

Table 7 shows that 67.3% of participants of Leeu Gamka who were aware of the fluorosis stains, admitted to being teased because of the appearance of their teeth compared to a small percentage in the other areas. De Castilho *et al* (2009) found that there were conflicts between students at a Brazilian school between the affected and non-affected due to teasing and stigmatizing. Coffield *et al* (2005) found a large percentage (93%) of children who admitted to being teased about the appearance of their teeth due to enamel defects. It was found that of the participants who were aware of fluorosis affliction only a small portion actually sought treatment for the removal of the fluorosis stains across the geographic areas. At Leeu Gamka only 10.2 % of the participants sought treatment where the more severe type of fluorosis are more common. The reasons for this might be the distance from the dental service situated at Beaufort West (70km from Leeu Gamka, 50 km from Nelspoort and 165 km from Murraysburg and Merweville) or the children might have adapted to the appearance of fluorosis and consider it to be “normal” because it is such a common finding in their area. Van Palenstein and Mkasabuni (1993) found that even though most of the participants wanted treatment, none of them actually sought dental treatment with reasons being that the aesthetic disorder was not painful and that cosmetic dentistry was not available or affordable. The Central Karoo is also a rural area and these reasons can be applicable to the area as well.

The actions taken by the parents and children varied from going to the dentist (for dental extractions), brushing with domestic bleaching agents (Jik), brushing with abrasives for example ash or wood in an attempt to enhance the appearance of the teeth. This is in agreement with previous research (van Palenstein and Mkasabuni, 1993; Lewis and Chikte, 1995; Yoder *et al*, 1998; Mothusi, 2000).

5.5 Perceptions of Fluorosis (Clinically Defined Fluorosis)

It is notable that in all the geographic areas the response to the photographs depicting no and mild fluorosis revealed that the learners did not find such teeth aesthetically pleasing (Table 9). The average response score varied between 4.03-4.75 for the photographs depicting normal and mild fluorosis across all the geographic areas which reflected a greater tendency to “disagree” to “strongly disagree” with the statement.

The participants were concerned with the “yellow” appearance of the photographs depicting normal teeth and mild fluorosis. The media could be a determinant in this finding because the teeth shown by the media are normally unnaturally white in appearance and this is perceived by the community to be healthy and the norm. Children of a certain age are critical of their own appearance and the appearance of others and they are usually in their adolescent years (Wondwossen *et al*, 2003a) and the greater proportion of the study sample was adolescents.

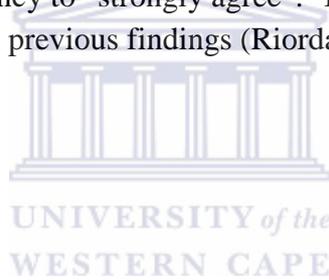
Browne *et al* (2011) and McGrady *et al* (2012) found that uniform white teeth, where the degree of whiteness could only be attained by bleaching, had the highest preference by adolescents. The learners across the geographic areas had dissatisfaction with the appearance of photographs depicting no fluorosis. This finding was consistent with findings of Clarkson and O ‘Mullane (1992) and Riordan (1993). These authors attributed this to the possibility that the observers became confused or distracted by other attributes of the face and mouth of the children considered. This “dissatisfaction” had an effect consistently throughout the clinically defined fluorosis response in this study. Another reason could be the quality of the images shown to the learners because the images were photos from a book.

There was a strong tendency across the geographic areas to “disagree” to “strongly disagree” for “moderate” fluorosis. There was also a strong tendency across the geographic areas to “strongly disagree” on this statement (Table 9) for the photograph showing severe dental fluorosis. This is in agreement with previous research that with an increase in fluorosis severity there is a decline in acceptance and the participants consider fluorosis to be aesthetically objectionable (Riordan, 1993; Clark *et al*, 1993; Wondwossen *et al*, 2003a; Wondwossen *et al*, 2003b; McGrady *et al*, 2012; Browne *et al*, 2011)

