovery support to be accessed.

> *What is a vital part of aftercare is that they're in a support group. Because there are people who understand and people who they can soundboard so people can warn them, you know? I think you're steering into dangerous territory. And the guys who do well, the guys who go in support groups*- FGD 3

> *The person leaves in-patient treatment and then now living a life of sobriety or in recovery. So, a lot of stuff creeps in […] sex, alcohol, gambling. […] supposed to be normal things, socially acceptable things […] When you make him aware of those things in early treatment, you can still help that person conquer that thing. Or make it easy for them to understand as they go along.* FGD 1

5.5. Discussion

The current study explored the viewpoints of service providers from SUD residential treatment facilities concerning substitute behaviours and addictions during focus group discussions in five treatment facilities. The key findings to emerge from the study were that service providers defined substitute addictions as (licit or illicit) substance or behavioural replacements for a terminated primary SUD. Substitutes were believed to emerge gradually or immediately upon abstinence to (un)consciously fill the void of the (terminated) primary substance. According to service providers, key motives for substitution were functional replacement: to manage cravings; mask feelings and emotions; achieve intoxication and time-spending. Substitution may also be intentional during periods of forced abstinence or, arise from an initially legitimate use of a licit substance for treatment with awareness only developing later. The social acceptance, legality and/ or familial endorsement of the

substitute may influence the nature of the 'selected' substitute. The focus group discussions reveal that substitutes may also be engaged after a period of experimentation until the desired appetitive effect was achieved, and, to self-medicate. Substitution may be motivated by deriving insufficient pleasure from prosocial activities, or, coping with an unmanageable lifestyle. The leading mechanism identified by service providers through which substitute behaviours were thought to arise was through co-existing behaviours. That is, that service users may present to treatment with a set of addictions of which they typically identified a primary addiction to be addressed. The secondary, concurrent behaviour may escalate and grow to the strength of an addiction and the non-disclosure of a concurrent behavioural addiction that also *led to dysfunction* rendered the individual no longer in recovery. The 'secondary'- concurrent behaviour - which may have complemented, been masked by the primary addiction or emerge periodically, may not be addressed or disclosed during treatment. Furthermore, service users may minimize the co-existing behaviour (which may be more problematic than the behaviour that is the focus of treatment). Participants implicated neurobiological adaptations as a vulnerability to potentially addictive substances and behaviours; that substitution may be an unconscious, automatic outcome that maintained the conditioned brain response. As the default response during active addiction had been to use the primary substance, preventing substitution necessitated vigilance. Substitution was most commonly discussed in the context of relapse risk, which service providers sought to mitigate. Therapeutic responses centred on detecting and preventing substitute addictions.

While a key challenge in the literature remains the lack of a universal definition of substitute addictions, it is notable that all service providers' definition aligns with a recent, comprehensive definition constructed from a scoping review of the literature (Sinclair, Sussman, Savahl et al., 2021). Therein, substitute addictions are defined as "the immediate or gradual functional replacement of an addiction or set of addictions that have been terminated" (p. 692). Given the array of terms used to refer to substitution, and the lack of standardized terminology, it is also interesting to note that service providers tended to prefer the term "cross addiction", arguably the most widely used and known term. However, it has been cautioned that *addiction* should not be applied too loosely (Sinclair, Sussman, Savahl

et al., 2021) and that the substitute should display characteristics of addiction, such as incurring negative consequences, loss of control, preoccupation and achieving an appetitive effect (Sussman, 2017; Sussman & Sussman, 2011). Recent empirical work on substitution has thus made an important distinction between substitute behaviours and substitute addictions. Conceptualised on a continuum, behaviours have the potential to progress to addictive levels over time, and addictions vary in severity (Sinclair, Sussman, De Schryver et al., 2021). Though service providers did discuss the progressive nature of addictive disorders, they did not distinguish substitute behaviours from addictions. Relatedly, conversations concerning substitution centred on relapse risk, and not on harm reduction.

Service providers' perceptions of the motives for substitution are in keeping with extant literature that substitutes are used for specific outcome expectancies such as managing cravings; achieving intoxication; time-spending; experimentation; due to social acceptance and legality and, to self-medicate (Sussman & Black, 2008; Sussman & Sussman, 2011; Chiauzzi, 1991; Shapira et al., 2021; Sinclair, Sussman, Savahl et al., 2021; Sinclair, Sussman, De Schryver et al., 2021). While substitution has been attributed to being influenced/triggered by others (Sinclair, Sussman, De Schryver et al., 2021), the role of familial endorsement identified by service providers is an important nuance. 'Enabling' behaviours of significant others is known to help precipitate relapse (Chiauzzi, 1991).

Participants' awareness that service users may present to treatment with a set of addictions of which they typically identified a primary addiction, aligns with the finding of increased use of/greater engagement in behaviour in the 'untreated' addiction in a set of addictions (White & Kurtz, 2006; Sinclair, Sussman, Savahl et al., 2021). Yet, screening for multiple addictions at intake was not a uniform practice. This is in line with a South African study (Keen et al., 2015) on multiple addictions in which 54% and 24% of 123 inpatient service users in treatment for SUDs respectively, presented with addictions to gambling or sex, and coexisting gambling and sex addictions. However, none of the three participating facilities routinely assessed for the presence of multiple addictions or incorporated its management into the treatment programme (Keen et al., 2015). Multiple addictions may also precipitate reciprocal relapse, wherein a compulsive behaviour triggers relapse to a substance and vice

versa (Schneider, 1991). Service providers have been cautioned to recognise that service users may become trapped in a reciprocal relapse pattern upon terminating an addictive behaviour and substituting it with another addictive behaviour (Irons & Schneider, 1994).

The relationship between co-occurring behaviours which may complement, be masked by the primary addiction, or may emerge periodically, relates to Carnes et al.'s (2005) concept of Addiction Interaction Disorder, in which co-existing addictions interact, support and join in 11 distinct patterns. Interactions compound the harms of every addiction and the addiction 'package' is more problematic than each on its own (Carnes et al., 2005). Of the 11 meta-patterns of addiction interaction, Carnes and colleagues' (2005) concepts of alternating addiction cycles (the dominant addiction shifts in a pattern, weaving back and forth in a patterned systemic way), fusion (addictions that always present together) and masking (using one addiction to conceal another) relate directly to substitute addiction (Sussman, 2017) and the views of our study participants.

A comprehensive assessment of relapse potential is best conducted collaboratively with the service user, wherein the service provider draws upon formal assessment instruments and clinical judgements; the service user, in turn, provides subjective and experiential information (Chiauzzi, 1991). Chiauzzi (1991) offers an empirically-informed relapse risk assessment framework, as an aid to uncovering undisclosed information or information considered unimportant by the service users; a key challenge also identified by participants. The assessment covers the following areas: "(1) historical factors (family history, relapse history, treatment history, self-help history, and substitute addictions); (2) biological risk factors (dependence, craving/cue reactivity, sensation-seeking, and health factors); (3) psychological factors (expectancy, coping skills, personality, and psychopathology); and (4) social factors (stability of relationships and environment)" (p. 64). In doing so, a more transdiagnostic treatment approach can be adopted in which the underlying mechanisms common to both may be incorporated and targeted (Kim & Hodgins, 2018). Furthermore, as expressed by service providers, the nature of and motive for the substitute are important to consider when assessing its risk for leading to similar or greater

harm, relapse and/or the development of another addiction (White & Kurtz, 2006; Horvath, 2006; Moore, 2010).

Participants implicated neurobiological adaptations as a vulnerability to potentially addictive substances and behaviours and in keeping with the Syndrome Model of Addiction (Shaffer et al., 2004). As a syndrome, a constellation of symptoms and signs become manifest (which are not all necessarily present simultaneously) that are related to an underlying condition. The model comprises Distal Antecedents of the Addiction Syndrome, as well as a Premorbid Addiction Syndrome. Distal Antecedents include neurobiological and psychosocial components that render an individual vulnerable to addiction when their exposure to and interaction with the addictive agent is reinforced through responses meeting expectations. During the Premorbid Addiction Syndrome phase, the individual either crosses the threshold to addiction or remains at risk for the development of the syndrome, depending on their subjective experiences with the addiction of choice. The theory further proposes that multiple (potential) expressions of addiction signal that the object of addiction (i.e. a substance or behaviour) is a less central concern than is the presence of the syndrome itself. That is, substitute addictions constitute different expressions of the addiction syndrome (Shaffer et al., 2004). The first empirical investigation of substitute addictions in South Africa (Sinclair, Sussman, De Schryver et al., 2021) revealed that 36% of the 137 residential inpatient service users in the study substituted for their SUD. Substitutes were predominantly behavioural (substance-to-behaviour-substitution) rather than substances (substance-to-substance-substitution). Furthermore, 23% of respondents had relapsed and 40% had maintained abstinence.

Service providers' contention that vigilance is necessary for recovery is consistent with leaders in the recovery arena that highlight the high risk of relapse, as well as substitute addictions in early recovery (Vanderplasschen & Best, 2021; Sussman & Black, 2008). Substitute behaviours may be an antecedent to relapse by lowering inhibitions and/or detracting from engagement with recovery support. Lower levels of recovery capital are linked to relapse while moderate levels are positively associated with substitute behaviours post-treatment (Sinclair, Sussman, De Schryver et al., 2021). Recovery capital extends to

personal, familial and social as well as community resources that support recovery (White & Cloud, 2008). Service providers asserted that substitution was a sign that someone was not coping or was not using their coping skills. The substitute behaviour may also exact a toll and lead the person to other (maladaptive) coping mechanisms. Recovery capital also has links to the availability of alternative, adaptive, appropriate and effective coping skills within the service user's repertoire that can be applied to high-risk situations (Sinclair, Sussman, De Schryver et al., 2021; White & Cloud, 2008). Thus, there is a need to differentiate negatively consequential substitutes from harm reduction substitutes.

While the complexity and challenges inherent in treating persons with SUDs are not to be diminished (Sharma, 2012), it is equally important for service users to be critical of their practice. Some facilities appeared to allow smoke breaks while recognising nicotine as a leading substitute in their psycho-educational lectures on substitute addictions. Cigarette smoking is known to be associated with an increased risk of relapse to a SUD (Weinberger et al., 2017), as well as the leading lifestyle cause of premature death (Sussman, 2017). Finally, service providers should also recognise that substitution can be a time-limited activity. In the current study, temporary substitution was not described as a tool that could potentially be leveraged in early recovery (depending on the nature of the substitute behaviour), but rather as something engaged short-term until a 'suitable' substitute was found from which the desired appetitive effect was derived.

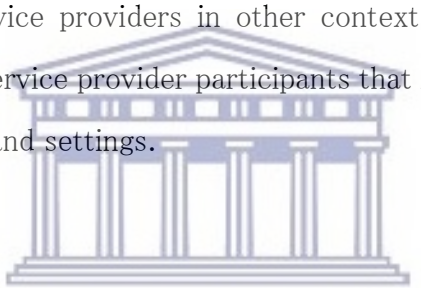
5.5.1. Clinical implications

To provide a more complete clinical picture, we recommend that screening for the presence of multiple addictions becomes a routine practice. Once the set of addictions is established, an assessment should be performed to define their nature, dynamics and interactions. When exploring substitute addictions, service providers should also be mindful of the relative harm caused by a substitute (Sussman, 2017), and do a case-by-case risk analysis to determine the service user's awareness of their "potential danger" (Chiauzzi, 1991, p. 67). However, service providers should also remain aware that substitute behaviours are not only potential threats to recovery that lead to or precipitate relapse; substitute

behaviours may foster recovery (Horvath, 2006). Sussman and colleagues' (2011) Addiction Matrix Self-report measure, a comprehensive listing of 29 substances and behaviours may form part of screening and assessment at intake (see Sinclair, Sussman, De Schryver et al., 2021). Furthermore, measures such as the Strengths and Barriers Recovery scale (SABRS) [Best et al., 2020] could enable service providers to compare recovery strengths and deficits during active addiction and in recovery, to facilitate informed treatment planning.

5.5.2. Limitations

The findings from this study should be considered in light of its limitations. Our sample represents a limited number of service providers from one South African province and residential facilities with an abstinence-based philosophy. We are therefore aware that views may be unique to such settings and programme philosophies. In addition to exploring substitute addictions with service providers in other contexts, a high priority for future research is to recruit diverse service provider participants that represent varied practitioner types, treatment philosophies and settings.



5.5.3. Conclusions

The present study has demonstrated the importance and value of understanding how service providers conceive substitution and its etiologic mechanisms and draw on these views to inform their decision-making and practice. Given the relatively limited literature base on substitute behaviours, these findings represent a critical first step toward implementing good practices and optimizing recovery outcomes.

Chapter 6[5]

Narcotics Anonymous attendees' perceptions and experiences of substitute behaviours in the Western Cape, South Africa

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Abstract

Little is known about the dynamics of substitute behaviours during recovery among persons attending mutual aid groups. Insight into the nature, motives and course of substitute behaviours could help to shape recovery support services and facilitate maintenance of recovery. Semi-structured in-depth interviews (n=23) were conducted with Narcotics Anonymous attendees in the Western Cape, South Africa. Thematic analysis yielded four themes: (i) substance-to-substance substitution; (ii) substance-to-behaviour substitution; (iii) substitute behaviours and harm (reduction) and (iv) support needs to manage and resolve substitute behaviours. According to the study participants substitute behaviours developed across recovery stages; were temporary or long-term replacements of SUDs and were engaged to distract, isolate, calm, occupy the mind, assuage boredom, keep occupied, fill a perceived experiential void, modify mood and self-medicate. Substitutes included: cigarettes/vaping; food; sex, relationships and pornography; exercise; binge-watching; work; coffee; shopping; gambling and stealing. While substitutes were utilised for harm reduction or relapse prevention, the potential for ostensibly healthy behaviours to threaten recovery and lead to relapse was also recognised. Self-monitoring, ongoing vigilance and an awareness of when substitutes become genuine addictions are critical for timely, suitable interventions.

Keywords: substitute behaviours; recovery support; substance use; behavioural addictions; mutual aid groups

[5] Sinclair, D. L., Sussman, S., Savahl, S., Florence, M & Vanderplasschen, W. (submitted for publication). Narcotics Anonymous attendees' perceptions and experiences of substitute behaviours in the Western Cape, South Africa.

6.1. Introduction

With a presence in 139 countries, and approximately 67,000 weekly meetings, Narcotics Anonymous (NA) is one of the largest global fellowships of persons in recovery from SUDs (NA World Services, 2021; Sussman, 2017). NA, alongside other 12-Step programmes (e.g. Alcoholics Anonymous), represent a peer-assisted pathway to recovery (White & Kurtz, 2006) and an adjunct or alternative to treatment (Day, Kirberg & Metrebian, 2019; Laudet, 2008). 12-Step affiliation has been shown to facilitate continuous abstinence and remission, as well as confer recovery-supportive benefits including connectedness, support, acceptance and enhanced QoL (Dekkers, Vos & Vanderplasschen, 2020; DeLucia et al., 2015; Kelly et al., 2021; White, Budnick & Pickard, 2013; Laudet, 2008). Barriers to attendance include poor fit, negative experiences within NA, becoming established within NA but not mainstream society (Vederhus, Høie & Birkeland, 2020) and refusal to accept key tenets (Kingston et al., 2015). While the 12-Step fellowship itself is intended to be "vastly more than" a "sufficient substitute" for abstained addictive behaviour (the 'Big Book', 2001, p. 152), and NA is premised on "powerlessness over a process of addiction rather than powerlessness over a particular substance" (White, Budnick & Pickard, 2013, p. 2), substitute behaviours, may precipitate relapse (Selby, 1993; Melemis, 2015; Chiauzzi, 1991; Horvath, 2006).

