

Public perception of cross-infection control in dentistry

W. Murray Thomson*

Judith F. Stewart*

Knute D. Carter*

A. John Spencer†

Abstract

Since the advent of HIV/AIDS at the beginning of the 1980s, concern has generated considerable impetus for change in cross-infection control procedures in dentistry. This process has been hastened partly by media coverage which, in tending to favour sensation over rational discourse, has played a not inconsiderable role in shaping public understanding and expectations. This study aimed to investigate public perceptions of cross-infection control in dentistry in Australia using a postal follow-up to the 1995 National Dental Telephone Interview Survey. The postal survey response rate was 85.2 per cent. Concerns about the procedures used by their dentist to sterilize instruments were reported by 13.3 per cent of respondents overall, and this was greater among non-health-card-holders, individuals who mainly spoke a language other than English in the home, and those who reported a non-routine dental visiting pattern. Avoidance or delaying of dental visits due to the perceived cross-infection risk was reported by an overall 3.6 per cent of people, and this was higher among females and those who expressed concern about cross-infection control. The profession has a responsibility to ensure that information on the measures which have been taken to reduce the risk of cross-infection in dentistry is disseminated as widely and as clearly as possible so that undue public concern and avoidance of dental care are minimized.

Key words: *Cross-infection control; dentists; public perception.*

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Introduction

Dental practice has undergone discernible change since the introduction of HIV/AIDS to the western world at the beginning of the last decade. Heightened awareness among dental practitioners of cross-infection risks has meant that barrier procedures (gloves, masks, eye protection) and the use of autoclaves are now commonplace in the dental surgery. While much of the impetus for change has come from within the profession, it is probable that changing public expectations for cross-infection control have also played their part, fuelled by media coverage which has often appeared to sensationalize the issue rather than promote rational discourse.

The recent scientific literature has featured several studies which aimed to explore the extent of public knowledge of cross-infection control in dentistry. In 1988, a national telephone interview survey was conducted in the United States to assess public concern about HIV/AIDS and dentistry, and the results pertaining to dental attenders have been reported.¹ The study found that 30 per cent of users of dental services had thought about the possibility of contracting HIV through dental treatment, and almost two-thirds of those expressed concern about it. This was higher among very frequent attenders, anxious patients, and those living in areas of high AIDS prevalence. Most respondents preferred that barrier control techniques be used by their dentist.

There were two British studies of dental cross-infection control knowledge in the late 1980s. A survey of hospital and general dental practice patients in Western Scotland found that 60 per cent were aware that dentists should routinely wear gloves, and few minded the dentist wearing a mask and gloves during treatment.² However, a great deal of confusion and anxiety was revealed about dental

*AIHW Dental Statistics and Research Unit, The University of Adelaide.

†Department of Dentistry, The University of Adelaide.

Table 1. Number of 1995 National Dental Telephone Interview Survey participants contacted for postal survey follow-up and percentage who responded, by age group, gender, and self-reported dental status

| | Age group | | | | Totals |
|---------------------|-----------|-------|-------|------|--------|
| | 18-34 | 35-44 | 45-64 | 65+ | |
| Dentate | | | | | |
| Males | | | | | |
| Contacted | 177 | 103 | 138 | 54 | 472 |
| % Response | 75.1 | 82.5 | 88.4 | 88.9 | 82.2 |
| Females | | | | | |
| Contacted | 192 | 130 | 177 | 62 | 561 |
| % Response | 82.8 | 90.8 | 90.4 | 96.8 | 88.6 |
| Edentulous | | | | | |
| Males | | | | | |
| Contacted | 0 | 2 | 11 | 32 | 45 |
| % Response | 0.0 | 50.0 | 81.8 | 71.9 | 73.3 |
| Females | | | | | |
| Contacted | 0 | 5 | 37 | 65 | 107 |
| % Response | 0.0 | 40.0 | 91.9 | 86.2 | 85.6 |
| Combined | | | | | |
| Males | | | | | |
| Contacted | 177 | 105 | 149 | 86 | 517 |
| % Response | 75.1 | 81.9 | 87.9 | 82.6 | 81.4 |
| Females | | | | | |
| Contacted | 192 | 135 | 214 | 127 | 668 |
| % Response | 82.8 | 88.9 | 90.7 | 91.3 | 88.2 |
| Whole sample | | | | | |
| Contacted | 369 | 240 | 363 | 213 | 1185 |
| Responded | 292 | 206 | 325 | 187 | 1010 |
| % Response | 79.1 | 85.8 | 89.5 | 87.8 | 85.2 |

