Prisoner and lay opinions of a prison-issue oral health kit

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Abstract

Research in prison populations has revealed poor oral health. In some cases prisoners have attributed their poor oral hygiene to the prison issue oral health kit of toothbrush and toothpaste.

Aim: To describe the views of a prisoner population and a non-prison or lay population on the prison-issue oral health kit.

Method: Prisoners’ views on the prison issue oral health kit from a previous study by the same researchers were compared with those of a group of lay people. The sample size of lay people (48) was determined by the number of oral health kits made available by HMP Brixton. Lay participants were provided with an oral health kit containing one standard, prison issue toothbrush and a 50ml tube of toothpaste (1,000ppm F). They were invited to use them twice daily for a period of one week. A simple, eight-item questionnaire, based on the findings of the earlier prisoner study, was constructed to evaluate the lay population’s views on the prison-issue oral health kit.

Results: It was found that 81% of prisoners (99) and 66.7% (32) of lay people disliked the toothbrush. The toothpaste was disliked by 70% (85) of the prison population and 58.3% (28) of the lay group.

Conclusion: Prisoners had a more negative view of both the prison issue toothbrush and the toothpaste than did the lay population. However, the majority of prisoner and lay group members considered that the brush and paste were of poor quality. Improving the quality of the prison-issue toothbrush and toothpaste may improve prisoners’ motivation regarding oral health and hygiene and so influence their motivation and ability to clean effectively.

Key words: Prisoners, oral health, toothbrush and toothpaste

Introduction

The available studies of prison populations have revealed poor oral health, including poor oral hygiene (Cunningham et al., 1985; Csikar et al., 2001; Jones et al., 2005; Lunn et al., 2003; Mixson et al., 1990; Salive et al., 1989). Wright et al. (2001) reported that a high proportion of prisoners have attributed their poor oral hygiene to the prison-issue oral health kit, which is held in low regard.

Heidari et al. (2008) investigated the oral health of 122 prisoners in HMP Brixton using a questionnaire and oral examination. Within the oral health section of the questionnaire, which was based on the literature and one of the author’s (EH) experience of prison dentistry, the prisoners’ views were sought on the prison-issue toothpaste and toothbrush (referred to as the oral health kit from here onwards). The outcome of these interviews indicated that, on the whole, prisoners criticised the oral health kit. A proportion of them blamed the perceived inadequacy of the kit for their poor oral hygiene. The responses stimulated the researcher to seek the opinions of non-prisoners on the oral health kit, to establish if the prisoners’ view of its inadequacy was justified.

The prison-issue kit is supplied free to all inmates. It costs the prison 39 pence per kit and comprises a standard toothbrush and toothpaste (Figure 1). HMP Brixton also offers a branded toothpaste and toothbrush for sale at £1.70 and £2.90, respectively.
The toothbrush has a slender head with four rows of bristles. The head is 35mm in length and tapers from 13mm in width at the handle end to 7mm at its distal end. The bristles are 11mm long with a diameter of 1mm, and Figure 1 shows the configuration of the tufts. The handle measures 150 x 12 x 4mm, giving the brush an overall length of 185mm.

The prison-issue toothpaste ‘Fresh Mint’ (Sejem®) is a white, mint flavoured cream containing aqua, hydrated silica, sorbitol, cellulose gum, sodium laureth sulfate, aroma, sodium saccharin, sodium fluoride 0.22% w/w (1,000ppm F), sodium benzoate, limonene, and C177891. It is supplied in a 50ml plastic tube.

The aim of this study was to gain the views of lay people on the oral health kit and compare them with the views of the HMP Brixton prison population. The null hypothesis was that there would be no difference in the two sets of views.

**Method**

Ethical approval for that study was obtained from the Northern and Yorkshire Multi-Centre Research Ethics Committee, in its capacity as the body that oversees ethical approval for prison research. The views of a convenience sample of 122 prisoners in HMP Brixton were sought on the prison issue oral health kit as part of a previous study on prisoner oral health (Heidari et al., 2008) were used to develop a simple questionnaire to evaluate lay population views on the prison issue oral health kit (Figure 2).