Though research interest in substitute behaviours has recently been renewed (Kim, 2021; Shapira, 2021), the vast majority of studies have been undertaken in the US (Sinclair, Sussman et al., 2021). Moreover, an abundance of these studies, mirroring the recovery literature more broadly, has centred on those in early recovery (less than one year). To further elucidate "when and for whom this concept applies" (Sussman & Black, 2008, p. 176), those in sustained (between one and five years) and stable recovery (more than five years; Betty Ford Consensus Panel, 2007) can also offer critical insights into the occurrence of substitute behaviours, course of involvement in substitutes, and how the use of substances or engagement in behaviours relates to recovery

In LMICs such as South Africa, the approximately 350 face-to-face NA meetings in all provinces are a testament to the widespread, global adoption of the programme. Yet,

research on peer-assisted recovery in general, and NA in particular, in LMICs remains limited (Stokes, Schultz & Alpaslan, 2018). There is an identified need to elucidate NA members' recovery experiences (DeLucia et al., 2015). NA attendees represent an important and comparatively understudied population for improving our understanding of substitute behaviours and addictions. Greater knowledge of the nature, motives and trajectory of substance and non-substance substitute behaviours throughout recovery stands to inform treatment and recovery support services. Consequently, the purpose of this study is to explore Narcotics Anonymous attendees' perceptions of and experiences with substitute addictions in the Western Cape, South Africa.

6.2. Methods

As part of a broader multi-method, multi-perspective study of the nature and dynamics of substitute addictions, this article employs an exploratory design within a qualitative methodological framework. Data for this study were collected through individual in-depth interviews guided by a semi-structured interview schedule (Appendix 6). Specific *substances* that were probed around included alcohol; nicotine/cigarettes; CAT (methcathinone, ephedrine); cocaine/crack; cannabis; cannabis/Mandrax; ecstasy; heroin; inhalants; methamphetamine; nyaope/whoonga (low-grade heroin, cannabis products, antiretroviral drugs and bulking/cutting agents; Mthembi, Mwenesongole & Cole, 2018); over-the-counter and prescription medicines. Potential substitute behaviours that were queried were exercise; shopping; sex; eating; work; love/ relationships; religious activities; use of the internet and video games; social networking (e.g. Facebook) and/or gambling (the focal addictions mentioned in Sussman, 2017).

6.2.1. Participants and sampling

Participants were recruited using purposive sampling and snowball sampling techniques. The only inclusion criterion was current NA meeting attendance. As recovery support groups enforce anonymity and have a closedness to 'outsiders' (Galaif & Sussman, 1995), initial access resulted from referrals by members of AA that were already recruited

into the larger study for interviews. The referral from AA was essential for gaining entry as well as establishing trust. After each completed interview, and to ensure that anonymity was upheld, participants were asked to explain to their potential referrals the purpose of the research and how data would be collected. Only those expressing willingness to participate were asked to provide contact details and were then contacted.

6.2.2. Data collection

Individual in-depth interviews (n=23) were conducted at participants' homes and workplaces, restaurants and coffee shops. Nineteen interviews were conducted by the lead author and four interviews were conducted by a master's student with the lead author in attendance between 18 October – 16 December 2018. Interview sessions, which were conducted in English and/or Afrikaans, were audio-recorded, lasting between 31 and 157 minutes. Participants ranged in age from 22 – 55 years (SD = 9.353), of which 14 were male and 9 were female. Three participants were in early recovery (< 1 year), ten were in sustained recovery (1 - 5 years) and ten identified as being in stable recovery (5 > years). One participant identified as 'Black', thirteen as 'Coloured' and nine as 'White', of whom three were non-South African citizens (Belgian, Dutch and British, respectively). Four participants were divorced, eight were married and 11 were unmarried (one engaged). A description of the participants is provided in Table 1.

6.2.3. Procedure and ethics

This study was approved by the Biomedical Research Ethics Committee of the University of the Western Cape (BM18/4/13). Each prospective participant was informed of the purpose of the research in advance of the interview and was required to consent to participation. At recruitment, confidentiality, the voluntariness of the research and participants' right to withdraw at any stage were emphasised.

6.2.4. Data analysis

Audio recordings of interviews were transcribed verbatim and data were analysed thematically (Aronson, 1995). This analysis focuses upon (1) any behaviours or activities that were used or engaged repeatedly / more / had been initiated since coming into recovery; (2) perceived motives or factors that played a role in (potential) substitution occurring or not; (3) perceptions of substitute-related harm and (4) related recommendations for treatment services. The analysis entailed becoming acquainted with the data through transcription and repeated reading of the text. To start identifying patterns within interviews, initial codes were assigned. Thereafter, excerpts that corresponded to emerging patterns were highlighted. Next, themes and sub-themes were generated and discussed to reach an agreement on adequacy. Finally, the findings were situated within the extant research literature.

Table 1: Description of participants (n=23)

Participant	Gender	Age	Race	Time in recovery	Received treatment (outpatient/ residential)	Substitutes since entering recovery
1	F	50	White	4 years	No	Sex/relationships
2	F	36	Coloured	10 years	Yes	Shopping; food; work; cigarettes; coffee
3	F	43	Coloured	16 years	Yes	Cigarettes; food
4	M	38	White	1 year 8 months	Yes	Do not believe they substituted
5	M	55	Coloured	9 years 6 months	Yes	Cigarettes; sex/relationships, pornography; binge-watching
6	M	44	Coloured	8 years	Yes	Cigarettes
7	M	26	White	3 months	Yes	Cigarettes; exercise
8	M	51	White	8 years 11 months	Yes	Food
9	F	37	Coloured	4 months	Yes	Food; shopping; cigarettes
10	F	52	White	9 years	Yes	Exercise; cigarettes; coffee; work
11	M	39	White	5 years 2 months	Yes	Do not believe they substituted
12	M	31	Black	3 years 6 months	Yes	Do not believe they substituted
13	F	33	Coloured	7 years	Yes	Food
14	M	30	Coloured	4 years	Yes	Exercise; pornography; food
15	M	44	White	6 months	Yes	Cigarettes; coffee; pornography; food
16	F	26	Coloured	2 years	No	Food; gambling; cigarettes; binge-watching
17	M	30	White	3 months	Yes	Exercise
18	F	51	Coloured	14 years	No	Food
19	M	22	White	3 years 6 months	Yes	Stealing
20	M	34	Coloured	4 years	No	work; sex (escorts, pornography)
21	M	40	Coloured	3 years	Yes	Exercise; food; vaping; pornography
22	M	46	Coloured	13 years	Yes	Do not believe they substituted
23	F	46	Coloured	5 years	Yes	Cigarettes/ vaping; binge-watching

6.3. Findings

Four themes were identified within participants' narratives: (1) substance-to-substance substitution; (2) substance-to-behaviour substitution; (3) substitute behaviours and harm (reduction) and (4) support needs to manage and resolve substitute behaviours. Nineteen participants believed that they had substituted for their SUD with substances and/or behaviours of varying severity since first beginning their recovery journey. Illustrative quotes that best elucidate each theme are provided with accompanying participant numbers.

6.3.1. Substance-to-substance substitution

The leading substance-based replacements for a SUD among the selected NA participants were cigarettes and e-cigarettes (n=11). Four patterns of use were identified: initiating smoking in recovery; maintaining cigarette consumption at the same level as in active addiction; escalating cigarette use and tapering off/ wanting to quit. Participants also reflected upon the acceptance of smoking during recovery. Another substance-based substitute identified by participants was coffee (n=3).

Non-smokers provided accounts of initiating smoking during recovery. The behaviour may be maintained for a set time and then be abstained, or, may endure.

> *Two years clean and I stopped using cigarettes. […] So, I didn't smoke even in active addiction, but in recovery, when I was in treatment they said like "I think you probably need to smoke". […] And a lot of people's got that experience. So, like I started smoking a bit more and then Participant 5*

6.3.1.1. *Escalation in cigarette use*

Several current smokers observed an escalation in their cigarette consumption in recovery. Explanations for increased smoking included the availability of money, regulating anxiety and boredom and providing comfort.

> *Initially I did smoke more. But I've gotten it down to like a box a day. […] It's only natural to start smoking a little bit more in the beginning. In recovery, you've finally got money you can use for things. The first thing you buy is a box of smokes. Participant 4*

> *I smoked more in the year after I stopped using. So, it was like a comfort and it was also when I was anxious and so it was just all the time. […] I used to smoke maybe five-six cigarettes a day in active. I was smoking 20 a day (in recovery). Participant 10*

I didn't smoke a lot when I was […] drinking and using crack. […] The first two years in recovery I started smoking excessively. […] A pack in two days' time […] but sometimes more. […] Night there is nothing to do so you smoke. But I'm trying to quit. […] It's starting to escalate […] I have asthma it's actually affecting me very badly. I'm wheezing in the morning and coughing. Participant 6

6.3.1.2. *Vaping, tapering off and quitting*

Some described efforts to quit due to adverse health consequences, or reduce the number of cigarettes smoked. Efforts toward terminating use included reducing the number of cigarettes smoked per day as well as vaping. In the excerpts below the combination of reduced cigarette consumption and vaping for one participant, and vaping only for another was regarded as less harmful than the initial addiction set. Not all quit attempts were successful in the long term.

Cigarettes is one thing I've managed to cut down. I vape. […] And […] maybe six cigarettes a week […] I'd love to quit it completely, everything. And that's what I'm working for, towards […] But I also don't see smoking as a bad thing considering all the stuff I've dropped. That will also have its own time. Participant 12

Interviewer: *So, so, when you came into recovery, you started smoking more?*
Participant: *oh yes, definitely, definitely, because I felt that was the only thing that I had left. […]* Interviewer: *And then you transitioned to e-cigarettes?*
Participant: *Ja. […] And I know a lot of people have controversial issues with that, but, for me, I feel a lot healthier. There is no way I would be able to exercise with how much I was smoking. Never. And you know what, if it's something that I hold onto for a while, then, it's that, […] I'm not gonna stress about it. Participant 23*

I quit for three years and then I started again and then I quit for 18 months and then I started again. So, I think my biggest problem is smoking cigarettes. Participant 3

As expressed by Participant 7, while cigarettes are "the number one addiction" among persons in recovery, they are seldom discussed.

While respondents argued that illicit substances were more socially disapproved of and led to greater losses, the question was also raised of whether one was legitimately abstinent or in recovery, if cigarettes were mood-and-mind altering, as all drugs are.

Drinking too much coffee doesn't make you push a trolley (become homeless) […] smoking cigarettes doesn't ruin all your relationships. […] The hard drugs that do that. But get out there and swap it for all the other ones, uhm, to manage it. So then, are you actually really clean? […] A drug is a mood- or mind-altering substance. […] That cigarette alters my mood and my mind. Are we all in denial? […] 7 to 10-minute smoke breaks at NA meetings? We go and smoke drugs. Participant 15

6.3.1.3. *Coffee*

A few participants increased their coffee consumption in recovery or maintained the quantity used in active addiction, except when forced to abstain. A narrative also emerged around relative harm and the reduced harm from coffee use.

> *And caffeine, oh my God I was drinking (laughs) 15 cups a coffee a day. Easily. Easily. […] Participant 10*

> *I smoke cigarettes and drink a lot of coffee. They also think that's addiction but I'm not too hard on myself for that. Yes, one day I'm going to put it down; it's going to happen, it's going to happen, but not now (laughs). Participant 2*

6.3.2. Substance-to-behaviour substitution

Shopping, exercise, food, binge-watching, gambling, work, as well as sex and relationships emerged as behaviour-based substitutes for SUDs.

6.3.2.1. *Shopping*

The participants that reported shopping as a substitute (n = 2) illustrate that as a compulsive behaviour it may have been present during active addiction, and endured during recovery, or, that it may have been initiated in recovery.

In the first illustration, significant debts were incurred (20 000 ZAR/ € 1246,34 / $ 1344,95 at the time of writing). To engage in a buying-shopping episode the participant waited until she was alone at home, arranged transport to the mall and ensured that payment notifications would not reach her husband. It was only when she had exceeded her credit card limit that he became aware of her spending and advised her to limit spending beyond budget. Furthermore, peers in NA challenged her as to how often she was discussing shopping ("you are talking too much about shopping"), which prompted her to reflect upon what was underlying her behaviour.

> *I'd go to the shopping, you know, with money that I don't have […] and I could see it progressing […] I knew it wasn't a positive effect in my life. […] I try to fill a void with something then I go shopping […] and I think to myself: "Why do you need that specific thing? What is going on inside here?" […] Is it anxiety? Is it fear? Is it, is it loss of something? […] over 20 grand – I maxed it out within a month […] It was so easy. Participant 2*

The second participant illustrates that the excess money that was ordinarily allocated to purchasing substances was immediately used for shopping. A rewarding feeling was said to be derived from the buying behaviour. Furthermore, the ability to make others happy, rid oneself of the surplus money and eliminate an uncomfortable feeling state improved the view of the self. However, the behaviour was described as being unmanageable.

> *It's a coping mechanism that allows you to feel better about yourself. […] But the urge just to spend money it's crazy. It's unmanageable. Completely. […] it wasn't always me that had to benefit from all the shopping. […] I wanted to make everybody else happy. […] Now that I'm not inclined to go buy drugs, I will buy sweets, or I will buy luxuries for my kids […] The money will burn holes in my pocket. […] That feeling that I get rid of when I spend money or when I get rid of the money. […] It's much more rewarding. Participant 9*

6.3.2.2. *Exercise*

Some participants (n= 5) engaged in exercise for the range of mental and physical benefits it conferred.

One participant, who did not believe that he had substituted his addiction with exercise, recognised that he needed to remain vigilant to crossing the threshold to addiction. Exercise, including extreme sports such as bungee jumping, provided him with a 'natural high'. Perceived benefits derived from exercise included endorphin production and increased confidence.

> *Pursuing of adrenaline, […] I have to be careful of. […] I definitely do it way more. […] Going bungee jumping and then wanting to do it a second, third, fourth, fifth, sixth time. […] I never did that in addiction. It's a natural high. […] it's something that could get very addictive. […] The endorphins. […] Is better than any drugs. You'll build confidence […] You'll feel great, you smile. […] I think it's so important for me in recovery […] I'm not overdoing it. It's calculated. It's rewarding. My exercise isn't damaging to myself. Participant 4*

A participant in sustained recovery exercised intensively for 18 months in the third year of his recovery until sustaining a back injury. While he was motivated by the improvement of his physical appearance and affirmation from females, his exercise was also being used to avoid real-life issues. He conceptualised his actions as part of a pattern of immoderate involvement in behaviours.

> *I found myself very big, very big, very fat. Because I wanted to eat everybody's plate finished (laughs) […] And then I started exercising and then […] over-exercising and then I messed up my back. So ja, I always go overboard, with everything. […] I haven't actually been to the gym,*

[…] this whole year. […] I would probably still be gymming. […]to be out of my head man. […] so, I don't have to think about my, my reality. Ja. Participant 14

Another participant, who believed that he had substituted his addiction with exercise stated that his involvement with Mixed Martial Arts (MMA) escalated rapidly. He attributes his high engagement to finding a purpose for himself such that when he was assigned his placement for his medical training, he abandoned the exercise.

I got back into MMA. Very quickly I was like beating myself up for not going six times a week. I was close to within the first month accepting an amateur fight. […] I haven't trained in ages and […] I switched […] I found out about my placement at (hospital) and […] then had a purpose. […] I was just in recovery […] I was latching onto anything. […] I can […] get worth there. […] That was probably about three weeks. Participant 7

In another account, a participant cycled and ran six days a week until, at the insistence of her sponsor, she reduced the number of days she exercised. Her exercise schedule, coupled with long work hours led her husband and sponsor to express concern about her well-being.

So, this year exercise. […] I'm training for the Argus (Cycle Tour) I've entered twice before and haven't finished. […] I've also joined a running programme […] It was six weeks I did it six times a week and that's too much. […] I was sick. Sick, sick, sick […] and my husband said to me: […] You cycled and ran today. You haven't had a day off, you're working 10 hours at work. You are doing too much. […] And […] my sponsor […] said 'You look terrible, why are you so tired? What's going on?' […] 'Wednesdays off, Fridays off. That's it'. Participant 10

Lastly, a participant that previously played basketball nationally felt that his gymming had become 'obsessive'. Now, in the first three months of his recovery, he sought to recreate his earlier physical fitness level. He disregarded medical advice and despite injury resumed exercise earlier than recommended.

The month and a half after that, I was really obsessing about going to the gym. […] I wanted to be like before […], I played basketball on a national level. […] So, I was quite good, like buff. […] I still go to the gym sometimes but not every day anymore because […] it was really obsessive behaviour. […] In that period, I also had an injury […] and they said I had to rest for six weeks and after two weeks I was already in the gym. Participant 17

6.3.2.3. *Food*

Participants (n = 10) reported binge eating and overeating and food served many functions in recovery. Foods included but were not limited to highly palatable foods; those

high in sugar and fat. For some, dysfunctional eating patterns were cyclical, predictable and long-standing. Binge eating may be used to manage fear, anxiety, and discomfort and to avoid dealing with feelings.