cross-infection control issues in general, with one-third of patients ignorant about dental sterilization methods. A 1988/89 survey of regular patients of an industrial dental service in Liverpool (UK) found that subjects' awareness from news media led them to rate dentistry as a lower HIV transmission risk than blood transfusion, operating theatres and acupuncturists.³ In common with the American study, the risk from dental practice was rated higher than that from general medical practice. In a striking parallel with both the American and Scottish studies, one-third of patients perceived a risk of HIV infection from dental care, and a higher proportion of women than men believed in a dental risk.

To date, there have been no population-based reports of public perceptions of dental cross-infection control in Australia. The overseas studies focused on the perceptions of dental patients and have provided valuable information, but, without data from the broader Australian population, it is impossible to answer questions such as (1) whether particular groups differ in their perception of cross-infection control in dentistry; (2) whether routine dental attenders and those who attend only when they have a dental problem differ in their concerns about dental cross-infection control; and (3) whether some non-routine-attenders are deterred from seeking care because of such concerns. This study aimed to clarify those issues and provide national data on public perceptions of cross-infection control in Australian dentistry.

Methods

The survey was conducted as a postal follow-up to the 1995 National Dental Telephone Interview Survey (NDTIS),⁴ which collected data from a random sample of Australian residents aged five years and over in all States and Territories. Telephone numbers for the survey were randomly sampled from the most recent edition of the electronic 'white pages' listing. A separate sample was selected for each State or Territory, resulting in eight strata and a total of 5101 participants in the survey. Standard telephone interview methods^{5,6} were employed, including a primary approach letter which was sent to the address associated with each number approximately 10 days prior to the first interview attempt. Up to six calls were made at varying times of the day and week to each sampled telephone number, after which, if there had been no answer, the number was abandoned and designated a non-contact outcome. At the time of telephone contact, it was ascertained that the number served a residential dwelling, and then selection was made of the target person. When only one person resided at the dwelling, that person was interviewed. At other dwellings, the person answering the telephone was asked to name the resident aged five years or more who was due to have the next birthday, as well as the resident who had the last birthday. A computer program then randomly selected one of those names as the target person. Up to six attempts were made to directly contact the target person. Proxy interviews were conducted where the target person was (1) aged 15 or under; (2) unable to communicate due to illness or language barriers (although interviews were conducted using interpreters where

Table 2. Key background characteristics and dental status

| | Percentage |
|------------------------------|------------|
| Gender | |
| Male | 41.7 |
| Female | 58.3 |
| Age group | |
| 18-34 | 28.9 |
| 35-44 | 20.4 |
| 45-64 | 32.2 |
| 65+ | 18.5 |
| Income group | |
| \$30,000 or less | 48.1 |
| Over \$30,000 | 51.9 |
| Education level | |
| Secondary and under | 39.4 |
| Tertiary | 60.2 |
| Entitlements | |
| Card-holder | 23.4 |
| Non-Card-holder | 76.6 |
| Language used in home | |
| English | 92.6 |
| Other | 7.4 |
| Dental status | |
| Dentate | 87.6 |
| Edentulous | 12.4 |

Table 3. Respondents' cross-infection control (CIC) concern and its effect on dental care-seeking, by key background characteristics, number of teeth, and use of dental services