The size of the lay population sample (48) in this study was determined by the number of oral health kits provided by HMP Brixton. The lay group comprised a convenience sample of 29 prison health care staff (recruited at a prison health care staff meeting) and 19 non-prison associated people (comprising health-care professionals and non-health care professionals). The study members were invited to use the kit for one week and to record and return their views relating to the oral health kit via the questionnaire. Informed consent was obtained from each lay participant prior to the study.

Statistical analysis of the results was not undertaken due to the small size of the lay group, and the results are presented descriptively.

**Results**

The response rate to questions about the prison-issue oral health kit from which these findings are drawn, was 100%.

**Prisoners views**

Toothbrush: 81% (n=99) of the 122 prisoners reported disliking the toothbrush. The remaining 19% (n=23) deemed it adequate. Of those who disliked it, the main reason for doing so was given as: the bristles were too hard (44.5% (n=45)); the bristles were too soft (16.2% (n=16)); the brush handle was too short (17.2% (n=17)); the brush design was inadequate (13.1% (n=13)); the brush was painful to use (5% (n=5)); and the brush was not flexible (4% (n=4)).

Toothpaste: The toothpaste was considered adequate by 30% (n=37) of the 122 prisoners and disliked by 70% (n=85). The main complaints related to its texture and flavour. It was described variously as watery, chalky, flavourless, lacking taste and too strong. The quality was considered to be inferior and was described as hard, gritty, and non-foaming. It was also criticised for not being a recognised brand, being of low standard, and not freshening the breath.

**Lay views**

The response rate from the 48 lay members who participated in this study was 100%.

Toothbrush: Overall, 66.7% (n=32) of the lay group of 48 disliked the toothbrush, and 33.3% (n=16) found it acceptable; 50% (n=16) of the prison staff and 84% (n=16) of the non-prison related group disliked the toothbrush. The main criticisms were that the handle was too thin and small for adult use and the texture of the bristles was inadequate.

Toothpaste: Overall, 58.3% (n=28) of the lay group disliked the toothpaste. The remaining 41.7% (n=20) found
Thank you for agreeing to try this toothbrush and toothpaste and to provide your views on them. Please provide one answer only to each question by placing a tick in the corresponding box.

1. What did you think about the prison issue toothbrush?
   a. OK  ✚  Go to question 3
   b. Liked it  ✚  Go to question 3
   c. Uncertain  ✚  Go to question 3
   d. Disliked it  ✚  Go to question 2.

2. What did you dislike about the toothbrush?
   a. Bristles were too soft  
   b. Bristles were too hard  
   c. Head too small  
   d. Bristles were not adequate  
   e. Other  Please specify__________________

3. How long did you use the toothbrush for?
   a. Used it once  
   b. Used it for a while  
   c. Until a new toothbrush was needed  
   d. Other  Please specify _________________

4. Would you use the toothbrush again?
   a. Yes  
   b. No  Please specify__________________

5. What did you think about the prison issue toothpaste?
   a. OK  ✚  Go to question 7
   b. Liked it  ✚  Go to question 7
   c. Uncertain  ✚  Go to question 7
   d. Disliked it Please specify_______________  Go to question 6

6. What did you dislike about the toothpaste?
   a. Did not froth  
   b. Tasted unpleasant  
   c. Texture was chalky  
   d. Other  Please specify _________________

7. How long did you use the toothpaste for?
   a. Tried it once  
   b. Tried it for a while  
   c. Until the tube was finished  
   d. Other  Please specify _________________

8. Would you use the toothpaste again?
   a. Yes  
   b. No  Please specify _________________

Please add any further comments you may have on the prison issued toothbrush and toothpaste.

Thank you for your co-operation. Your time and effort means a lot.
it acceptable; 48% (n=14) of the prison staff and 74% (n=14) of the non-prison associated participants described the toothpaste as being chalky, grainy or gritty, non-frothing, or not feeling as if it had cleaned the teeth adequately.