> *I work on long binge-purge cycles, gain a lot of weight, eat very unhealthily. And then I lose it and I gain it again [⋯] The real problem behaviour at the moment is food [⋯] I've got this picture of a blanky. [⋯] I think a lot of 'addicts' have taken on a series of blankets. [⋯] Our inability to connect with our true feelings [⋯] something to pull over ourselves when we're afraid [⋯] nervous, [⋯] uncomfortable, [⋯] don't want to deal with feelings. [⋯] my blanket is food. Participant 8*

As the drug of choice may be used to regulate eating and manage weight, abstinence may be associated with altered eating patterns and weight gain which can be distressing. Food may also be used to assuage boredom and to keep occupied.

> *Because I've now stopped my other addictions it's progressed much faster and it's starting to bother me. [⋯] a month ago, I ate so much that I [⋯] had to vomit [⋯] I don't wait until I get hungry. I just eat because it's the next thing – if I'm not smoking, I'm eating. If I've got nothing to do, I'm eating. Which is terrible! [⋯] It's one of the reasons [⋯] I loved using tik, because it stopped me from compulsive eating [⋯]. It made me thin. [⋯] Gave me self-esteem, but also took everything else away from me [⋯] I kept using it, because I didn't want to end up like this. [⋯] it's that horrible feeling inside that's killing me. Participant 9*

The preoccupation with and effects of the primary substance in active addiction often led to food deprivation. In her recovery, however, this participant consumed large quantities of chocolate and a high-sugar beverage (six litres daily) leading her to express concern about negative health impacts, some of which she was already experiencing.

> *I'm eating everything I see. [⋯] You're not smoking anymore so you're eating [⋯] Gas cooldrinks. [⋯] That is the biggest problem I have. Since I stopped smoking, oh my goodness. [⋯] I had gastro now a few times; ulcer [⋯] Maybe three (2 litre) Jive (soft drink brand) cooldrinks, alone. [⋯] there must be a cooldrink in front of my bed. If I wake up in the night because I'm thirsty to drink, gas drink [⋯] This chocolate [⋯] it's almost like a drug to me now. But the gas is the, the baddest part. Participant 16*

In another example, when querying a lengthy bank statement, a participant that considers their relationship with food to be problematic found that she had purchased fast food on at least 54 occasions in a given month. As she went on to describe, "drugs and alcohol merely need abstinence" whereas food (and sex) require management. A task in recovery was thus to establish *how to* eat healthily.

I had a nine-page bank statement for the month. […] I found that I went to KFC for 54 swipes that month. Now, that excludes the amount I paid cash. […] More than twice a day, obviously sometimes three or four times a day […] That's ludicrous. […] I've got a very very toxic relationship with food. Participant 13

6.3.2.4. *Binge-watching*

A few participants (n= 3) noted that binge-watching series or pornography was a way to isolate themselves, avoid emotional pain, and escape reality.

If I'm angry and I want to isolate I can watch a whole series […] the entire weekend […] I'll call in take out, I won't even cook. I will just stay there in my room just watching […] To avoid people. […] When I had really bad time or when my daughter immigrated, and I didn't want to deal with that pain. And I just started a whole lot of series because then I don't have to think. So, it is a way of escape. Participant 10

Internet yes. […] when I'm feeling down, I need to self-soothe myself. I watch porn and I also download a lot of series. And yes, when I don't want to face the world and I'll just […] binge-watch. Participant 5

6.3.2.5. *Gambling*

While gambling was not a commonly reported substitute (n=1), it is interesting to note that it was concurrent with a now-terminated substance-based addiction to crystal methamphetamine. When engaged in gambling in active addiction, the primary substance was temporarily abstained and winnings were used to procure the drug of choice. In recovery the participant expresses ambivalence about the behaviour, viewing it as wrongdoing and as something necessary to conceal from her mother who would be displeased. Yet, gambling was said to be calming, a buffer against stress, a way of occupying the mind and elevating mood *despite losses.*

That was also part of my addiction, gambling. And now that I don't smoke anymore, now and then I still wanna gamble. And I know that's not right but […] it makes me feel better. That, even though I lose my money or, sometimes you win […] that calms me a little, takes all the stress away[…] When I went to gamble then I didn't worry about smoking tik. […] if I win, nah I must buy me my tik. […] I was there Saturday […] maybe for two hours […] But I had to lie to her (mother) […] Because she's not gonna be happy […] it just takes my mind off everything. Because you just focus on […] winning. Participant 16

6.3.2.6. *Stealing*

One participant reported grappling with stealing (n=1), a behaviour established in childhood, up to two and a half years into his recovery. The stolen money was said to provide

comfort. Contributory factors were said to include lack of engagement with his sponsor, poor meeting attendance and neglecting step work.

> *So, I was in recovery for two and a half years. […] I was slacking quite a bit with sponsor contact […] with meetings as well […] Step work […] It just happened as it happened in active addiction, where […] there was nobody around and I just started looking […] It's, like about that power […]that I connect with money […] It's about feeling less than, and about having money to buy things because then I feel comfortable. Participant 19*

6.3.2.7. *Work*

Periods of overwork were described by participants (n=3) for reasons such as relapse prevention, escapism and compensation for losses in active addiction.

> *Working to escape my feelings […] would probably be when I work to excess. […] I went from being a really top student to failing subjects. When I had to repeat those subjects. I sort of was sober and now wanted to redeem myself. […] Two or three months I definitely did overwork. Participant 7*

> *I totally became a workaholic […] I did two jobs and I was studying. So, I was keeping myself busy and that prevented me from using. Participant 10*

> *I was working extensive hours […] 47 hours overtime […] I still carry that title […] Overtime King. (laughs). […] though I was performing at work, at home I just want to sleep […] I am tired'… I am nasty […] My family started suspecting me of using because the behaviour is the same […] They made me permanent at work […] It scaled down a bit but […] didn't change […] From 7 'o clock the morning 'till 11 o clock at night. […] People […] say I'm trying to impress the boss, but […] my substitute addiction still makes my life unmanageable. Participant 20 (partially translated from Afrikaans)*

6.3.2.8. *Pornography, sex and relationships*

Pornography viewing, sexual activity and relationships (n = 5) were also identified as behaviours that came to the fore during recovery. One participant described the interplay of his SUD, sexual activity with sex workers and overwork. Now that he had abstained from his primary substance, his sexual activity, which had formed part of his addiction set was starting to impact his marriage as well as his work. His sex addiction was more private, with his wife only aware of his pornography viewing. He was distressed about the double life he was leading as a Christian and identified that the sexual activity was placing him in harm's way - one example of which was fatigue at work, where he operated dangerous machinery ("[…] people … died on the job already, in my department […] I put my life at risk. […]"). Work was also being used as an explanation for his absence from home when he was engaging

in extra-marital sex. His pornography consumption and sex dominated to the extent that he expressed: "My substitute addiction became my primary addiction". He anticipates that his sexual activity will ultimately lead to relapse.

> *My sex addiction, it's private. […] My sponsor suggested that I go to SAA meetings […] I went there, and […] thought […] I'm not as sick as this mense (people) […] but […] ek is (I am), […] I can't go back there because I'm not ready to admit to my wife […]. She thinks it's only porn […] Because I work a lot, I can say to her: 'I am working tonight'. But then […] I am involved with other things And, I know it's a matter of time before it takes me back to my first addiction. And for a long time now I haven't gone to houses, […] but it will never stop. […] It stops for one week […] You can't pray and you feel overwhelmed […] I know it's gonna fuck up my whole life […] You are now probably the first person that I really – like, even the people in NA […] don't know, […] one of the reasons I, I'm not […] connected anymore […] (it) takes me to dodgy places sometimes, and I'm putting my life at risk. […] (partially translated from Afrikaans) Participant 20*

An obsessive preoccupation with a romantic relationship may also be used to fill a perceived void or to derive self-worth.

> *A hole, there was like a part missing. I still have that feeling. And she kinda filled that part. She made me feel I meant something. […] I was obsessing about her every day […] I was checking if she was online […] because she didn't answer I felt rejected, and then I got angry, so I see my cycle now […] I'm still struggling, but it's not bad. […] I realize it when I'm going in that behaviour. […] I give my phone to […] my friend, or put it in my room […] or do something else. Participant 17*

Sex as a substitute may encompass pornography viewing or sex-based relationships, which may be used for distraction. Self-perceived pornography-related dysfunction may motivate abstinence.

> *Yes, I probably picked my partners because of the availability of sex […] It was just like how can I distract myself and that was probably the best way to do it. […] Ja, in early recovery I got into a lot of relationships. […] I've been without a relationship for […] two and a half years. […] I'm trying to be comfortable with myself and to find out that I'm enough. […] I struggle with intimacy. Participant 5*

> *Watching porn can be, used to be a bit of a problem. […] Early in recovery I was […] with this girl […] it's not suggested that you get into a relationship […] that was very unhealthy, and it was quite sex-based. […] The porn […] stopped uhm at a certain stage when I got the girlfriend that I have now […] I told her about it […] it caused me a bit of trouble like with arousal […] I decided I don't want this anymore. Participant 19*

6.3.3. Substitute behaviours and harm (reduction)

Participants believed that while the nature of the substitute behaviour was a key consideration in establishing its potential to harm, behaviours that are ostensibly healthy or

supportive of recovery could also lead to relapse. It was considered essential to recognize patterns in behaviour and to be able to determine whether the substitute made life unmanageable. It was believed that substitutes may threaten recovery by leading to relapse and by eliciting the same feelings; leading to losses and requiring dishonesty to maintain as did the abstained addictive behaviour. Lack of knowledge of the dynamics of a substitute behaviour could also harm.

These quotes express that relapse may gradually occur if a substitute becomes compulsive and works against the gains of recovery to make life unmanageable (again). The threshold for determining whether a behaviour is harmful was said to be its effects on the self and relationships.

> *By putting everything into my recovery, you learn about the balance that you were speaking about. So, it depends on what type of behaviour it is. And as long as the behaviour that you are taking on is not making your life unmanageable then it's okay. Participant 1*

> *If it becomes compulsive behaviour. […] Ruins your life […] ruins things that you applied in recovery. […] Becomes aggressive and you forget about other things within yourself […] That's the thing for relapse. Participant 2*

> *You can't stop yourself […] you are obsessing […] can't live your life, which makes your life unmanageable. […] resentful, angry […] ashamed, anything that's gonna make you feel like less. That is, you are still acting out on your addiction. Participant 18*

> *The test for finding out if it's harmful is like how it affects you (and) […] other relationships. […] Sometimes people go overboard […] because […] life is hard without drugs. […] You need something to kind of take the edge off or just to take your emotions away. […] There was a time I was doing […] recovery obsessively. […] Doing like a step a week. Meetings, sponsees […] doing service (laughs), heading into a step group […] distracting […] and convincing myself that I'm doing so well. But I really wasn't […] I was staying away from drugs. Ja. But […] life is much more than that. Participant 5*

These quotes show that the void of the terminated addictive behaviour may be filled with a range of behaviours, with not all being harmful or addictive. However, ostensibly healthy or unhealthy behaviours engaged by persons with a history of addiction were harmful as they could be justified and continue.

> *I mean if you had the choice between being a heroin addict or a Comrades (Marathon) runner, I'd rather go for a Comrades (Marathon) runner […] You are so used to having your soul, your identity's consumed by being an addict. You take that out, what's left? Sometimes the easiest way out is to give that person something. 'Okay you can't have heroin but here, have a cup of*

coffee'. So, I don't think it's always (harmful), but I mean the majority of the time, yes. […] There are some guys pursuing all kinds of weird things to keep them clean. Participant 4

If you're an addict […] you're always gonna substitute, […] make excuses, […] justify why you do things […] to keep on using. […] Anything that you do over-excessively is harmful. Whether it's a healthy thing or an unhealthy thing, it's harmful. Participant 3

The extract below demonstrates that whether the behaviour is regarded as healthy or not, it is always harmful to engage in it to the point of excess, and, while it may be more challenging to determine this in the case of behaviour, it was always negative to substitute one substance with another.

I think excess is always harmful. I mean even if it's something healthy like exercise. […] I can't think of a single example where substituting with a substance would be a good idea. […] The behaviours […] you can convince yourself a lot easier that it's healthy. Participant 7

According to participants, a substitute engaged in excess was harmful as it prohibited persons in recovery from being present and engaged in the here and now. Furthermore, any excessive behaviour was considered harmful or even potentially fatal.

If I do anything that takes me out of this moment, then I'm possibly engaging in unhealthy behaviour. […] sex addiction taught me […] I walked around in fantasy land in my head. […] even if I wasn't acting out on sex, I wasn't doing drugs, or I wasn't drinking […] I was very much in my own head doing my own thing. I wasn't here. Participant 8

Anything excessive could harm you. So, even if it's exercise. You're literally not dealing with the fact that you can't handle your emotions and your well-being on a level that's balanced. […] I do believe that in excess anything could kill you. Anything. Even denial. […] Participant 9

Excess. […] The largest majority of people know where the sober line is […] The small majority […] addicts and alcoholics uhm, I don't think we have that line. Participant 11

Participants also reported that the behaviour underlying the varied manifestations of addiction is more important than the addiction itself. If persons in recovery could recognise patterns in behaviour, and when they become 'obsessed', the disease itself could be addressed, and substitutes don't need to arise.

It doesn't matter what it is, we take it to the point of no returns. […] in NA we know, jails, institutions or death. I mean I was in jail, I was in an institution, mentally, spiritually, I was dead. […] if you want to change one for the other: good luck. […] You are just swapping one death for the next. […] One set of chaos […] for another one. Participant 21

[…] Addiction is addiction […] it's the disease of more. […] Sometimes it changes, uhm but it's the behaviour that needs to be focused on. […] when I become obsessed, does my thinking follow a pattern? […] Make a start recognizing this pattern. […] If you can deal with the disease itself,

there shouldn't be several addictions. […] A lot of the time […] people came to replace their active addictions with healthier things […], with exercise […] family life […] raising children […] it doesn't necessarily have to be toxic. Participant 13

Participants expressed that sometimes substitutes were detrimental to recovery. It may elicit the same feelings as did the abstained addictive behaviour, lead back to the primary substance or, lead to comparable losses. Disregarding the concern of others such as sponsors was seen as indicative of recovery potentially being in jeopardy.

Gambling is going to strip you of everything as the drugs did. […] If you're smoking heroin […] and now you're going to gamble […] that's still going to eat your money too because you're not always going to win. So, it can be harmful because you can lose your home […] your family […] everything […] (translated from Afrikaans) Participant 16

Just the act of defiance is already a danger. The fact that I listened to her (sponsor's) advice I'm still okay. […] If I just say: "Okay, I'm not going to do it". And then I just do it there is no way she is going to know, then I would know I was in trouble. Participant 10

It takes me back to that feeling of how I felt when I was in active. […] (I) stop being honest with myself. […] Definitely, it doesn't work. […] I don't think it really matters […] what the addiction is […] It's harmful to me because I'll get to a point where I'll say to myself it's okay? Participant 23

If you would use another substance […] it just triggers uhm, that feeling of more and I would ultimately go back to that substance (drug of choice) anyway. […] With me it always starts with alcohol. I will drink alcohol […] maybe a week later […] I would start smoking a joint. Participant 19

Finally, one participant spoke about the sub-cultures and paraphernalia linked to certain drugs of choice and the potential dangers of lacking 'expertise' in the aspects and dynamics of the substitute behaviour, bringing harm.

Each substance comes with their own kind of paraphernalia. […] In each clique there's different things that they do. So, it's dangerous if you know only this thing, when you go to other things you might get hurt. You can overdose. People can manipulate you in some strange ways. They can use you. Participant 6

6.3.4. Support needs to manage and resolve substitute behaviours

NA members offered a range of recommendations for service providers and those providing recovery support. Specifically, the importance of continued engagement with recovery support and the need to be educated about changes in patterns of behaviours that could progress to become substitute addictions was noted. Furthermore, participants advised

service providers to focus upon and process the underlying feeling states that may underpin addictive behaviours and add to or develop a repertoire of adaptive coping skills. Service providers were urged to establish whether co-occurring addictions or disorders are present as these pose a risk for relapse and substitution. Participants believed that as addiction is a disease, its manifestations vary. However, the relative harm of substitute behaviours may differ. Finally, service providers need to recognise that the support and guidance of peers in recovery may be particularly valued by some.