| | Have concerns re sterilization procedures ^(a) (%) | Have avoided or delayed visits due to CIC risk ^(b) (%) |
|-------------------------------|---|--|
| All subjects | 13.3 | 3.6 |
| Gender | | |
| Male | 15.8 ^(c) | 2.2 ^(c) |
| Female | 11.4 | 4.7 |
| Age group | | |
| 18-34 | 16.2 | 4.5 |
| 35-44 | 14.1 | 2.4 |
| 45-64 | 11.8 | 3.7 |
| 65+ | 10.1 | 3.6 |
| Income group | | |
| \$30,000 or less | 11.4 | 4.9 |
| Over \$30,000 | 14.5 | 2.6 |
| Education level | | |
| Secondary and under | 11.2 | 3.4 |
| Tertiary | 14.4 | 3.9 |
| Entitlements | | |
| Card-holder | 9.8 ^(c) | 4.9 |
| Non-Card-holder | 14.3 | 3.3 |
| Language used in home | | |
| English | 12.1 ^(d) | 3.1 ^(d) |
| Other | 28.4 | 10.8 |
| Dental status | | |
| Dentate | 13.4 | 3.5 |
| Edentulous | 12.3 | 4.7 |
| Usual reason for dental visit | | |
| Check-up | 10.9 ^(c) | 3.1 |
| Problem | 16.2 | 4.1 |
| Time since last dental visit | | |
| < 2 years | 13.1 | 2.9 ^(c) |
| 2+ years | 14.0 | 5.5 |
| Location of last dental visit | | |
| Private clinic | 12.5 | 3.1 ^(c) |
| Public clinic | 20.0 | 8.0 |
| Other ^(e) | 18.2 | 6.3 |

^(a)Data reported for 987 cases.

^(b)Data reported for 988 cases.

^(c)p<0.05.

^(d)p<0.01.

^(e)Dental technician or any other dental provider.

practicable); or (3) away from the household for the duration of the study. At the completion of the interview, the program randomly selected participants (aged 18+) for the follow-up postal questionnaire. A one-in-three sampling ratio was used. Subjects who failed to return their questionnaires within three weeks of the initial mail-out were sent another questionnaire and reminder note. This procedure was repeated twice more for those who failed to respond to the mail-outs.

Responses were sought to four closed questionnaire items. The available answer choices were *yes*, *no* and *don't know*. The questionnaire items were:

1. I have concerns about the procedures used by my dentist to sterilize instruments.
2. I have avoided or delayed dental visits because of the risk of infection from dental equipment.
3. My dentist wears rubber gloves when treating patients.
4. My dentist wears a mask when treating patients.

Unique identifying numbers were used to match responses from the postal questionnaire to subject's responses to the NDTIS so that responses could be analysed by key socio-demographic and geographic variables. The data were weighted in order to arrive at estimates which were valid for the greater Australian population. The weighting procedure adjusted for the over-representation of persons from smaller households which resulted from the probability of selection at the telephone interview stage being inversely proportional to household size. The procedure ensured that the sample for each stratum accurately represented the population of that stratum. These procedures made the assumption that there was no difference between respondents and non-respondents with regard to reported parameters.

The data were analysed using the SPSS statistical package, and levels of statistical significance were set at p<0.05. The analysis began with the computation of univariate statistics. Bivariate analyses used chi-square tests for significance. Concern about dental cross-infection was then used as the dependent variable in a logistic regression analysis using independent variables which emerged as significant from the bivariate analyses.

Results

Table 1 presents the numbers of participants in the parent survey who were contacted and who responded for the current study. Responses were received from 1010 of the 1185 contacts attempted, representing an overall response rate of 85.2 per cent. This was highest (96.8 per cent) among dentate females in the 65+ age group, and lowest (71.9 per cent) among edentulous males in the 65+ age group (discounting the data for edentulous females and males in the 35-44 age group because of the small numbers contacted). Overall, those aged 18 to 34 years had the lowest response rate of the four age groups, and females manifested a higher response rate than males.

Residence in major urban (capital city or other major urban) areas was reported by 721 persons (71.4 per cent), and Aboriginal people and Torres Strait Islanders made up 1.3 per cent of the sample. The age of respondents ranged from 18 to 90 years, with a mean of 47 (sd, 17 years), and females comprised 58.3 per cent of the sample (Table 2). Proportionately more males than females reported being dentate (one or more natural teeth remaining), (92.2 and 84.4 per cent, respectively). A language other than English was spoken in the home by 7.4 per cent of respondents.