**Acceptability**

Of the prisoners, 19% regarded the toothbrush as acceptable and 30% thought the toothpaste was adequate. Overall, 35.4% of the lay group (35% (n=10) of the prison staff and 37% (n=7) of the others) said they would consider using the prison issue toothbrush again. A similar overall proportion of the lay group (41% (n=12)) of the prison staff and (26% (n=5)) of the others said they would consider using the prison issue toothpaste again.

**Tables 1 and 2** compare the views of the prisoner and lay groups on the prison oral health kit. Prisoners tended to have a more negative view of both the toothpaste and the toothbrush than did the lay group, 81% and 66.7% respectively for the brush, and 70% and 58.3% respectively for the paste. The majority of both groups considered the brush and paste inadequate.

**Discussion**

The prisoner and non-prisoner surveys contributing to this study were conducted separately in different time frames, and both used unmatched convenience samples. This, plus the small size of the lay group, requires that caution is used in interpreting the results. However, whilst previous research has identified the criticism levied at the prison issue oral health kit (Wright et al., 2001), this is the first study to recognise the underpinning reasons for the disapproval. Additionally, it is the first to seek the views of a non-prison population on the prison issue oral health kit.

**Prisoners’ oral health behaviour**

Despite the fact that the prisoners’ opinions of prison issue toothbrushes and toothpastes were low (Heidari et al., 2008; Wright et al., 2001), the former state that 70% (n=55) of prisoners reported brushing their teeth twice daily. This did not necessarily lead to improved oral hygiene as oral examination disclosed high levels of plaque and periodontal disease, with 82% of the recorded sites having pocket depths of 4-6mm. The reasons for this may include ineffective tooth brushing techniques as well as other factors such as smoking-related suppression of gingival bleeding, since 80% of the prison study group smoked. This masking of the signs of periodontal disease may, in turn, delay individuals seeking oral health assessment and allow periodontal disease to remain unchecked.

The oral health kit

Davies et al. (2003) have described the optimal characteristics of a toothbrush as:

- A handle size appropriate to the user’s age and dexterity
- A head size appropriate to the user’s mouth
- A compact arrangement of soft, end-rounded nylon filaments not greater than 0.009 inches (0.4mms) in diameter, and
- Bristle patterns which enhance plaque removal in the approximal spaces and along the gum margin.

The modifications of length and position of bristles, size and shape of brush head and length of handle in modern manual toothbrushes have been recognised as successful improvements in toothbrush design (Saxer and Yankell, 1997).

On the whole, prisoners disliked the prison issue toothbrush and considered it to be of poor quality (Table 1). The main criticism they levelled at its design was the texture of the bristles, with 44% and 16% of those people who disliked it finding the bristles too hard or too soft, respectively. The diameter of bristles at 1mm is greater than the 0.4mm recommended by Davies et al. (2003) and may have contributed to the adverse comments. For 17% of those who disliked the brush, the main reason was that they found the toothbrush handle too short, making it difficult to hold, and possibly not in accord with the recommendations of Davies et al. (2003) of ‘a handle size appropriate to the user’s age and dexterity’.

Two-thirds (66.7%) of the lay group disliked the toothbrush, with more of the non-prison related subgroup than the prison staff subgroup, finding it unacceptable (84% and 55%, respectively). The main criticisms were similar to those of the prisoners – the texture of the bristles was considered inadequate (with 59.4% and 34.3% of those people who disliked the brush finding the bristles too hard or too soft, respectively). Only two of the 32 people (6.3%) disliking the brush, gave the size of the brush handle (too thin and short for an adult use) as the main reason for their dislike.

Davies (2006) has also described the optimal qualities of toothpaste. The paste should have the ability to: remove plaque; food debris and extrinsic stains; leave the mouth feeling clean; taste acceptable; be easy to use; be stable and safe with minimal side-effects; be affordable; and deliver cosmetic and medical benefits.

Overall, the quality of the prison issue toothpaste was assessed as poor by both the prisoner and lay groups, with 70% and 58.3%, respectively, stating that they disliked it. Reference was made by both groups to its unpleasant taste and texture, and, by some, to its lack of ability to foam.