Ongoing engagement in recovery support programmes was deemed necessary as the potential for substitute behaviours to arise would always be there.

> *The disease of addiction [···] is not gonna disappear [···] It's always there. So, you are prone, uhm, to things and to do it excessively, but as long as you do a programme, you're vigilant of that. Participant 3*

> *If an addict doesn't stay in the programme and find daily relief [···] they will cross-addict [···] manipulate, lie [···] cover-up [···] another addiction. [···] Rationalize to themselves and to everyone else [···] that they are not addicted. It might start off slowly, quickly [···] progress. Participant 11*

> *I just really, really believe, a 100%, that as long as you are not connected to a power greater than yourself, there are always going to be substitutes and it doesn't matter what it is. Participant 1*

The importance of awareness and education was raised by several participants. Speaking to behavioural addictions specifically it was expressed that service users should be educated in a highly practical way about what would constitute healthy as opposed to excessive engagement in a behaviour. In the case of behaviours, some may be carried over from active addiction into recovery, and these should be addressed in the long term:

> *When it comes to process addictions [···] what's carried over, what has changed from the past? [···] Education [···] needs to [···] become bit more practical in recovery. What is a good amount of time to exercise? [···] What is a healthy meal plan? [···] What is a healthy exercise routine? Instead of just telling people [···] What entails a healthy sexual life? [···] What's normal? [···] We have no comprehension of what normal is. Participant 4*

As it was believed that the manifestation of the addiction could change, service users should be taught to identify patterns in behaviour. Furthermore, practitioners should seek to explore and educate service users as to why they sought out substance use initially (its

functions), and work towards capacitating them to confront what may be hidden by the addiction.

> *You must fight the underlying emotional state. […] it doesn't matter what you are addicted to. […] It's about what you're trying to hide. It's what you're trying not to see. […] Teaching […] how to emotionally capacitate themselves rather than trying to push down an addiction. […] Why they wanted something as a substance to use in the first place. Participant 9*

Emphasising the need for professional but also peer support, another participant viewed addiction as an effort to manage painful feeling states. This participant assigned a higher value to insights shared by persons in recovery, as they were said to better understand the lived experience of addiction than a trained professional.

> *Addiction for me is coping with pain. […] 'Addicts' who use […] it's their way of coping, they need to learn the the normal way of coping. […] The thing about NA […] if they tell me something out of their experience, maybe it works for me. […] Sometimes if someone like my psychologist […] would say […] try that […] What do you know? […] You don't know how my mind works. Participant 17*

To promote enduring recovery and prevent relapse it was deemed vital by participants to explore and establish concurrent addictions and disorders. Moreover, it is necessary to establish whether a mental health condition coexists with an addictive disorder, and may precipitate relapse when unmanaged. The importance of aftercare was also noted. Finally, participants encouraged providers to explore and prioritise secondary behaviours alongside the SUD, as these may intensify and become unmanageable in time.

> *"What else are you addicted to that you don't know about?" Because you can work on your drug addiction until you're blue in the face, but if you keep on acting out on sex, you're not going to be clean. […] "What co-occurring conditions do you have? Are you ADHD that's not being treated? Are you depressed? Do you suffer from anxiety? […]* Then *address the addiction […].*
> **Interviewer:** *Because the individual might be self-medicating?*
> *Yes. […] or you might be clean of substances. But if you're constantly anxious you are going to reach a point and say: […] "If I feel terrible the whole time […] Why should I not use?" Participant 8*

> *You think that you are down because you miss the drugs, depression becomes a big thing and you revert back to using because you can't handle it. Meanwhile, it's not the addiction […] it's your depression […] There's got to be a lot more effort put in into first dual diagnoses and also post-treatment work. Participant 12*

> *If someone says they're engaging in a behaviour but the behaviour isn't so serious. […] Encourage the person to really work on that thing […] Because that's the next thing that he's gonna focus on. […] I have this porn addiction […] I spoke to my counsellor about it, but for me it was, you're here for this (drugs) - 'let's now just focus on this'. But, actually, we needed to*

focus on that other thing also […] and try to get balance on it […] that thing is going to grow Participant 20

6.4. Discussion

Based on interviews with NA participants in South Africa, several respondents mentioned that substitute behaviours (including cigarettes, food, sex, exercise, coffee, shopping, binge-watching, work, stealing and gambling), developed across recovery stages. Substitute behaviours could be temporary or long-term replacements for SUDs. While substitutes were utilised for distraction, isolation, mood-modification, harm reduction or relapse prevention even ostensibly healthy behaviours could threaten recovery.

Given that abstinence-based recovery has historically excluded nicotine and caffeine (White & Kurtz, 2006), it is perhaps unsurprising that these emerged as common substance-based substitute behaviours among participants. Reich and colleagues (2008), in their study of 289 AA recovery support group members in the USA, found that levels of coffee and nicotine consumption exceeded that of the general population. Moreover, the quantities consumed were also larger amounts per capita. The effects of consumption as described by AA participants "suggest significant stimulation and negative affect reduction" (p. 1799). While negative affect reduction was reported by study participants as a motive for smoking, use was also attributed to the availability of money and reducing boredom. The continuation and escalation of cigarette consumption (White & Kurtz, 2006) highlight that smoking cessation should be a task in early recovery (Sussman, 2002).

Findings from the in-depth interviews suggest that although common in early recovery, substitutes arose at all stages of recovery. In one of the few such studies in the South African and broader African context, Stokes and colleagues (2018) conducted individual, face-to-face interviews to shed light on how participants sustained recovery was achieved. Affiliation with a 12-Step programme and acceptance of the 'disease' concept of addiction was found to support an enduring recovery (Stokes, Schultz & Alpaslan, 2018). Insofar as this concerns substitute behaviours and the narratives of participants in the present study, this may relate to how sponsors or fellow mutual aid members would raise a concern about (potential) substitute behaviours, which would prompt reflection and, in some

cases, action. Participants also emphasised belief in the disease model and used it as the basis for belief in different manifestations of the disease, and as a motive for accessing recovery support. However, this aligns more closely with The Syndrome Model of Addiction (Shaffer et al., 2004), which is explicit in its assertion that those with the syndrome are susceptible to substance- or behaviour-based addictive behaviours.

Substitute behaviours have been discussed in terms of their instrumentality in fulfilling heterogenous motives. The motives for substitution expressed by participants align with and extend earlier research. While the use of substitutes for time-spending, harm reduction, relapse prevention and coping, broadly construed, is commonly known (Horvath, 2006; Sussman & Black, 2008; Sinclair, Sussman, De Schryver et al., 2021), participants identified self-soothing, distraction, escapism and avoidance as motives. It is interesting to note that different substitutes fulfilled these same functions and that different motives could underpin the same behaviours. These patterns may also point to specific areas for building and developing alternative behaviours that represent adaptive coping. The extent to which individual expectations are met by behaviour and may reinforce the behaviour may lead to continued engagement or use of the substitute. However, participants' narratives also exhibit that while the risk remains that temporary substitutes may become long-term replacements, substitute behaviours can be time-limited (Sinclair, Sussman, Savahl et al., 2021).

Participants were of the view that behaviours, not all of which could be abstained (e.g. eating), needed vigilance and ongoing management. Accordingly, unmanageability or continued engagement in the face of harm to oneself or relationships was said to be an indicator of when a substitute behaviour has crossed the threshold to addiction. Griffiths (2013), while acknowledging that "loss of control" is defining of addiction for most, argues that for behavioural addictions particularly (e.g. work addiction) addiction may be present without loss of control. He further highlights the "ambiguity in our standard understanding of addiction (i.e., the ambiguity of control as ability/means versus control as goal/end)" (Griffiths, 2013, p. 2). Yet, "control (and loss of it) may be something that changes its nature over time" (Griffiths, 2013, p. 3).

Dual diagnosis and multiple addictive behaviours were two potential threats to recovery that were discussed by participants. Studies of persons receiving treatment for SUDs have demonstrated the co-occurrence of behavioural addictions both internationally (Najavits et al., 2014) and in South Africa (Keen et al., 2015). In the US, a sample of 51 service users receiving substance use treatment reported sex/pornography; eating; shopping/spending; work; computer/internet; exercise; gambling and self-harm as co-existing behavioural addictions. Correlations were also observed between some of the behaviours. Such multiple addictive behaviours are known to make the presentation and intervention more complex (Keen et al., 2015). Addiction Interaction Disorder (Carnes et al., 2005) suggests that the interplay between addictions may manifest in a variety of ways and that the addiction set is more harmful than are individual addictions. In the present study, one pattern of interaction entailed a secondary substance or behaviour escalating once the primary problem was abstained (e.g. cigarettes), or one behaviour was used to mask another (e.g. purporting to work long hours to engage in sex).

Participants described that feedback from sponsors and group members during meetings were features of NA that aided the identification and management of substitute behaviours. Sponsorship, having a peer with more time in recovery, is a central element of NA. Sponsors may listen to concerns and offer support, provide direct, honest feedback and, at their discretion, share their experiences (NAWS, 2004). Keeping contact and having a strong sponsor-sponsee alliance have been shown to predict abstinence and mutual aid participation (Kelly, Greene & Bergman, 2016). NA and indeed other twelve-step meetings provide a forum to share experiences of recovery and rely on the "therapeutic value" of one person with a history of addiction helping another (NAWS, 2014). As experienced members and newcomers alike share in meetings, emerging or established substitute behaviours may be seen in a new light.

Participants highlighted the importance of subjective experiences of substitution, and of how what may be regarded as a problem, may differ. All substitutes reported in this manuscript are those regarded by participants and the primary researcher as substitute behaviours. Some participants (e.g. Participants 16, 19 and 20) recognised behaviours that

predated their recovery, and endured, to be substitute addictions. However, others (e.g. Participant 13, 14 as regards their cigarette consumption) did not consider certain of their behaviours to be a substitution, as it was maintained at the same level as in active addiction. Notwithstanding individual experiences, we contend that behaviours that are 'held' at the same strength as in active addiction still potentially constitute substitute behaviours as they could still fulfil the function(s) of a terminated behaviour.

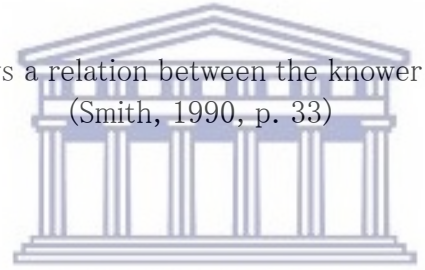
6.4.1. Clinical implications and limitations

Based on participants' interviews various clinical implications emanate from the study. First, within the relapse prevention plan, it is vital for persons in recovery to establish whether they have multiple addictive behaviours or dual diagnoses that need to be addressed. Second, in aiding in preventing, identifying and managing substitute behaviours, service providers should provide practical guidance on indicators that suggest that behaviours are being engaged problematically. Particularly in the case of behaviours, not all of which can be abstained (e.g. food), those that continue from active addiction into recovery, should be monitored and managed in the long term. Third, those in recovery should be educated as to the different pathways along which substitutes can arise.

The limitations of the study centre on it being conducted only in the Western Cape province. However, findings might be transferable to other contexts or a broader group (Yin, 2013). It is also noteworthy that all but four participants had received treatment for their SUD(s), some of whom had multiple treatment episodes.

Future research should be conducted among NA members in other settings and further qualitative and quantitative research should examine the interplay between substitute behaviours. Also deserving of further study are substitute behaviours in stable and sustained recovery.

"Knowing is always a relation between the knower and the known."
(Smith, 1990, p. 33)



Chapter 7

General Discussion

In this dissertation, I have examined the nature and dynamics of substitute addictions in the Western Cape, South Africa. This entailed (1) reviewing the extent, range, and characteristics of the literature on substitute addictions in persons with SUDs; (2) using an illustrative case, discussing COVID-19 related pornography use through the lens of substitute addictions; (3) prospectively examining the prevalence and types of substitute behaviours as well as associated predictors, correlates, and motivations in persons receiving residential substance use treatment; (4) exploring substance use service providers' perceptions of substitute addictions during and after residential treatment and (5) exploring Narcotics Anonymous attendees' perceptions of and experiences with substitute addictions.

In this concluding chapter, I will reflect upon the key findings of the PhD for the corpus of evidence regarding substitute addictions; a phenomenon described at least as early as the 1930s (Chopra & Singh Chopra, 1932) and concerning which waves of interest have been observed during past decades. I will consider here the contributions of the dissertation's theoretical frameworks; reflect upon the utility of its methodology and, finally, contemplate the implications of the study for clinical practice, policy and future addiction science research.

7.1. Overview of key findings across sub-studies

To the best of our knowledge, no previous South African study has explored substitute addictions before. The overarching aim of this study was to explore the nature and dynamics of substitute addictions from multiple perspectives in the Western Cape, South Africa. The study uses a multiple methods design and was conducted through five separate but interrelated sub-studies, guided by the following objectives:

- Objective 1 (Sub-study One): To review the available literature to understand the phenomenon of substitute addiction in persons with SUDs, identify gaps in the literature, and contextualise its features. A scoping review method was used.
- Objective 2 (Sub-study Two): To explore the experience of substitute addiction from a first-person perspective. A qualitative methodological framework and case study method were used.
- Objective 3 (Sub-study Three): To determine the prevalence of substitute behaviours and addictions among service users after inpatient substance use treatment. A quantitative longitudinal cohort design was used.
- Objective 4 (Sub-study Four): To explore service providers' perceptions of substitute addictions. A qualitative methodological framework and focus group discussion method were used.
- Objective 5 (Sub-study Five): To explore recovery support group attendees' perceptions and experiences of substitute addictions. A qualitative methodological framework and in-depth interview method were used.

7.1.1. *Objective 1 (Sub-study One): Literature review on substitute addictions*

Sub-study 1 utilised Arksey and O'Malley's framework for scoping reviews to scope the extent, range, and characteristics of research on substitute addictions in persons with SUDs up to April 2018. The 63 included studies show that the available literature is primarily concentrated in developed contexts. There exists no standard definition of substitute addictions and an array of terms are used to refer to it. Its aetiology is multifactorial and two sub-types appear to be discernible: long-term replacement and temporary replacement. The findings emphasise the importance of future multiple methods research particularly in LMICs and a pressing need to qualitatively explore experiences of substitute addictions to understand its potential consequences for recovery.

7.1.2. *Objective 2 (Sub-study Two): A case study of substitute addiction*

The COVID-19 pandemic, and measures taken to manage its impact, included an alcohol and cigarette ban in South Africa. Amidst global debate concerning the added challenges for persons in recovery and historical examples of the potential outcomes of forced abstinence, we considered the implications for substitute addictions and relapse. The case study detailed how one person, JP, in stable recovery from an alcohol use disorder had gradually replaced his alcohol use with pornography viewing. While already a long-term substitute, contextual factors including (reduced) recovery support potentiated relapse to pornography viewing. That is, the interplay of addiction behaviour-related factors (e.g., history), environmental factors (e.g., recovery support; accessibility of substitutes) and individual differences (e.g., stress; coping skills to manage stress) that may increase susceptibility to substitute addictions.

7.1.3. *Objective 3 (Sub-study Three): A longitudinal study of substitute behaviours*

Premised on the identified need for empirical studies on substitute behaviours in LMICs, this prospective study was undertaken with recipients of residential substance use treatment in the Western Cape, South Africa. Specifically, the prevalence and types of substitute behaviours as well as predictors, correlates, and motivations associated with substitution were investigated. The Brief Assessment of Recovery Capital, Overall Life Satisfaction scale, and adapted Addiction Matrix Self-Report Measure were completed during and post-treatment (n = 137). At follow-up, 36% of service users substituted their primary substance(s) with another substance or behaviour primarily for anticipated appetitive effects, for time-spending, (re)connecting with others, and enjoyment. A further 23% had relapsed (defined here as any use of the primary substance(s) after treatment) and 40% had maintained abstinence (of the primary substance(s) after treatment without taking on a substitute addiction). Those with mid-range recovery capital had a higher probability of displaying substitute behaviours as did those with the prospect of employment when compared to the employed or unemployed. The results highlight that targeted prevention and intervention efforts within treatment can reduce the risk of substituting.