Cross-infection control concerns and their consequences

Concerns about the procedures used by their dentist to sterilize instruments were reported by

Table 4. Respondents' recall of dentists' use of personal barriers to cross-infection, by key background characteristics, number of teeth, and use of dental services

| | Wears rubber gloves when treating patients ^(a) (%) | Wears a mask when treating patients ^(b) (%) |
|-------------------------------|--|---|
| All subjects | 81.8 | 67.7 |
| Gender | | |
| Male | 77.5 ^(c) | 64.7 |
| Female | 84.9 | 69.9 |
| Age group | | |
| 18-34 | 80.7 ^(c) | 64.6 ^(c) |
| 35-44 | 86.4 | 74.0 |
| 45-64 | 84.1 | 71.0 |
| 65+ | 73.3 | 58.8 |
| Income group | | |
| \$30,000 or less | 76.5 ^(c) | 59.9 ^(c) |
| Over \$30,000 | 85.7 | 74.2 |
| Education level | | |
| Secondary and under | 79.6 | 66.7 |
| Tertiary | 83.0 | 68.6 |
| Entitlements | | |
| Card-holder | 71.8 ^(c) | 56.8 ^(c) |
| Non-Card-holder | 84.6 | 71.0 |
| Language used in home | | |
| English | 81.6 | 66.8 |
| Other | 83.6 | 77.8 |
| Dental status | | |
| Dentate | 83.5 ^(d) | 69.9 ^(c) |
| Edentulous | 67.3 | 48.5 |
| Usual reason for dental visit | | |
| Check-up | 88.5 ^(c) | 77.2 ^(c) |
| Problem | 75.2 | 58.7 |
| Time since last dental visit | | |
| < 2 years | 90.7 ^(c) | 75.8 ^(c) |
| 2+ years | 60.6 | 48.3 |
| Location of last dental visit | | |
| Private clinic | 84.0 ^(c) | 69.0 ^(d) |
| Public clinic | 71.4 | 67.0 |
| Other ^(e) | 62.5 | 43.8 |

^(a)Data reported for 982 cases.

^(b)Data reported for 978 cases.

^(c)p<0.01.

^(d)p<0.05.

^(e)Dental technician or any other dental provider.

13.3 per cent of respondents overall (Table 3), and there were no significant differences between dentate and edentulous respondents. Males, non-health-card-holders, those who reported a non-routine dental visiting pattern, and those who spoke a language other than English in the home were significantly more likely to express such concern.

Avoidance or delaying of dental visiting due to the perceived cross-infection risk were reported by an overall 3.6 per cent of people (Table 3). Such behavioural consequences were greater among: females; those who had not visited in the previous two years; those whose last visit was not to a private clinic; and individuals who spoke a language other than English in the home. People who expressed concern about cross-infection control were more likely to report having avoided or delayed dental visiting because of the issue than others (13.7 per cent and 1.8 per cent, respectively; Fisher's exact test, p<0.01).

Recall of dentist's use of personal barriers

Some 81.8 per cent of respondents reported that their dentist wore rubber gloves when treating patients (Table 4). This was significantly lower among: males and those in the 65+ age group; individuals in the lower-income group; holders of Health Cards; those who had not attended a dental clinic for two or more years, or whose last visit was not to a private clinic; and edentulous respondents. Their dentist wearing a mask when treating patients was reported by 67.7 per cent of respondents, with notable differences according to age group, income, Health Card holder status, time since last visit, usual reason for and location of last visit, and dental status.

Multivariate analysis

Table 5 presents the outcome of the logistic regression analyses. The first was conducted with the dependent variable being concern about the procedures used by their dentist to sterilize instruments. Individuals who usually only visited the dentist when they had a dental problem had 1.28 times the odds – and those who spoke a language other than English at home had 1.78 times the odds – of reporting such concern. The second analysis revealed that females had 1.79 times the odds of reporting having avoided or delaying dental visits because of the risk of infection from dental equipment.

Discussion

This study's findings on the public's perception of cross-infection issues should be of interest for the dental profession in Australia. The proportion of respondents who expressed concern about their dentist's sterilization procedures is lower than might be expected, in the light of recent interest in the lay press, where there were three separate episodes of reporting (two negative, one positive) on dental cross-infection control in the six months prior to data collection (Australian Dental Association, personal communication). Given such coverage, it is perhaps surprising that this study's estimate of the extent of concern (13.3 per cent) was considerably less than the approximately one-third reported from British and US surveys.¹⁻³ It is difficult to account for such a differential, although it may be that there has been a diminution of sensationalized media coverage since those surveys, and that more patients are now aware of the cross-infection control measures which are being used in dental surgeries.