In 2003, Davies et al. suggested that oral health benefit...
## Table 1. Prisoner and lay opinions of the prison-issue toothbrush

<table>
<thead>
<tr>
<th>Views on prison-issue toothbrush</th>
<th>% (number) of total prison population (n= 122)</th>
<th>% (number) of lay group (n=48)</th>
<th>% (number) of prison staff in lay group (n=29)</th>
<th>% (number) of ‘other’ non-prison population in lay group (n=19)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considered it acceptable</td>
<td>19 (23)</td>
<td>33.3 (16)</td>
<td>45 (13)</td>
<td>16 (3)</td>
</tr>
<tr>
<td>Disliked it</td>
<td>81 (99)</td>
<td>66.7 (32)</td>
<td>55 (16)</td>
<td>84 (16)</td>
</tr>
<tr>
<td>Used it for a while</td>
<td>N/A</td>
<td>56.3 (27)</td>
<td>58 (17)</td>
<td>52 (10)</td>
</tr>
<tr>
<td>Would not use it again</td>
<td>N/A</td>
<td>64.6 (31)</td>
<td>65 (19)</td>
<td>63 (12)</td>
</tr>
<tr>
<td>Reasons for disliking the toothbrush</td>
<td>% (number) of prisoners disliking the toothbrush (n=99)</td>
<td>% (number) of lay group disliking the toothbrush (n=32)</td>
<td>% (number) of prison staff subgroup disliking the toothbrush (n=16)</td>
<td>% (number) of non-prison staff subgroup disliking the toothbrush (n=16)</td>
</tr>
<tr>
<td>The bristles were too soft</td>
<td>16.2 (16)*</td>
<td>37.6 (12)*</td>
<td>50.0 (8)*</td>
<td>25.0 (4)*</td>
</tr>
<tr>
<td>The bristles were too hard</td>
<td>44.5 (44)*</td>
<td>31.2 (10)*</td>
<td>12.5 (2)*</td>
<td>50.0 (8)*</td>
</tr>
<tr>
<td>Brush design not adequate</td>
<td>13.1 (13)*</td>
<td>25.0 (8)*</td>
<td>37.5 (6)*</td>
<td>12.5 (2)*</td>
</tr>
<tr>
<td>Brush handle too short</td>
<td>17.2 (17)*</td>
<td>6.2 (2)*</td>
<td>0.0 (0)*</td>
<td>12.5 (2)*</td>
</tr>
<tr>
<td>Other</td>
<td>17.2 (17)*</td>
<td>0.0 (0)*</td>
<td>0.0 (0)*</td>
<td>0.0 (0)*</td>
</tr>
</tbody>
</table>

* Expressed as a percentage of the number of people who disliked the toothbrush.

could be derived from a toothpaste with a high fluoride content (1,500ppm) to help combat decay; and from a paste containing triclosan to provide greater periodontal disease protection. Despite the recognition that prisoners generally have poor oral health (Csikar et al., 2001; Cunningham et al., 1985; Jones et al., 2005; Lunn et al., 2003; Mixson et al., 1990; Salive et al., 1989) and the acceptance that the caries preventing effect of fluoride in toothpaste is concentration dependent, the prison-issue toothpaste does not have a high fluoride content, currently containing 1,000ppm. Nor does the prison-issue toothpaste contain triclosan, the most commonly used antimicrobial agent in commercial toothpastes to help combat periodontal disease.

The cost of supplying high quality toothbrushes and toothpastes need not necessarily be high. However, the cost of purchasing branded oral health kits may be perceived as high by local prisons with a high turnover of remand prisoners. They provide prisoners with the option of purchasing branded oral health kits at a subsidised price. However, prisoners have limited earning potential within the prison establishment. The subsidised, branded oral health kits remain relatively costly and may not be seen as a priority for their limited spending.