The finding in Table 10 that no fluorosis and mild fluorosis was considered to be an embarrassment by the learners across the geographic areas (low- and high fluoride areas) can be due to reasons stated earlier i.e.: adolescents prefer uniform white teeth, the learners became confused or distracted by other attributes of the face and mouth of the children considered and the possibility of the quality of the images shown to the participants. The finding of no fluorosis and mild fluorosis being a source of embarrassment for the participants across the geographic areas differs from the findings of Wondwossen *et al* (2003a). According to Wondwossen *et al* (2003a) learners from a high fluoride area (Nazreth) were less critical of mild fluorosis as a source of embarrassment because they themselves were afflicted and therefore have a higher threshold of tolerance to the cosmetic effects of dental fluorosis, contrary to the learners from the low fluoride area (Addis Ababa) where the learners were more critical of mild fluorosis and perceived it to be a source of embarrassment. Learners perceived severe and moderate fluorosis to be an embarrassment to the individual. The increase of fluorosis severity might lead to a decline in preference by the learners and the photographs depicting moderate and severe fluorosis were perceived less favourable (Riordian, 1993 ; Wondwossen *et al*, 2003a ; Wondwossen *et al*, 2003b; McGrady *et al*, 2012; Browne *et al*, 2011; Aguilar-Diaz *et al*, 2011).

The responses to the statement on neglect (Table 11) illustrates that across the geographic areas learners selected “agree” to “strongly agree” for all the photographs. Learners erroneously believed that the appearance of the teeth was due to neglect on the part of the child. This is in agreement with the findings of Wondwossen *et al* (2003a) and Wondwossen *et al* (2003b). Riordan (1993) also found that participants indicated that more severe dental fluorosis was due to neglect on the part of the child. Wondwossen *et al* (2003b) found that more than 50 % of participants of the low fluoride area (Addis Ababa) “agree” and “strongly agree” that teeth depicting TF (Thylstrup Fejerskov) scores of 5 and 7 was due to neglect on the part of the child.

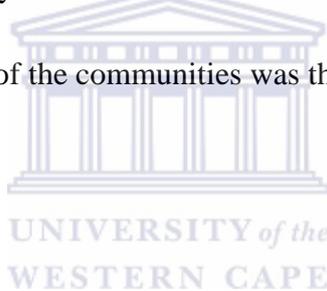
The responses to the statement on disadvantage (Table 12) illustrated that learners across the geographic areas showed a strong tendency towards “agree” and “strongly agree” for all the photographs. Learners believed that the appearance of the teeth will be a disadvantage as the child goes into adult life even for the photograph depicting no fluorosis. Severe fluorosis was met with a unanimous negativity by all the learners across the geographic areas and the learners showed a strong tendency to “strongly agree”. The findings for severe fluorosis are in agreement with previous findings (Riordan, 1993; Wondwossen *et al*, 2003 b).



Chapter 6

Conclusions

- There exists a positive relationship between dental fluorosis and fluoride concentration of the drinking water- fluorosis severity and affliction increased with an increase of fluoride concentration in the drinking water.
- Fluorosis was only a problem in Leeu Gamka (high fluoride area) and not the three other areas (low fluoride areas).
- Most of the learners were not aware of fluorosis affliction, which was a common finding in the three low fluoride areas.
- Only a small proportion of learners that indicated that they wanted treatment actually sought dental treatment.
- Across the geographic areas learners admitted to being teased due to dental fluorosis affliction.
- There was a consistent tendency across all the geographic areas that dental fluorosis will be an embarrassment for the child and that it will be a disadvantage for the child into adulthood.
- The learners erroneously believed that dental fluorosis was due to neglect on the part of the child.
- The general consensus of the communities was that fluorosis was judged with feelings of negativity.



Chapter 7

Recommendations

The fluoride content of the drinking water in Leeu Gamka (1.62ppmF) is higher than the WHO (1997) recommended optimum value of 0.7-1.2 mg/l depending on climate, diet and use of fluoride supplements. This is an unacceptable level of fluoride concentration of the drinking water and results in dental fluorosis in the area. Chikte *et al* (2001) reported that a proposed fluoride concentration of not more than 0.7 ppmF prescribed in the Regulations on Fluoridating the Water Supplies for South Africa would minimise the risk of dental fluorosis.

It is recommended that the use of rainwater harvesting for consumption and to use clay pots to store the drinking water in (helps to reduce the fluoride content of the drinking water by absorption of the fluoride of the clay minerals) (Wilkister *et al.* 2001). The consumption of rain water might be better but the Central Karoo is a water scarce area. Another option that can be explored is to find an alternative water source.

The people should also be educated on the etiology of dental fluorosis, the pathology and the importance of safe drinking water. De-fluoridation of the drinking water might prove to be too costly for the local government to maintain. Cheaper methods of treating the water source with raw bricks, rain water harvesting and storing the drinking water in clay pots might be more realistic approaches.

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