There is cause for optimism in the finding that only a small minority (3.6 per cent) of respondents reported having avoided or delayed dental visiting due to their perception of the risk of cross-infection. The only previous report on avoidance of dental care due to concerns about cross-infection control was that of Horowitz *et al.*, who found that 9.6 per cent

Table 5. Outcome of logistic regression analysis^(a)

| | Odds Ratio (95% CI) |
|--|---------------------|
| 'I have concerns about the procedures used by my dentist to sterilize instruments' | |
| Usual reason for a dental visit | |
| Check-up | 1.00 |
| Problem | 1.28 (1.06, 1.55) |
| Language mainly spoken at home | |
| English | 1.00 |
| Other | 1.78 (1.35, 2.34) |
| 'I have avoided or delayed dental visits because of the risk of infection from dental equipment' | |
| Gender | |
| Male | 1.00 |
| Female | 1.79 (1.10, 2.90) |

^(a)Logistic regression procedures were also conducted for the two barrier method variables, but no significant effects were found.

of a sample of attenders to one private practice admitted such behaviour.⁷ However, that particular estimate has limited utility due to: the low response rate (36.5 per cent); the fact that all of the respondents had previously attended one dental practice; the length of time since the data were collected; and the nature of the group under study.

The estimate derived from the current study's population-based sample would be expected to be a closer approximation to the real situation in Australia, given the high response rate and the confirmation of previous observations of the Australian population.⁸ Females were more likely in the current study than males to report avoiding or delaying dental visiting due to their perceived risk of cross-infection. This is consistent with their reported propensity to possess more health knowledge than men, and to be less likely to engage in actions that may endanger their health.⁹ Avoidance or delaying of treatment due to concerns about cross-infection control was, not surprisingly, substantially greater (13.7 per cent) among those who articulated such concern in the first place. Of more interest is that the remaining 86.3 per cent of those who expressed concern did not avoid or delay dental treatment, suggesting that, for those individuals, the anticipated impacts of not receiving dental care outweighed any perceived risk of cross-infection.

The multivariate findings offer some insight into the shaping of community concern about cross-infection control in dentistry. The greater concern among those who usually make dental visits only when problems arise may reflect both their lack of familiarity with routine, unstressful dentistry, and the distress associated with the process of receiving emergency treatment. The greater concern among those who mainly do not speak English in the home may possibly be due to a lack of familiarity with Australian dentistry, as well as general insecurity in an environment where English predominates. It is also possible that problems in communication may

reduce their exposure to reliable sources of information about cross-infection control in dentistry.

The data on respondents' recollections of their dentist's use of personal barrier methods (rubber gloves and mask) during treatment can be interpreted in several ways. Widespread use of rubber gloves within dentistry is indicated by the finding that approximately four respondents out of five reported their dentist wearing rubber gloves. However, that figure falls short of current recommendations on cross-infection control in dental practice which mandate the routine use of gloves.¹⁰ However, two factors somewhat alleviate potential concern. First, the figure exceeded 90 per cent among more recent attenders; this approximates the 87 per cent reported from a telephone interview survey of adults in Maryland, USA,¹¹ and suggests that compliance with recommended practice on the use of personal barriers among dentists may perhaps be greater than the data indicate on first examination. Second, there is evidence that dental patients' recall of dentists' use of gloves – and masks in particular – is not especially accurate. Humphris *et al.*³ found that 41 per cent of those who reported that their dentist *was* wearing a mask were wrong, while the dentist *did* wear a mask for 15 per cent of patients who reported that a mask was *not* being worn. Recollections of glove use were more accurate, although 6 per cent were wrong and 7 per cent could not remember.³ There is, therefore, the possibility that the estimates of glove and mask use obtained in the current study are not accurate. Data from practice surveys on glove and mask use would assist in clarifying this issue.

A prime issue is the message which the profession should take from the findings of this study. People's perceptions of issues such as cross-infection risk in dentistry are simply the risks as they interpret them in the light of their own knowledge and its sources (such as peers, family members and the popular media, as well as health professionals). They are inherently neither accurate nor inaccurate.¹² The onus is, therefore, upon the profession to ensure that information on the measures which have been taken to minimize cross-infection risk in dentistry is disseminated as widely as possible – and in ways by which it is easily understood – in order to minimize undue public concern and avoidance of dental care.

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Address for correspondence/reprints:

Dr W. M. Thomson,
 Department of Oral Health,
 School of Dentistry,
 The University of Otago,
 PO Box 647,
 Dunedin,
 New Zealand.