Prison dental services are currently unable to meet the dental treatment needs of prisoners (Department of Health, 2003). Consequently, there is a requirement on prisons to only manage urgent dental treatment needs for remand prisoners (Department of Health, 2003). Provision of a prison-issue toothpaste with a high concentration of fluoride (1,500ppm) and containing an antimicrobial agent, such as triclosan, would help to prevent further dental disease. This could be a cost-effective way of contributing to managing the oral health of prisoners.

Further research is required to identify the long-term benefits of improving the quality of the prison-issue toothbrush and toothpaste on prisoners’ oral health. However, it is likely that the provision of a well-designed toothbrush and a toothpaste with acceptable qualities, a high level of fluoride and an antimicrobial agent (such as triclosan) would permit prisoners to practise oral hygiene to a higher standard and so improve their oral health.
Acknowledgements
The authors express their gratitude to the participants and the staff of HMP Brixton.

References


Table 2. Prisoner and lay opinions of the prison-issue toothpaste

<table>
<thead>
<tr>
<th>Views on prison issue toothpaste</th>
<th>% (number) of total prison population (n = 122)</th>
<th>% (number) of lay group (n = 48)</th>
<th>% (number) of prison staff in lay group (n = 29)</th>
<th>% (number) of ‘other’ non-prison population in lay group (n = 19)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considered it acceptable</td>
<td>30 (37)</td>
<td>41.7 (20)</td>
<td>52.0 (15)</td>
<td>26 (5)</td>
</tr>
<tr>
<td>Disliked it</td>
<td>70 (85)</td>
<td>58.3 (28)</td>
<td>48.0 (14)</td>
<td>74 (14)</td>
</tr>
<tr>
<td>Used it for a while</td>
<td>N/A</td>
<td>62.5 (30)</td>
<td>62.5 (18)</td>
<td>63 (12)</td>
</tr>
<tr>
<td>Would not use it again</td>
<td>N/A</td>
<td>64.6 (31)</td>
<td>59.0 (17)</td>
<td>74 (14)</td>
</tr>
</tbody>
</table>

Reasons for disliking the toothpaste

<table>
<thead>
<tr>
<th>Reasons for disliking the toothpaste</th>
<th>% (number) of prisoners disliking the toothpaste (n = 85)</th>
<th>% (number) of lay group disliking the toothpaste (n = 28)</th>
<th>% (number) of prison staff subgroup disliking the toothpaste (n = 14)</th>
<th>% (number) of ‘other’ non-prison staff subgroup disliking the toothpaste (n = 14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>It had an unpleasant taste</td>
<td>51.0 (43)*</td>
<td>53.6 (15)*</td>
<td>57 (8)*</td>
<td>50 (7)*</td>
</tr>
<tr>
<td>The texture was chalky/hard/gritty</td>
<td>28.2 (20)*</td>
<td>32.1 (9)*</td>
<td>29 (4)*</td>
<td>36 (5)*</td>
</tr>
<tr>
<td>It did not froth/foam</td>
<td>8.0 (7)*</td>
<td>14.3(4)*</td>
<td>14 (2)*</td>
<td>14 (2)*</td>
</tr>
<tr>
<td>Other</td>
<td>17.5 (15)*</td>
<td>0 (0)*</td>
<td>0 (0)*</td>
<td>0 (0)*</td>
</tr>
</tbody>
</table>

* Expressed as a percentage of the number of people who disliked the toothbrush.

Conclusions
The current study indicates that the majority of both the prisoner and lay groups have similar opinions of the prison-issue toothbrush and toothpaste, finding them inadequate, thus supporting the null hypothesis that there would be no difference in the two sets of views. However, the size of the lay group, and subgroups, were not large enough to provide reliable statistical analysis. A larger matched study with sample groups selected randomly and in the same time frame would be required to provide a reliable evidence base.

Improving the quality of the prison-issue toothbrush and toothpaste may improve prisoners’ motivation regarding oral hygiene and so influence their motivation and ability to clean effectively. Provision of a toothpaste with a high concentration of fluoride and containing an antimicrobial agent, such as triclosan, may help combat caries and periodontal disease, respectively, thus improving prisoners’ oral health.

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