7.1.4. *Objective 4 (Sub-study Four): A focus group study of service providers' perceptions of substitute behaviours*

Given the prevalence and potential impact of substitute behaviours for service users following the treatment-assisted recovery pathway, this study sought to explore the perceptions of substitute behaviours amongst substance use service providers. Service providers occupy an influential role in treatment adherence and related outcomes, yet globally and in LMICs little is known regarding their perceptions of substitute behaviours, potentially hindering service provision and recovery outcomes. Semi-structured focus group discussions (including 22 service providers across 5 residential treatment facilities) were conducted in the Western Cape, South Africa. Service providers recognised the potential for substances (e.g. cigarettes and caffeine) and behaviours (e.g. love, sex, gambling, exercise, eating, shopping and gaming) to be substitutes. Identified motives for substituting included managing cravings; time-spending; self-medication; legality and/or familial endorsement; masking feelings and emotions; filling the experiential void of the primary substance and social acceptance. Concurrent addictions in service users were identified as a key substitution mechanism and yet intake procedures did not include uniform screening for co-occurring behavioural addictions. As substitute behaviours were primarily considered a relapse risk, prevention, detection and education of the family were underscored.

7.1.5. *Objective 5 (Sub-study Five): An in-depth interview study of substitute addictions amongst mutual aid group attendees*

To elucidate the nature, motives and course of substitute behaviours in early, sustained and stable recovery, persons attending mutual aid groups offer an important perspective. Their insights into the nature, motives and course of substitute behaviours have the potential to shape recovery support services and facilitate recovery maintenance. Consequently, Narcotics Anonymous attendees were engaged in semi-structured in-depth interviews (n=23) in the Western Cape, South Africa. Four themes were identified: substitution with substances (cigarettes/vaping; coffee); substitution with behaviours (binge-watching; food; shopping; sex, relationships and pornography; exercise; work; gambling and

stealing); substitution and harm (reduction), and recovery support needs to manage and resolve substitute behaviours. Respondents identified that substitute motives were time-spending; self-medication; to fill a perceived void; mood modification; to isolate, distract and calm themselves and harm reduction and relapse prevention. However, even ostensibly healthy behaviours were believed to be potential threats to recovery posing a relapse risk. As study participants developed temporary or long-term substitute behaviours across recovery stages, ongoing vigilance and self-monitoring were said to be essential. In doing so, substitutes that became problematic or genuine addictions could suitably be addressed.

7.2. Cross-cutting findings from this multi-method, multi-perspective study

This study has been presented as a multi-method and multi-perspective study. While offering different perspectives, service users, mutual aid attendees and service providers are *not* mutually exclusive groups. There is substantial overlap between these groups as mutual aid attendees may have received treatment previously and some service providers have a lived experience of addiction and recovery. The key findings of this dissertation are summarised below:

7.2.1. *Terminology*

The concept of substitute addiction is terminologically and conceptually vague. The review undertaken in Chapter 2 revealed at least fourteen terms that are used to refer to the phenomenon, the most frequently used of which are 'substitute addiction', 'cross addiction', 'substance substitution', 'switching addictions', and 'substitute dependency'. From the focus groups with service providers (Chapter 5) and in-depth interviews with NA participants (Chapter 6) the most commonly used and widely understood term is 'cross addiction'. However, these terms are not synonyms. 'Substance substitution' suggests that the substitute is a substance (e.g. Dostanic et al., 2008), whereas 'cross addiction' appears to be used interchangeably for behaviours and/or substances as replacements (e.g. Procopio, 2005; Kezwer, 1996).

7.2.2. *Definition*

No single definition or common conceptualisation of substitute addictions emerged. In literature where it has been defined, it has historically referred to (specific) replacement substances (Moore, 2010; Simpson et al., 1982; Sokolow et al., 1981; Staiger et al., 2013; Subbaraman, 2016), but has also been used to refer to behaviours (or substances) as substitutes (Ali, 2015; Buga et al., 2017; Tadpatrikar & Sharma, 2018; Sussman & Black, 2008). We have specified the replacements as substance-to-substance substitution and substance-to-behaviour substitution. As the reviewed studies seldom provided an operational definition, their parameters were often open to interpretation. Therefore, Chapter 2 concluded with a definition of substitute addiction as "*the immediate or gradual functional replacement of an addiction or set of addictions that have been terminated*" (Sinclair, Sussman et al., 2021, p. 692). Further parameters we established were that substitute addictions were not intentional, nor treatment-related (e.g. Methadone Maintenance Treatment; Nicotine Replacement Therapy; medical marijuana). Furthermore, a necessary condition for our conceptualisation was that abstinence from a substance was required and that patterns of consumption where one addictive behaviour precedes another but has not abstained, do not constitute substitution. Thus, it also excluded the use of a substance or behaviour to complement another addictive behaviour (e.g. O'Hara et al., 2016). This exchange of one addiction for another could occur at different times (see Savitt, 1954; Verinis, 1986; Friend & Pagano, 2004). In Chapter 4, this initial definition was further elaborated, by specifying that substitute behaviours lie on a continuum with everyday behaviours on one end to addictive behaviours on the other. These addictive behaviours, in turn, vary in severity. These parameters were further refined to specify that replacement led to increased use and/or engagement. To avoid inflating rates of substitution, it should be accompanied by self-perceived addiction following abstinence from the primary substance(s) (Sinclair, Sussman, De Schryver et al., 2021).

7.2.3. *Types of substitutes*

The most commonly reported substance-to-substance substitutes were alcohol (Chapters 2, 4 and 5), cigarettes (Chapters 2, 4, 5 and 6), coffee/caffeine (Chapters 2, 4, 5) and cannabis (Chapters 2, 4, 5). Less common substitutes were prescription medication, amphetamines, barbiturates, cocaine, and opioids (Chapter 2), painkillers and crystal methamphetamine (Chapter 5) and vaping (Chapter 6). In terms of alcohol and cigarettes as substitutes, and amidst South Africa's high rates of alcohol consumption (Fontes Marx et al., 2021), the likelihood of drinking or binge drinking has been found to increase with cigarette smoking (Vellios, & Van Walbeek, 2017).

A diverse array of behavioural substitute addictions came to the fore across the multiple methods. The most frequent were: pornography use (Chapters 2, 3, 5 and 6), sex (Chapters 2, 4, 5 and 6), binge-watching (Chapters 2, 4, 5 and 6), work (Chapters 2, 4, 5 and 6), food (Chapters 2, 4, 5 and 6), love (Chapters 4, 5 and 6), exercise (Chapters 4, 5 and 6), gaming (Chapters 2, 4 and 5), shopping (Chapters 4, 5 and 6), religion (including prayer, mystical belief and meditation (Chapters 2, 4 and 5) and internet use (including mobile phone use and social media; Chapters 2, 4 and 5). Gambling (Chapters 5 and 6), self-harm (Chapter 4), stealing (Chapter 6), AA attendance (Chapter 2) and hobbies (Chapter 2) were less frequently reported. While behavioural addictions were rarely examined in the reviewed articles, their occurrence and features were illustrated in the case study and were the most prevalent type of substitute in the quantitative sub-study. Love, the leading substitute reported by service users, was also believed to be the leading substitute they saw in practice by service providers at least in one focus group. Substitutes such as love open the discussion about the relative harm of substitutes. While love addiction is highly prevalent in some studies (e.g., Sussman et al., 2015), not enough evidence is available to formalize it as an addiction (Sussman, 2010). Nonetheless, substitute behaviours are not always problematic, nor should they necessarily be problematized. In some cases, and concerning certain behaviours, substitutes are potentially harmful in the long or short term. However, specific behaviours also aid recovery (e.g. work, love and relationships, religion) and finding meaning in life. We emphasise thus that there is a need to differentiate between negative,

harmful substitutes and harm reduction/recovery supportive substitutes. Congruent with anecdotal evidence, cigarettes were the leading substitute reported by NA members. While pornography use was amongst the most frequently reported substitutes in this study, data on its usage in Sub-Saharan Africa are limited. Statistics generated from Pornhub, an internet pornography outlet, indicate that in 2018 South Africa appeared in their top 20 list of consumers. As in Sweden, Russia and the Philippines, persons aged between 25 and 34 years in South Africa accounted for 38-42% of all viewers (Rowland & Uribe, 2020). However, any consideration of sexuality and the internet must also consider the combination of anonymity, access and affordability or 'Triple A' factors (Cooper, 1998).

7.2.4. *Motives*

In the sub-studies, a range of motives for engaging in substitute behaviours emerged. The leading motives to converge across perspectives were: relapse prevention (Chapters 2, 5 and 6); harm reduction (Chapters 2, 5 and 6); coping (Chapters 3, 4 and 6); managing craving (Chapters 4, 5 and 6); time-spending (Chapters 4, 5 and 6) availability and accessibility (Chapters 4 and 6); self-medication (Chapters 5 and 6); filling the experiential void left by the absence of the primary substance (Chapters 5 and 6); social acceptance (Chapters 5 and 6); and guilt and compensation (Chapters 5 and 6). The study showed a range of novel motives for substitution and addresses the need for identifying participant-driven motives rather than categories/responses pre-empted by the researcher (Shapira et al., 2021).

7.2.5. Mechanisms and interplay between addictions

Persons with SUDs were found to employ substitute behaviours temporarily or over a long-term period. *Temporary replacement* occurred when there was forced abstinence from a primary addictive behaviour, while *long-term replacement* represented one addiction functionally replacing another (Chapter 2). Service providers did not frame substitution as a potentially time-limited activity, or as a tool that could be leveraged (depending on the nature of the substitute behaviour). Rather, short-term substitutes were those engaged until

a ‘suitable’ substitute was found that yielded desired appetitive effects (Chapter 5). A substitute may be:

- initiated in recovery (Chapters 2, 4, 5 and 6);
- maintained at the same level as in active addiction (Chapter 6);
- escalating, regardless of whether initiated in recovery or maintained during active addiction (Chapters 2, 3, 4, 5 and 6);
- tapered off and quit (Chapter 6);
- come to the fore periodically (Chapter 6) and
- the less socially accepted, but *true* primary addictive behaviour (Chapter 5).

‘Old’ or ‘new’ behaviours can serve as substitutes and these are not only related to the abstained behaviour as had been reported previously (Castro-Calvo et al., 2018). Substitutes can be less harmful or become even/more harmful than the primary problem (Chapters 2, 3 and 6).

7.2.6. *Onset*

The data illustrate that the onset of substitute behaviours may be immediate or gradual. Substitutes may appear in early recovery (e.g. Cowan & Devine, 2008; Verinis, 1986), either starting in treatment or being initiated immediately post-treatment (see Chapters 4, 5 and 6). However, substitutes also emerged throughout recovery (see Chapters 2 and 6). Onset in early recovery could be due to a concurrent behaviour, escalating with abstinence from another substance or behaviour. While certain behaviours may be expressed during treatment, substitute behaviours may only be detected during aftercare.

7.2.7. *(Un)Conscious substitution*

In the present study, most substitutes appeared to arise consciously. Chapter 2 shows intentional substitution to prevent relapse to alcohol and in other studies, it is unclear whether unconscious substitution is depicted. Service users (Chapter 4) used substitutes consciously for a range of anticipated effects and functions and to a lesser extent for unconscious reasons or being unaware of why. In Chapter 5, substitutes were believed to

emerge gradually or immediately upon abstinence to (un)consciously fill the experiential void of the (terminated) primary substance. Some service providers regarded substitution as a neurobiologically unconscious and automatic process. In Chapter 6, substitute behaviours were engaged primarily consciously, and for some, were deliberately concealed from others. One explanation for the instrumental use of substitutes may be that adaptive coping skills are limited. While a lack of effective coping mechanisms has been linked to relapse (Swanepoel et al., 2016), it is important to consider the relative harm of the substitute before concluding that relapse is imminent (Horvath, 2006; Sussman & Black, 2008).

7.3. Evidence against substitution

While this dissertation yielded vast evidence in support of the occurrence of substitute addictions, it also demonstrated that substitute addictions are not a concern for all persons in or seeking recovery. For example, in Chapter 2, various reviewed studies did not detect substitute addictions (Darke et al., 2006; Fairbank et al., 1993; Kadden et al., 2009; Koball et al., 2019; Miller et al., 1983; Stephens et al., 2000). Furthermore, in Chapter 4, while it is plausible that those that relapsed (23%) had engaged in a substitute behaviour 36% reported to have substituted, 40% of the participants reported neither substituting nor relapsing and were still abstinent from their primary substance(s). Finally, in Chapter 6, four recovery support group attendees (two of whom were in sustained recovery and two in stable recovery) did not believe that they had ever substituted their primary addiction. These behaviours may have been maintained at the same frequency as in active addiction or have become more frequent. However, it was also believed that even when highly engaged, behaviours were not necessarily substituting and that unmanageability was an important indicator of risk. We concur with Shaffer, Toneatto and Ladouceur (2005, p. 303) that "many individuals recover from an addiction and do not transfer their addictive tendency to another behaviour. Certainly, this does happen, but of course, it may not be true for everyone". However, how substitutes are conceptualised (see Blanco et al., 2014, who did not consider behavioural substitutes) remains a key factor in its assessment and detection.

7.4. Contributions of theoretical frameworks

A myriad of theories has sought to account for addictive behaviours. These vary in the factors they foreground biological factors, psychological factors, social-environmental factors or an integrated biopsychosocial perspective (Ogborne, 2004). How one thinks about (substitute) addiction influences the selection and application of theoretical frameworks. Two of the theoretical frameworks that offer promise for understanding substitute addictions and explaining ways in which they can be addressed effectively are the PACE and Syndrome Model.

As outlined in Chapter 1, the PACE model (Pragmatics, Attraction, Communication, and Expectation) draws upon situational, genetic, learning and ecological variables to account for the apparent preference for one addictive behaviour over another (Sussman et al., 2011). A complimentary model, the Syndrome Model (Shaffer et al., 2004) posits that multiple (potential) expressions of addiction are indicative of an underlying addiction syndrome, such that the object of addiction can oscillate between a substance and/or behaviour. Although not developed in the South African context, both theories have proven to have applicability and utility in the study setting and have been indispensable for making sense of the (non-)occurrence of substitute addictions. For example, there is a clear alignment between the availability and accessibility motive uncovered in this study (Chapters 4 and 6) and *Pragmatics*. *Attraction* is also a plausible explanation for conscious substitution (e.g. Chapter 6), given that specific behaviours are likely sought out which were more or less attractive to participants based on their characteristics. Similarly, behaviours initiated in treatment (Chapter 4) may continue as service users are attracted to their known effects. Prior experience with an activity is an important factor in the 'selection' of substitutes. It is conceivable that respondents had the requisite communication skills, as one participant highlighted the potential risk of not knowing certain conventions within a group of people who may engage in addictive behaviours and lacking expertise in the dynamics of substitution (e.g. Chapter 6). Finally, *Expectation* and reliably having one's expectations met explain why some substitutes become long-term replacements (Chapters 2, 3 and 6).

As the theory allows for contextual factors to be integrated, it enabled the identification of a range of motives and maintaining factors for substitution. Looking now to the Syndrome Model, participants highlighted several proximal and distal factors that had exposed them to their substance of choice and potential substitutes (Chapters 3, 5 and 6), demonstrating the interplay of biological, psychological, socio-environmental and addiction-related factors (Griffiths, 2005). The neurobiological parallels between substance and behavioural addictions, as highlighted by participants, remain an ongoing topic of investigation and debate (Leeman & Potenza, 2013).

The two theories provide what Griffiths (2005) refers to as 'global' models of addiction. Global models acknowledge the interplay between biological/genetic predispositions; psychological factors (attitude, belief, expectation, personality and motivation); situational/ environmental influences and the characteristics of the potentially addictive behaviour. In doing so, they transcend a singular biopsychosocial approach (Griffiths & Karanika-Murray, 2012, p. 92). "These many factors highlight the interconnected processes and integration between individual differences (i.e. personal vulnerability factors), situational characteristics, structural aspects, and the resulting addictive behaviour" (Griffiths & Karanika-Murray, 2012, p. 92), a critical consideration in the highly diverse South African context and beyond.

7.5. Reflexivity and positionality

Reflexivity, here defined as an "explicit, self-aware meta-analysis" of the researcher's role (Finlay, 2002, p. 531), is premised on the idea that "researcher and participant subjectivities are fully implicated in the (co)-construction of knowledge and should therefore be documented and made retrievable" (Suffla, Seedat & Bawa, 2015, p. 9). I believe that a key strength of this research is that I was fully immersed in the data as the sole data collector, except for four jointly conducted interviews. I interacted with each service user, recovery support group attendee, service provider and the case study subject.

While an analysis of positionality will not equalise power dynamics between the research and the 'researched', it requires interrogation of taken-for-granted assumptions

and beliefs, as well as stereotypes (McCorkel & Myers, 2003). Moreover, while race, class, and gender serve as proxies for more complex and precarious elaborations of identity, relationships and power in the complex South African society, the implications of such markers of identity and difference must be explored (McCorkel & Myers, 2003).

In the South African context, I am a 'Coloured', lower-middle-class female. With postgraduate training in addiction care and research psychology, my fundamental understanding of substance use and behavioural addiction is profoundly shaped by the literature as well as practical experience of working within a substance use treatment setting. Yet, my personal experiences of witnessing substance use within my community have also informed my conceptualization of addiction and recovery. I have lived on the Cape Flats, a geographically and historically politically designated area within the Western Cape province to which the apartheid government had forcibly moved many disenfranchised people, since the age of 9 (Haupt, 2021). The region has been characterised by gang culture, intertwined drug trade, and pervasive use of crystal methamphetamine (Pasche & Myers, 2012). Thus, the image of substance use and addiction to which I was exposed in my community was a very particular one and one where recovery is virtually invisible. In January 2010, I began a six-month counselling internship at an outpatient substance use treatment facility, only 6 km from my home. While I was particularly unsure of myself in its initial stages, I eventually found my voice and the more I learnt about substance use and treatment, the more confidence grew to conduct individual sessions, co-facilitate group sessions and psycho-educational lectures as well as family workshops. Something I had to reconcile for myself was that while I too live(d) on the Cape Flats, my (emerging) knowledge of addiction could instil hope, could direct someone to suitable help and, with referrals, could enable some to receive a diagnosis or medication, or link up to resources. This is not to suggest in any way that the process was easy, but it was certainly rewarding. Perhaps most importantly, over those six months, while I saw relapse, I also saw recovery. Since my time as a service provider, further training, mentorship and reflection have been critical for expanding my theoretical horizons concerning recovery. Whereas in my counselling internship treatment could be terminated for failing to achieve abstinence within the early stages of the programme, I now know that

abstinence may not be possible for everyone, or desired. What if the treatment programme had viewed service users using less as a sign of change, of recovery, or steps toward recovery? A 3-month training opportunity in the U.S. and a later long-term research stay in Belgium both led to mentorship from addiction experts. The many formal and informal, ongoing, and critical conversations about addiction and recovery have been pivotal in my process of making sense of the dissertation's data.

From the vantage point of the two disciplinary frameworks within which I situate my research: Psychology (UWC) and Orthopedagogics (UGent), I here wish to emphasize my experience with the latter, which was also new to me. Orthopedagogics is premised on the inclusion and actualisation of persons in marginalised situations such as individuals with SUDs. Resonant of the principles of community psychology, in aiming to improve QoL it seeks the active participation of beneficiaries and foregrounds individual strengths rather than deficits. A distinguishing feature of Orthopedagogics is that it is the study of the action/intervention to improve people's situations; a focus on action/working collaboratively is central. Through a collaborative approach, service users and service providers draw upon the experiences and expertise of the service user to set desired goals (Vanderplasschen et al., 2015). An individualized approach rather than a "one size fits all" intervention is adopted, one that seeks to support and involve service users and their contexts (Tarter, 2009; Vanderplasschen et al., 2015). I experienced this orientation as complementary to psychology. Furthermore, conducting the interviews jointly with a Master of Educational Sciences student facilitated discussion and interpretation of the findings.

With each participant group, achieving optimal participation, and establishing good rapport were essential. Different facets of my identity were "in play" during various interactions (McCorkel & Myers, 2003). There were several instances where I was required to adopt a seemingly passive role when setbacks arose, for instance, displaying a willingness to reschedule follow-up interviews multiple times; as often as may be necessary (Chapter 4). For example, on one of several occasions where an interview was confirmed and later fell through, I phoned a participant who had confirmed an interview earlier and the evening before to check that they were still able to meet as planned that morning. Though they'd confirmed

our interview, after my one-hour drive to the venue, they did not show up. The most challenging aspect was the follow-up interviews and the variance in where participants were at in their lives post-treatment. I also experienced participants that had relapsed, some of whom were facing complex and serious problems, ensuring that they were still available for the interview. I too had a network of participants that had completed interviews with me that continued to send me messages of encouragement because they were so invested in my succeeding in my task. What can be said concerning power dynamics?

While I shared demographic factors with a number of my participants, which fostered rapport, and used certain 'insider' language, as someone 'at university', some participants were also direct in asking me for employment. Moreover, because of unemployment post-treatment, offering to pay the taxi fare or reimbursing the incurred travel expense of the participant, although small, helped many to attend an interview. On the other hand, as I 'needed' the interview, participants were also powerful in our interactions as my doing the interview was directly contingent upon their willingness to cooperate or allot time to see me. In still other instances, I was asked for guidance on how to seek treatment or recovery support. Thus, while my data collection was arranged in such a way that my participants as experts by experience could meet me where I was at with my academic training in addiction to co-create their stories, there were times when I had to step into the role of counsellor, or of someone that understood the treatment system ('outsider'). At the end of the data collection appointment, I would refer participants and/or process some of the relapse risks they had highlighted. I also received phone calls from family members, and while I was careful not to disclose any confidential information, it struck me that many did not know that they too could seek support for themselves, or what services were available for themselves or loved ones. Thus, in doing formal and informal referrals, I was 'the researcher from the university', the 'professional' that knew where to access help. Power dynamics were constantly in flux.

While collecting data has, at times, proven to be immensely challenging, it has also been profoundly enriching. I've conducted interviews in participants' homes, in coffee shops, at treatment facilities, in restaurants, at workplaces and even on the roadside. I felt and feel

a tremendous responsibility to give voice to my participants, many of whom afforded me the privilege of hearing their stories with the express purpose of helping others and giving meaning to their experiences. The following excerpts from emails to my supervisors elucidate some issues and challenges of doing interviews at participants' homes:

Participant 4 is a 22-year-old female. At T1 she reported having used Tik, Mandrax, Cannabis and cigarettes. As she is presently unemployed, she preferred for the interview to be conducted at her home; I asked only for privacy so that we could speak freely. When I arrived at her place, she welcomed me at the gate but her daughter (aged 5) was tearful and when I queried why she asked if I was coming to take her mother away. I explained to her that I was just there to chat with her and that she would not be going home with me. At this juncture I need to add that: (1) the house is (attached to) a liquor outlet/shebeen and (2) the house is one street away from the facility in (area) I've been working with, but she was a service user in (another region). I had good rapport with this participant, but something that impacted the interview was that her mother remained within earshot through most parts of our conversation - I couldn't do anything about this, but one thing that helped was that I had given her a blank questionnaire to follow along with and when it came to the question regarding love and sex 'addictions' I could simply point at the item and she responded, laughing and hurriedly. […] I was puzzled by how a home that is also a liquor outlet could be regarded as a highly supportive space and she said that although they sell alcohol, nobody drinks. She also indicated to me that she knows that alcohol can lead one to relapse. […] The daughter hugged me when I left and also engaged with me during the interview to show me her games. (21 October 2019)

Participant 7 is a 23-year-old female with Tik and Mandrax reported as primary substances of choice at T1 and cannabis and cigarettes as other substances of use. I conducted the interview at home - I am trying my best not to do this, but I got the sense that finances were an issue. Her Dad was her contact person and he was really very responsive from my initial contact and even phoned me to let me know that we needed to postpone as she had a job interview/ had gotten a job and needed to sign. I was introduced to her sister, who was within earshot and for the most part present, but this couldn't have been more different than the interview where the mother didn't allow me to speak to the participant privately. Upon seeing her I could tell that the sister was either very ill or was also using - withered face and very underweight. So, while she was physically present, she really didn't have much of a bearing on the interaction at all - she didn't speak at all until I was leaving […]. As the interview came to an end I asked: Why do you think you relapsed? Because after being clean in the two weeks after treatment, she worked and came into money and then was triggered. Given that she had just started working a 6-month contract this week, I asked how she was going to manage money and there is no plan in place. How do you feel about your sister using, you live in the same house? This part affected me. She expressed that her sister is HIV+ and that when she uses, men 'take advantage of her' - I didn't ask for elaboration. She further expressed that while she doesn't like that her sister uses, they have used together before and that she would prefer for her sister to use at home and away from men. […] I did a bit of psycho-education around aftercare. (1 November 2019)

Face-to-face debriefing during the first phase of data collection (Chapter 6), as well as emails to supervisors, helped me process these experiences.

When I consider my interaction with service providers (Chapter 5), my identity was also that of someone who straddled the line between being an insider and an outsider. To establish rapport, it was essential to have participants understand that I was not there to evaluate their programme, but rather to learn from them. I emphasised the importance of service providers' roles. Having an 'insider' perspective also necessitated understanding that rates of burnout are high amongst service providers and that flexibility would also be required to complete focus groups:

I arrived early for the second group but the turnout was poor - despite me confirming in advance - so I rescheduled to Friday as it is their admin day, and more people would be available I was told. […] One staff member that is clearly suffering from burnout was a bit of a disruptive force - which is fine because I just dealt with it - was the main obstacle here. I spoke to the manager, who has been wonderful to deal with, to formalise the rescheduling. (19 June 2019)

How can this research be used to advance circumstances in my community? An essential aspect will be to ensure the accessibility of the findings for various consumers. As data for two sub-studies were collected from treatment facilities (Chapters 4 and 5), one avenue has been to share outputs published to date, and I have further committed to doing a presentation/having a discussion with staff. Regarding the research findings of the mutual aid group attendees engaged in the study (Chapter 6), I intend to share the related publication with their national office, as well as distil the findings into a brief piece in their monthly magazine. Participants and other members can then consider this phenomenon when listening to shares in meetings, when sharing themselves or when sponsoring another member. The case study subject (Chapter 3) had access to and agency over his story by reading and approving how his story was cast in advance of its publication.

7.6. The relation between substitution and recovery

Our findings add to the knowledge base on recovery by elucidating that substitution potentially fosters or threatens recovery. While substitutes may promote recovery (Chapters 2, 3 and 6) and be relatively less harmful than the primary addictive behaviour (Chapter 6), they may themselves become an addiction and/or heighten relapse risk (Chapters 5 and 6). These different trajectories demonstrate that ongoing vigilance is necessary concerning

former, current, and new behaviours. Given the prevalence of relapse globally and in South Africa (Swanepoel et al., 2016), substitute addictions are a highly relevant topic of study. In South Africa, more research is needed on recovery and specifically relapse rates, its contributory mechanisms and people who relapse (Dada et al., 2015; Swanepoel et al., 2016). We speculate that the endemic poverty and inequality in South Africa may differentially impact substitution. For many, poverty and unemployment have been implicated in the aetiology of substance use (Ramlagan et al., 2010) and the widespread availability of cheaply accessible substances (Mahlangu & Geyer, 2018). While this may lead some to substitute, it would simultaneously preclude the availability of other addictive objects. While not discounting the impact of socio-economic status, the association between low and moderate self-reported levels of recovery capital and relapse and substitution respectively (Chapter 4) highlights that community recovery assets are to be developed and leveraged.

7.7. Strengths and limitations of the study

These results must be considered against the backdrop of the study's limitations. First, the 33.8% (n = 70) loss to follow-up of service users assessed during and after treatment (Chapter 4) may have biased the findings of the cohort study (Scott, 2004). A longstanding challenge in longitudinal studies is minimizing rates of attrition (Bootsmiller et al., 1998; Desmond et al., 1995; Walton et al., 1998; Scott, 2004). Participants who cannot be located and interviewed are commonly assumed to have relapsed (Walton et al., 1998; Desmond et al., 1995). While certain reasons for loss to follow-up in the present study were beyond the control of the researcher (e.g. participant death [n = 1]; being institutionalized [n = 3]; displaying acute psychiatric symptoms [n = 3]; and being missing/whereabouts unknown [n = 4], others could potentially have been addressed. The three leading reasons for attrition in this study were unwillingness to participate (n = 22); obsolete/incomplete contact information (n = 20) and unsuccessful efforts to reach respondents (n = 17). Earlier studies have shown that participants may become unwilling to be re-interviewed (Cottler et al., 1996) or that baseline locator information can become obsolete at any time (Scott, 2004) or be incomplete (Cottler et al., 1996). The unsuccessful efforts to reach respondents in this study arose from

uncooperative contact persons (n=7); cooperative contact persons but failed efforts to reach participants (n=9) and lost contact between the participant and contact person (n=1). Participants who have relapsed may become disconnected from the contact names they have provided to the researcher while in treatment (Walton et al., 1998) or contact persons may hinder access to participants (Cottler et al., 1996). Future research in South Africa could improve follow-up rates by adopting the following strategies:

1. To encourage participation, we recommend that incentives are provided. While monetary incentives have been provided in numerous follow-up studies (e.g. Vanderplasschen et al., 2010; Walton et al., 1998), given the fact that the availability of money was linked to substitution in this study this was not deemed appropriate (Chapters 4 and 6). Grocery vouchers and necessity items such as toiletries may be a more suitable incentive. Researchers should be aware that participants value the relationship with the interviewer over material incentives (Bootsmiller et al., 1998).
2. Based on my experience (Chapter 4), the relationship established with service users is central to the quality of the interview and the depth of information elicited. Researchers doing work on substance use have been cautioned against "acting superior" and "talking down and being condescending" to participants (Bell & Salmon, 2011, p. 88).
3. To better ensure up-to-date, complete contact information for participants, we suggest that locator information include home addresses. While at-home interviews spare participants' transport costs, it could present safety risks for the researcher (Walton et al., 1998). Alternatively, participants' transport costs should be reimbursed (with participants informed thereof in advance).

Also, the study did not investigate certain factors that could dynamically influence substitution, such as participants' co-occurring mental disorders. SUDs are known to be highly prevalent among persons with severe mental illness (RachBeisel et al., 1999; De Ruysscher et al., 2017). Moreover, recent evidence building upon our review (Chapter 2) has found an association between mental health disorders and substitution (Kim et al., 2021).

Further, in the absence of ecological momentary assessment-type (real-time) data, it was not possible to determine whether a substitute was temporarily engaged in and led to relapse in those participants reporting relapse (Chapter 4). Ecological momentary assessment data have demonstrated that drug-related cognitions and cravings for drugs have been associated with relapse (Marhe et al., 2013).

Additionally, given the importance of the context for the acceptability and availability of substitutes (Chapters 5 and 6), as well as recovery capital assets, the Western Cape province should not be taken to represent South Africa, given the pervasive inequality (e.g. Webster & Francis, 2019).

Yet, and notwithstanding the aforementioned limitations, the study has many strengths. This study demonstrates the value of integrating multiple perspectives and multiple voices on substitute addiction. Each perspective provided unique insights into the array of factors that influence this complex phenomenon. Multiple methods leverage and combine the strengths of quantitative and qualitative methods (Morgan, 1998) to generate "stronger results, larger contributions, and greater impact" (Stewart, 2009, p. 382). Using multiple methods thus enabled a description of substitute addictions, as well as a view into contradictions. Furthermore, the choice of multiple methods over mixed methods enabled data collection in a sequence that the contextual factors permitted. As each sub-study was self-contained, their sequence was not fixed. For example, while Chapters 3, 4, 5 and 6 involved human subjects and required ethics clearance before data collection, access to service providers (Chapter 5) and service users (Chapter 4) necessitated a second ethics clearance from the governmental department. While this is to be understood as persons who use substances are considered a vulnerable research population to be protected (Bell & Salmon, 2011), ethics committees convene only periodically. Therefore, the research design was amended and data collection for another sub-study was prioritised (Chapter 6).

7.8. Implications of the study

This study lends itself to various implications for clinical practice, policy and addiction research.

7.8.1. Clinical practice

Substitute addictions raise a wide array of issues impacting the support of people with SUDs seeking recovery. Research translation, the deployment of research findings for practical application in the prevention and treatment of SUDs, is thus an indispensable element of ensuring the uptake of the findings into practice and broader societal impact (Tarter, 2009).

7.8.2. Implications for prevention

In the South African context, equipping service providers to recognize that substitute addictions may arise and how they may manifest is critical for prevention and detection within treatment-assisted recovery pathways. One way in which this may be done is through Continuing Professional Development (CPD). The Health Professions Council of South Africa (HPCSA) and South African Council for Social Service Professions (SACSSP), the leading organizations with which service providers are registered, require that all members accrue CPD points to update and advance their knowledge and competencies (HPCSA, 2017; SACSSP, 2019). Group, individual and online CPD activities need to be arranged on the topic of substitute addictions and attendance should be incentivised to stimulate participation.

We recommend that service providers elicit a comprehensive (substance and behavioural) addiction history and conduct a systematic assessment of biopsychosocial risks and assets at intake (Buga et al., 2017; Chiauzzi, 1991). Chiauzzi (1991) proposes that such a risk analysis incorporates 1) historical factors (treatment, family, relapse and self-help history, as well as any history of substitute addictions); (2) biological risk factors (e.g. health factors); (3) psychological factors (e.g. coping skills and psychopathology); and (4) social factors such as the stability of relationships and the environment.

A dedicated component of treatment should engage the family of persons seeking recovery. Family and concerned others can be enlisted to support recovery by being educated about relapse prevention and substitute addictions, as well as being informed about

available resources. For treatment to be fully attuned to the needs of service users, these elements must be integrated into an individualized (and ever-evolving) treatment plan.

Service providers should leverage the strong presence of recovery support groups in the Western Cape (e.g. AA, NA, Overeaters Anonymous, Sex and Love Addicts Anonymous, and Gamblers Anonymous) as part of the recovery process, given that aftercare services are limited in South Africa (Mpanza et al., 2021; Isobell, Kamaloodien & Savahl, 2018). For those who may follow a peer-assisted recovery pathway, linkages with other mutual aid groups are critical. That is, members should be encouraged to self-monitor and seek out other support groups or professional help when in need of recovery support for substitute addictions.

7.8.3. Implications for management of substitute addictions

Service users and service providers should collaboratively set the goals for recovery (e.g. abstinence, harm reduction towards abstinence or moderation management) bearing in mind that recovery is a long term and ongoing process. Critical questions within this dialogic exchange are: How is relapse defined? How is recovery defined? Practically, service users should be equipped to personally monitor their behaviour and identify patterns and motives. The capacity to self-reflect to identify whether substitute behaviours are supporting or threatening recovery within the recovery parameters they have established for themselves is essential. As we have shown, subjective evaluations of substitute behaviours differ and play an important role in their identification (Chapter 6). Thus, self-assessments are needed to become aware of potential substitutes.

Given its association with abstinence, relapse and substitution in this dissertation (Chapter 4), service providers would benefit from including recovery capital in conceptual models and recovery-supportive interventions. Recovery capital can be regarded as resources at individual, interindividual and community levels (Best & Hennessy, 2021), and can thus inform treatment goals.

As concurrent addictions were a commonly identified mechanism for substitution (Chapters 5 and 6), a transdiagnostic approach to treatment may be used to target

mechanisms common to both substance and behavioural addictions (Kim & Hodgins, 2018). The nature of substitutes and dynamics and interactions between behaviours should be established once a set of addictions are identified (Carnes et al., 2005). By expanding service users' repertoire of coping skills, for example, the functions of the primary addictive behaviours should not need to be motives for substitution. Instead, more adaptive behaviours may be adopted.

7.8.4. Implications for policy

At a policy level, interventions to promote recovery and address substitute addictions should prioritise the implementation of aftercare services and the establishment of recovery capital. Integrated aftercare services are part of the continuum of care and improve treatment outcomes (Meyer, 2005). In the South African context, aftercare and reintegration services are provided within publicly- and privately-funded inpatient and outpatient treatment settings; community-based programmes; hospitals; clinics but may also involve 12-step self-help groups, home visits, as well as individual and family interventions. While the evolution "from having no aftercare content to a minimal allowance for aftercare in policies" is to be acknowledged and is a step in the right direction, more can be done (Mpanza et al., 2021, p. 138). Furthermore, to date, policies have not carefully attended to the content of aftercare and reintegration interventions. Based on the findings of this dissertation, a key content focus should also be substitute addictions. Aftercare services should be planned for within the early stages of treatment and linkages should be facilitated upon discharge (Mpanza et al., 2021). However, in research and practice, aftercare and reintegration services have not been accorded sufficient attention (Mahlangu & Geyer, 2018; Swanepoel et al., 2016; Van der Westhuizen, 2015; Van der Westhuizen et al., 2013).

Based on the results of the study, an enhanced policy focus on harm reduction in South Africa is also recommended. There have been calls for policy shifts towards more acceptance of harm reduction approaches (Magidson et al., 2019) and criticisms for "only paying lip service to the provision" of such programmes (Scheibe et al., 2017, p. 197). The country's first multi-city harm reduction service provision project, employing a participatory

approach, has alongside other outcomes promoted "a renewed sense of personhood and right to exist in the world", as participants have reported (Versfeld et al., 2018, p. 329). Peer-led participatory approaches have also been applied to the co-creation of aftercare programmes, and, while not without challenges, help to build local recovery capital. Beneficiaries derive maximal benefits and programmes leverage existing resources (Tober et al., 2013). Such examples make a compelling case for centrally involving persons who use substances in policy and intervention responses (Kriegler, 2020). The urgent need to empirically-ground policy formulation makes a cogent case for the uptake of the findings of this dissertation (Groenewald & Bhana, 2018; Pienaar & Savic, 2016; Mpanza et al., 2021).

7.8.5. Recommendations for addiction research

A research agenda that is predicated on this study should further investigate potential mediators and moderators of substitution using a life-course approach, that is studies that longitudinally explore distal and proximal factors (Evans-Polce, Doherty & Ensminger, 2014). Longer-term follow-ups should also be undertaken with service users to further elucidate the course and dynamics of substitute behaviours (Chapter 4). Building upon the analyses we offer in Chapter 4, future longitudinal research should also consider the individual contributions of variables, reciprocal or bidirectional influences and any interaction effects on substitute addictions. A related research priority is to explore substitute addictions among persons in stable and sustained recovery affiliated with recovery support groups such as AA, Sex and Love Addicts Anonymous, and Gamblers Anonymous.

While we have taken important steps to conceptually clarify substitute addictions, it would be premature to expect a final consensus among researchers on standardized definition(s). However, to systematize and replicate research, a future research agenda is the continued development and refinement of the concept and we urge others, as we have done, to specify their operational definitions and assumptions. Considering that (1) recovery goals may differ and (2) that the scope (range of domains in which changes occur) and depth (extent of change within domains) of recovery also differ (White & Kurtz, 2006), another area

requiring more research involves considering how recovery goals such as moderation management or harm reduction intersect with substitution and substitute behaviours.

While this project has addressed the need to explore substitute addictions amongst recovery support group attendees and among recipients of substance use treatment, the need for future studies in the context of natural recovery (Cloud & Granfield, 2001) remains in South Africa, in other LMIC settings as well as globally (Chapter 2). Furthermore, homeless persons and otherwise disadvantaged populations are underrepresented in public and private treatment services. Homelessness is likely to prohibit engagement in a range of behavioural addictions (e.g. smartphone, shopping, work and exercise addiction; S. Sussman, personal communication, December 22, 2021). That is not to say that homeless persons do not engage in behavioural addictions.

Finally, and considering the complexities of South African society, continued work on substitute addictions should seek to recruit participants across race and class divides in the Western Cape and other provinces. In the case of service providers, a range of practitioner types, treatment settings and philosophies should also be included in future research. Additionally, as the private and public sectors represent two distinct systems of care (Naidoo, 2012), it would be important to explore whether substitutes, associated factors and perceptions of substitution differ between these services.

7.9. Conclusion

This study makes an important contribution to our understanding of relapse and recovery in general and substitute addictions in particular. Substitute addictions have been on the periphery for some time and are under-researched globally and particularly from the context of LMICs. A call is put forward for addiction service providers, researchers and all other relevant stakeholders to build upon this work. After all, substitute behaviours develop along diverse trajectories and are a clinically pertinent and critically important consideration throughout recovery.

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Appendix 1: Baseline questionnaire

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The purpose of this survey is to better understand substance and behavioural expressions of 'addiction'.
Your answers will remain confidential and will be used to inform treatment and recovery support services.

Age _____	**Date of admission to treatment** (dd/mm/yyyy) _____/_____/_____	**Cell number** _____
Gender Male ☐ Female ☐ Other ☐	**Relationship status** Single ☐ In a committed relationship ☐ Married ☐ Cohabiting ☐ Divorced/Separated/Widowed ☐	**Contact person 1** Name: _____ Cell number: _____ Relationship: _____
Race (how do you classify yourself?) Black African ☐ Coloured ☐ Indian/Asian ☐ White ☐	Did you live with a substance using partner before treatment? **Yes** ☐ **No** ☐	**Contact person 2** Name: _____ Cell number: _____ Relationship: _____
Primary substance of use _____	**Highest level of education** Primary school ☐ Secondary school ☐ Post-secondary school ☐	**Suburb of residence** _____
Which other substances did you use? _____	**Employment status** Employed ☐ Unemployed ☐ Possibility of employment ☐	**ID:**

Below is a list of sentences about resources that can be used to initiate and sustain recovery. Please read each sentence in the list carefully. Indicate your level of agreement with each statement by placing an X in the corresponding space in the column next to each statement.

	Not at all agree	Agree a little	Agree somewhat	Agree a lot	Agree completely
1. There are more important things to me in life than using substances					
2. In general, I am happy with my life					
3. I have enough energy to complete the tasks I set myself					
4. I am proud of the community I live in and feel part of it					
5. I get lots of support from friends					
6. I regard my life as challenging and fulfilling without the need for using drugs or alcohol					
7. My living space has helped to drive my recovery journey					
8. I take full responsibility for my actions					
9. I am happy dealing with a range of professional people					
10. I am making good progress on my recovery journey					

Flourishing
Below are 8 statements with which you may agree or disagree. Using the scale below, indicate your level of agreement or disagreement with each statement.

	1 = Not at all agree									10 = Strongly agree
▪ I lead a purposeful and meaningful life.	1	2	3	4	5	6	7	8	9	10
▪ My relationships with my friends and family are supportive and rewarding.	1	2	3	4	5	6	7	8	9	10
▪ I am involved and interested in my daily activities.	1	2	3	4	5	6	7	8	9	10
▪ I actively contribute to the happiness and well-being of others.	1	2	3	4	5	6	7	8	9	10
▪ I am capable to do the activities that are important to me.	1	2	3	4	5	6	7	8	9	10
▪ I am a good person and live a good life.	1	2	3	4	5	6	7	8	9	10
▪ I feel positive about my future.	1	2	3	4	5	6	7	8	9	10
▪ People respect me.	1	2	3	4	5	6	7	8	9	10

Sometimes people have an 'addiction' to a certain drug or other object or activity. An addiction occurs when people: (1) Do something over and over again to try to feel good, for excitement, or to stop feeling bad; (2) Can't stop doing this thing, even if they wanted to (powerlessness). Did you use/do the following things before treatment? Were you 'addicted' to it before treatment? For how long were you 'addicted'?

	I used/did it before treatment					I was 'addicted' to it before treatment					For how long?	
Object or activity	Never	Seldom	Sometimes	Often	Very often	Not at all agree	Agree a little	Agree somewhat	Agree a lot	Agree completely	Years	Months
1. Cigarettes												
2. Vaping (E-cigarettes)												
3. Alcohol (e.g. beer, wine, and/or hard liquor)												
4. Cannabis (Dagga)												
5. Methaqualone (Mandrax)												
6. Heroin												
7. Nyaope/ Whoonga												
8. Crystal Methamphetamine (Tik)												
9. Ecstasy												
10. Cocaine												
11. LSD												
12. Methcathinone (CAT)												
13. Prescription medication												
14. Over-the-counter medication												
15. Caffeine (e.g. coffee, or energy drinks such as Red Bull)												
16. Eating (way too much food each day and/or high-sugar foods such as chocolates; binging; purging; food restriction)												
17. Gambling (e.g. slot machines, casino games, lotteries, scratch cards, betting, online)												
18. Internet browsing (surfing the web)												
19. Social networking (e.g. Facebook, Twitter, Instagram, WhatsApp)												
20. Self-harm (cutting, skin picking, hair pulling)												
21. Binge-watching (e.g. TV series, movies, documentaries)												
22. Online or offline videogames (e.g. PlayStation, Xbox, Wii)												
23. Shopping (in stores; online)												
24. Love (e.g. thoughts, feelings, behaviours about love and relationships)												
25. Sex (e.g. sexual activity, pornography use, voyeurism, online)												
26. Exercise (e.g. sports/extreme sports)												
27. Work												
28. Stealing (kleptomania)												
29. Religion (activities/practices)												
30. Any other addiction? Please specify: _____												

Positive and Negative Feelings

Please think about what you have been doing and experiencing during the past 4 weeks. Then report how much you experienced each of the following feelings, using the scale below. For each question please tick the option that best suits you.

	0 = Very rarely or never	1= Rarely	2 = Sometimes	3 = Often	4 = Very often or always
▪ Positive	0	1	2	3	4
▪ Negative	0	1	2	3	4
▪ Good	0	1	2	3	4
▪ Bad	0	1	2	3	4
▪ Pleasant	0	1	2	3	4
▪ Unpleasant	0	1	2	3	4
▪ Happy	0	1	2	3	4
▪ Sad	0	1	2	3	4
▪ Afraid	0	1	2	3	4
▪ Joyful	0	1	2	3	4
▪ Angry	0	1	2	3	4
▪ Satisfied	0	1	2	3	4

Overall, how satisfied are you with your life as a whole?

0 = Not at all Satisfied										10 = Completely satisfied
0	1	2	3	4	5	6	7	8	9	10

Appendix 2: Follow-up questionnaire

UNIVERSITY of the WESTERN CAPE

The purpose of this survey is to better understand substance and behavioural expressions of 'addiction'. Your answers will remain confidential and will be used to inform treatment and recovery support services.

Questionnaire ID: _____

GHENT UNIVERSITY

Date of birth (dd/mm/yyyy) _____/_____/_____ **Suburb of residence** _____	**Did you complete treatment?** Yes ☐ No ☐ **For how long were you in treatment?** _____ weeks **Date of discharge from treatment** (dd/mm/yyyy) _____/_____/_____
Employment status Employed ☐ Unemployed ☐ Possibility of employment ☐ Retired ☐ Student ☐ Other ☐ **Please specify:** _____ **What is the highest level of education that you completed?** _____	**How old were you when you first entered (outpatient/inpatient) treatment?** _____ years old **How many times have you been in (in- and out-patient) treatment?** _____ (outpatient) _____ (inpatient) **Since leaving treatment have you used your primary substance(s) of choice?** Yes ☐ No ☐
Relationship status Single ☐ In a committed relationship ☐ Married ☐ Cohabiting ☐ Divorced/Separated/Widowed ☐ **Do you currently live with a substance using partner?** Yes ☐ No ☐ **Do you currently live with anyone else that uses substances?** Yes ☐ No ☐ If so, what is your relationship with them? _____	**Since leaving treatment have you used any other substances?** (including cigarettes and alcohol) Yes ☐ No ☐ **Please specify:** _____ **Are you accessing any aftercare services?** Yes ☐ No ☐ **Please specify:** _____ **How often do you attend aftercare services?** Daily ☐ Weekly ☐ Monthly ☐ Other ☐ Please specify: _____
When you started treatment were you living with anyone else that was using substances? Yes ☐ No ☐ If so, what is your relationship with them? _____	**Do you have any chronic health conditions?** (e.g. depression, anxiety, hypertension, diabetes, HIV/ AIDS) Yes ☐ No ☐ **Please specify:** _____

Below is a list of sentences about resources that can be used to initiate and sustain recovery. Please read each sentence in the list carefully. Indicate your level of agreement with each statement by placing an X in the corresponding space in the column next to each statement.

	Not at all agree	Agree a little	Agree somewhat	Agree a lot	Agree completely
1. There are more important things to me in life than using substances					
2. In general, I am happy with my life					
3. I have enough energy to complete the tasks I set myself					
4. I am proud of the community I live in and feel part of it					
5. I get lots of support from friends					
6. I regard my life as challenging and fulfilling without the need for using drugs or alcohol					
7. My living space has helped to drive my recovery journey					
8. I take full responsibility for my actions					
9. I am happy dealing with a range of professional people					
10. I am making good progress on my recovery journey					

Flourishing

Below are 8 statements with which you may agree or disagree. Using the scale below, indicate your level of agreement or disagreement with each statement.

	1 = Not at all agree									10 = Strongly agree
▪ I lead a purposeful and meaningful life.	1	2	3	4	5	6	7	8	9	10
▪ My relationships with my friends and family are supportive and rewarding.	1	2	3	4	5	6	7	8	9	10
▪ I am involved and interested in my daily activities.	1	2	3	4	5	6	7	8	9	10
▪ I actively contribute to the happiness and well-being of others.	1	2	3	4	5	6	7	8	9	10
▪ I am capable to do the activities that are important to me.	1	2	3	4	5	6	7	8	9	10
▪ I am a good person and live a good life.	1	2	3	4	5	6	7	8	9	10
▪ I feel positive about my future.	1	2	3	4	5	6	7	8	9	10
▪ People respect me.	1	2	3	4	5	6	7	8	9	10

Sometimes people have an 'addiction' to a certain drug or other object or activity. An addiction occurs when people: (1) Do something over and over again to try to feel good, for excitement, or to stop feeling bad; (2) Can't stop doing this thing, even if they wanted to (powerlessness/loss of control). Did you use/do the following things since leaving treatment? Are you 'addicted' to it now/the last 30 days? For how long have you used/done it since leaving treatment?

	I used/did it after treatment					I am 'addicted' to it now/the last 30 days					How long, used/done post-treatment?
Object or activity	Never	Seldom	Sometimes	Often	Very often	Not at all agree	Agree a little	Agree somewhat	Agree a lot	Agree completely	Days
1. Cigarettes											
2. Vaping (E-cigarettes)											
3. Alcohol (e.g. beer, wine, and/or hard liquor)											
4. Cannabis (Dagga)											
5. Methaqualone (Mandrax)											
6. Heroin											
7. Nyaope/ Whoonga											
8. Crystal Methamphetamine (Tik)											
9. Ecstasy											
10. Cocaine											
11. LSD											
12. Methcathinone (CAT)											
13. Prescription medication											
14. Over-the-counter medication											
15. Caffeine (e.g. coffee, or energy drinks such as Red Bull)											
16. Eating (way too much food each day and/or high-sugar foods such as chocolates; binging; purging; food restriction)											
17. Gambling (e.g. slot machines, casino games, lotteries, scratch cards, betting, online)											
18. Internet browsing (surfing the web)											
19. Social networking (e.g. Facebook, Twitter, Instagram, WhatsApp)											
20. Self-harm (cutting, skin picking, hair pulling)											
21. Binge-watching (e.g. TV series, movies, documentaries)											
22. Online or offline videogames (e.g. PlayStation, Xbox, Wii)											
23. Shopping (in stores; online)											
24. Love (e.g. thoughts, feelings, behaviours about love and relationships)											
25. Sex (e.g. sexual activity, pornography use, voyeurism, online)											
26. Exercise (e.g. sports/extreme sports)											
27. Work											
28. Stealing (kleptomania)											
29. Religion (activities/practices)											
30. Any other addiction? Please specify: _____											

Why do you think you've increased the use of other substances since leaving treatment?_____

_____

Why do you think there's been an increase in certain types of your behaviours since leaving treatment? _____

_____

Positive and Negative Feelings

Please think about what you have been doing and experiencing during the past 4 weeks. Then report how much you experienced each of the following feelings, using the scale below. For each question please tick the option that best suits you.

	0 = Very rarely or never	1= Rarely	2 = Sometimes	3 = Often	4 = Very often or always
▪ Positive	0	1	2	3	4
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▪ Joyful	0	1	2	3	4
▪ Angry	0	1	2	3	4
▪ Satisfied	0	1	2	3	4

Overall, how satisfied are you with your life as a whole?

0 = Not at all Satisfied										10 = Completely satisfied
0	1	2	3	4	5	6	7	8	9	10

Appendix 3: Focus Group Interview Schedule

Because you are service providers in the substance use treatment system, you have been invited to participate in this focus group discussion on substitute addictions. Throughout the discussion today, I encourage you to express your points of view and experiences freely. Please could each of you briefly tell me what your title is here at the treatment facility, and for how long you've fulfilled this role?

Understandings of substitute addiction

I'd like to start our discussion by speaking about addiction more generally.

1. What is an addiction?
2. What could one become 'addicted' to? Please elaborate.
3. Do all behaviours have the potential to be addictions? Please elaborate.
4. What do you understand by the term 'substitute addiction'?
5. In which ways do substitute addictions manifest? Please elaborate.
   - Do you think drug addictions always come first?
   - Do you think some addictions have been concurrent with the drug addiction that become noticeable after the person stops their drug use?
6. What are the implications of substitute addictions for recovery?
   - Do substitute addictions promote or challenge recovery? How?

Experiences of delivering treatment

7. Have service users you've treated ever developed substitute addictions? Please elaborate.
   - How frequently does this occur?
   - How do you detect the substitute addiction?
8. What do you do once the substitute addiction is revealed?
   - Does your programme have any component to sensitize service users about substitute addictions? Please elaborate.

Recommendations for treatment services

9. Do you have any recommendations for prevention of substitute addictions?
10. Do you have any recommendations for detection of substitute addictions?
11. Do you have any recommendations for management of substitute addictions?

Appendix 4: In-depth Interview Schedule

Thank you for your time today. In this interview, I'd like to talk to you about your recovery experience and experiences pre-recovery.

1. Could you tell me a bit about yourself?
    a. How old are you?
    b. Are you employed? If retired, what was your profession previously?
    c. Are you married or in a relationship?
    d. Are you a parent?
    e. What would you like for me to know about you before we start this interview?
    f. Which substances have you used?
2. What does recovery mean to you?

Brief history of substance use and treatment

For some individuals, recovery starts with a formal treatment programme.

3. Have you ever been treated for substance use?
4. For which substance/s were you treated?
    a. For how long were you using _____?
    b. For how long were you in treatment? (Repeat for each treatment episode)
    c. Did you complete the treatment programme?
        - (If yes): What enabled you to complete treatment?
        - (If no): What do you think prevented you from completing the treatment programme?
5. How do you think you've managed to stay clean?
6. Is there any behaviour that helps you stay off ___?
7. Do you have any relapse prevention plan in place for yourself? Please tell me more about that.
8. Do you have an aftercare plan in place for yourself? Please tell me more about that.

If the support group is mentioned/Interviewee states: You belong to a recovery support group:

9. What do you gain from belonging to the recovery support group?
10. What role does the support group play in your life?
11. What does your involvement in the support group involve?
12. Are there any positive aspects of belonging to a support group?
13. Are there any negative aspects of belonging to a support group?

Recovery and Substitute addiction

14. How would you describe your life in recovery from _____? (e.g. self, relationships)
15. Since you've been in recovery, have you made any lifestyle changes?

a. What have those changes been?

16. Since you first pursued recovery, have you noticed yourself doing any behaviours or activities over and over again/ or more of/ that you didn't do before?
17. Are these behaviours that you're happy or unhappy with?

Probe around use of *substances:* Alcohol; Nicotine/cigarettes; CAT; Cocaine/crack; Cannabis; Cannabis/Mandrax; Ecstasy; Heroin; Inhalants; Methamphetamine; Nyaope/Whoonga; Over-the-counter and prescription medicines?

Probe around the following *behaviours:* Exercise; Shopping; Sex; Eating; Work; Love/ relationships; Religious activities; Use of internet and video games; Social networking (e.g. Facebook) and/or Gambling? Please tell me more about that.

If the interviewee responds yes to questions 13 or 14, ask:

18. Please could you tell me more about how you started using _____/ or engaging in _____/used more of/ engaged in _____ more than before?
19. What made you gravitate toward this behaviour?
    a. How accessible was the substance or behaviour to you?
    b. What made the behaviour appealing to you?
    c. Was there any specific language you needed to be familiar with to access the substance/ behaviour?
    d. Who did you need to communicate with to access ___ or perform the behaviour_____?
    e. Did you experience any feelings of belonging with activities and groups related to the behaviour?
    f. What were your expectations of _____? How well did the behaviour meet your expectations?
20. Have you experienced any advantages or disadvantages due to your increase in _____?
21. Do you think that you've substituted your addiction to _____?
22. What are your thoughts on substitution?

If interviewee hasn't had personal experience of substitute addiction, ask:

23. Does stopping one addiction place someone at risk of developing a new addiction? Please elaborate.
24. Is it always harmful to replace one substance with another/ engage in a new behaviour excessively? Please elaborate.

Appendix 5: Data Storage Fact Sheets

Name/identifier study: Recovery and substitute addictions in the Western Cape, South Africa: A multi-perspective approach
Author: Deborah Louise Sinclair
Date: 01/ 01/ 2021

1. Contact details

1a. Main researcher

- name: Deborah Louise Sinclair
- address: Ghent University, Department of Special Needs Education
- e-mail: deborahlouise.sinclair@ugent.be

1b. Responsible Staff Member (ZAP)

- name: Wouter Vanderplasschen
- address: Ghent University, Department of Special Needs Education
- e-mail: wouter.vanderplasschen@ugent.be

If a response is not received when using the above contact details, please send an email to data.pp@ugent.be or contact Data Management, Faculty of Psychology and Educational Sciences, Henri Dunantlaan 2, 9000 Ghent, Belgium.

2. Information about the datasets to which this sheet applies

* Reference of the publication in which the datasets are reported: Sinclair, D. L., Sussman, S., De Schryver, M., Samyn, C., Adams, S., Florence, M., ... & Vanderplasschen, W. (2021). Substitute behaviors following residential substance use treatment in the Western Cape, South Africa. *International Journal of Environmental Research and Public Health, 18*(23), 12815. https://doi.org/10.3390/ijerph182312815

* Which datasets in that publication does this sheet apply to?:

All of the data used in the corresponding article and chapter.

3. Information about the files that have been stored

3a. Raw data

* Have the raw data been stored by the main researcher? [X] YES / [ ] NO
If NO, please justify:

* On which platform are the raw data stored?
  - [X] researcher PC
  - [ ] research group file server
  - [X] other (specify): Also stored on a UGent-share managed by DICT

* Who has direct access to the raw data (i.e., without intervention of another person)?
  - [X] main researcher
  - [X] responsible ZAP
  - [ ] all members of the research group
  - [ ] all members of UGent
  - [ ] other (specify): ...

3b. Other files
---

* Which other files have been stored?
  - [ ] file(s) describing the transition from raw data to reported results. Specify: ...
  - [X] file(s) containing processed data. Specify: The captured dataset
  - [X] file(s) containing analyses. Specify: Statistical analysis output
  - [X] files(s) containing information about informed consent
  - [X] a file specifying legal and ethical provisions
  - [ ] file(s) that describe the content of the stored files and how this content should be interpreted. Specify: ...
  - [ ] other files. Specify: ...

* On which platform are these other files stored?
  - [X] individual PC
  - [ ] research group file server
  - [X] other: The electronic dataset, files containing analysis and notes are also stored on a UGent-share managed by DICT and hard copy questionnaires and notes are held in a locked cupboard in the office of the main researcher and supervisor (responsible ZAP) at the Department of Special Needs Education (located at Dunantlaan 1, 9000 Ghent).

* Who has direct access to these other files (i.e., without intervention of another person)?
  - [X] main researcher
  - [X] responsible ZAP
  - [ ] all members of the research group
  - [ ] all members of UGent
  - [ ] other (specify): ...

4. Reproduction
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* Have the results been reproduced independently?: [ ] YES / [X] NO

* If yes, by whom (add if multiple):
   - name:
   - address:
   - affiliation:
   - e-mail:

Data Storage Fact Sheet

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Author: Deborah Louise Sinclair
Date: 01/ 01/ 2021

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* Which datasets in that publication does this sheet apply to?:
All of the data that was used in the corresponding article and chapter.

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3a. Raw data

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If NO, please justify:

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  - [ ] all members of the research group
  - [ ] all members of UGent
  - [ ] other (specify): ...

3b. Other files
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* Which other files have been stored?
  - [] file(s) describing the transition from raw data to reported results. Specify: ...
  - [X] file(s) containing processed data. Specify: Verbatim transcriptions
  - [X] file(s) containing analyses. Specify: Coding notes
  - [X] files(s) containing information about informed consent
  - [X] a file specifying legal and ethical provisions
  - [ ] file(s) that describe the content of the stored files and how this content should be interpreted. Specify: ...
  - [ ] other files. Specify: ...

* On which platform are these other files stored?
  - [X] individual PC
  - [ ] research group file server
  - [X] other: The transcribed interview and analysis notes are stored on a UGent-share managed by DICT and on hard copy in a locked cupboard at the office of the main researcher and supervisor (responsible ZAP) at the Department of Special Needs Education (located at Henri Dunantlaan 1, 9000 Ghent).
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Author: Deborah Louise Sinclair
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2. Information about the datasets to which this sheet applies
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* Reference of the publication in which the datasets are reported:
Sinclair, D. L., Sussman, S., Vantomme, L., Savahl, S., Florence, M & Vanderplasschen, W. Service providers' perceptions of substitute addictions in the Western Cape, South Africa.

* Which datasets in that publication does this sheet apply to?:
All of the data that was used in the corresponding article and chapter.

3. Information about the files that have been stored
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3a. Raw data
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* Have the raw data been stored by the main researcher? [X] YES / [ ] NO
If NO, please justify:

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  - [X] other (specify): Also stored on a UGent-share managed by DICT

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  - [X] main researcher

  - [X] responsible ZAP
  - [ ] all members of the research group
  - [ ] all members of UGent
  - [ ] other (specify): ...

3b. Other files
---

* Which other files have been stored?
  - [] file(s) describing the transition from raw data to reported results. Specify: ...
  - [X] file(s) containing processed data. Specify: Verbatim transcriptions
  - [X] file(s) containing analyses. Specify: Coding notes
  - [X] files(s) containing information about informed consent
  - [X] a file specifying legal and ethical provisions
  - [ ] file(s) that describe the content of the stored files and how this content should be interpreted. Specify: ...
  - [ ] other files. Specify: ...

* On which platform are these other files stored?
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  - [ ] research group file server
  - [X] other: The transcribed focus group discussions (n=5) and analysis notes are stored on a UGent-share managed by DICT and on hard copy in a locked cupboard at the office of the main researcher and supervisor (responsible ZAP) at the Department of Special Needs Education (located at Henri Dunantlaan 1, 9000 Ghent).
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Author: Deborah Louise Sinclair
Date: 01/ 01/ 2021

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2. Information about the datasets to which this sheet applies
==========
* Reference of the publication in which the datasets are reported:
Sinclair, D. L., Sussman, S., Savahl, S., Florence, M & Vanderplasschen, W. Narcotics Anonymous attendees' perceptions and experiences of substitute behaviours in the Western Cape, South Africa.

* Which datasets in that publication does this sheet apply to?:
All of the data that was used in the corresponding article and chapter.

3. Information about the files that have been stored
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3a. Raw data
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Appendix 6: List of Publications

Article 1

Sinclair, D. L., Sussman, S., Savahl, S., Florence, M., Adams, S., & Vanderplasschen, W. (2021). Substitute addictions in persons with substance use disorders: A scoping review. *Substance Use & Misuse, 56*(5), 683-696. https://doi.org/10.1080/10826084.2021.1892136

Article 2

Sinclair, D. L., Vanderplasschen, W., Savahl, S., Florence, M., Best, D., & Sussman, S. (2021). Substitute addictions in the context of the COVID-19 pandemic. *Journal of Behavioral Addictions, 9*(4), 1098-1102. https://doi.org/10.1556/2006.2020.00091

Article 3

Sinclair, D. L., Sussman, S., De Schryver, M., Samyn, C., Adams, S., Florence, M., Savahl, S & Vanderplasschen, W. (2021). Substitute behaviors following residential substance use treatment in the Western Cape, South Africa. *International Journal of Environmental Research and Public Health, 18*(23),12815. https://doi.org/10.3390/ijerph182312815