Title: Behavioral factors to include in guidelines for lifelong oral healthiness: an observational study in Japanese adults

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Author's response to reviews: see over
Dr Jo Appleford  
Senior Assistant Editor  
BMC Oral Health  

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RE: MS:  6207188421074429
Behavioral factors to include in guidelines for lifelong oral healthiness: an observational study in Japanese adults

Dear Dr Appleford,
Thank you very much for your letter of 18 September 2006, conveying the reviewer’s reports of our manuscript. We enclose a revised version of our paper in which we have tried to take into account all comments by the reviewers. We corrected and deleted items that were suggested in the first version. Also attached are our answers to the reviewers, outlining our alterations in detail.

We hope this revised version meets with your and the reviewer’s approval.

Yours sincerely,

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**Answer to Referee 1**

1) Language/misprinting correction is needed throughout the whole manuscript. The authors should consult a person with English as mother tongue.

   The paper has been revised to improve the language.

2) Information on where the dental health examination was performed is still lacking.

   The sentence was added to :Page6, Prg 4.

   “The dental health examination was conducted at the health center at Tobishima.”

3) The chapter considering statistical analysis needs comments on the actual analyses utilized.

   The sentence was added to :Page7, Prg 2.

   “Cross tabulation and odds ratio were used to assess bivariate relationships.”

   The sentence was added to :Page7, Prg 2.

   “Analyses were undertaken by using SPSS 11.0J for Windows.”

4) When discussing correlates of toothloss/number of remaining teeth some recent publications could be referred to - see for instance Kida et al., BMC Oral Health 2006; 6:5. available at www.biomedicalcentral.com/1472-6831-6-5

   The sentences were changed to :Page4, Prg 4 – Page5, Prg 1.

   Dental and oral health are affected by diet and certain aspects of lifestyle [13-24]. Burt et al [13] concluded “that total tooth loss was a social-behavioral issue as much as it is disease related”. They reported that socio-behavioral factors were less clearly related to partial tooth loss in dentate persons. In a later national study, Eklund and Burt [16] reported there were associations between total tooth loss and low income, education, perceived poor oral health, smoking and negative health behavior. Their findings on the importance of socio-behavioral factors for tooth loss were confirmed by Gilbert et al [20] who found that those 65 year old Floridians, with less positive attitudes to dentists, and who practiced dental hygiene less frequently and were
smokers had lost more tooth. Similar findings, namely that brushing teeth infrequently and being a smoker affected tooth loss, were reported by a number of authors [19,21,24]. The importance of smoking and heavy drinking as contributing factors to tooth loss in older people was also highlighted by Klein et al [22]. Some researchers reported socio-economic inequalities were related tooth loss [24-27]. The factors mentioned above may not be important in all populations. For example, in a study of two longitudinal cohorts, the Baltimore Longitudinal Study of Aging (BLSA) and the V.A. Dental Longitudinal Study (VALS), Copeland et al [23] found that in the two US adults studies the risk factors for tooth loss differed. By analyzing which factors affected tooth loss policy makers can develop guidelines for younger cohorts. All but one of the studies mentioned above were done outside Japan. Because the factors affecting tooth retention in Japan may differ from those in other countries a study was planned to establish which behavioral factors to include in guidelines that should promote an acceptable level of oral healthiness, having 20 teeth at 80 years in Japanese adults, a study was planned with the objective of determining the relationship of specific oral health related behaviors and symptoms of oral disease and number of retained teeth in a typical Japanese community.
Answer to Referee 2 Latest version

We have attempted to deal in detail with the questions posed by Referee 2 in our earlier response. It appears that has questions are almost identical to this first response.

It is in the nature of life course epidemiology where subjects are asked to remember what they and at various stages of their lives that the validity of the information given is difficult to test. We recognize this limitation and we are cautious about interpreting the findings.

Saying that the external validity of the study is difficult to evaluate does not help us. How can anyone satisfy a referee who makes such general statements?

The 1986 WHO criteria were used before 1997 the date of the next to changing the criteria during the cause of the study so kept to the 1986 version.

Were other data collected?
As we reported to the question he posed yes other data such as DMF and CPI were collected but were not reported in this paper because we were interested only in the behavioural factors related to tooth retention.

We are at loss to see how we can satisfy Referee 2.

The paper has been revised to improve the language.

Answer to Referee 2 Previous version

1) Meanwhile, the actual study has limitations to this process as the study population primarily is limited to younger/middle aged adults.

We do not full understand this point. Yes, the study is limited to younger/middle aged adults because we were interested to assess established dental disease. It is recognized that the best age to use are 30 years plus. That is why WHO uses age 35-44 for example.

Changed in “Subjects” of Page 5.

“Tobishima was chosen as the study site because it is typical of medium sized village communities in Japan. All 6,619 residents aged 20 years and over living in Tobishima were contacted and asked to participate in the annual health check recommended by the Ministry of Health, Labour and Welfare. Some of them chose to be examined at their
workplace. They were not included in this general and dental health study for logistical reasons. That explains the low response rate of 21.5% for this general and dental health survey. Nevertheless, 390 men and 387 women took part in the dental survey in 1998.” We deal with the representativeness on page 5.

2) The external validity of the study population is difficult to evaluate.

On the contrary. This community was selected by medical epidemiologists because it was considered typical for Japan. It has commercial and industrial areas and as well as smallholdings. Many people from Tobishima commute daily to adjacent cities. Perhaps the term “village” was misleading. In Japan, communities often include the word Village in its name. We have deleted the word village.

The sentences were changed in page 5, Prg. 1
“All but one of the studies mentioned above were done outside Japan. Because the factors affecting tooth retention in Japan may differ from those in other countries a study was planned to establish which behavioral factors to include in guidelines that should promote an acceptable level of oral healthiness, having 20 teeth at 80 years in Japanese adults, a study was planned with the objective of determining the relationship of specific oral health related behaviors and symptoms of oral disease and number of retained teeth in a typical Japanese community.”

3) Data are collected through self-administered questionnaires focussing on past diet and lifestyles, when participants were in elementary school and junior high school and when they were in 20s, 30s and 50s.

This is an acknowledged method for collecting lifecourse data. See for as example: Berney LR, Blane DB: Collecting retrospective data: accuracy of recall after 50 years judged against historical records. Soc Sci Med. 1997, 45:1519-1525.

The sentences were added to: Page 8, Prg.3.
“In this retrospective study, we examined the history of each subject’s behavior and subjective conditions of the oral cavity that may have influenced their dentally related behaviors. Therefore, for example, a 70-year-old man was asked to recall conditions and behaviours when he was an elementary school student 60 years ago. Views on the reliability of memories differ. Some reported that original dietary reports and
retrospective reports after 3 to 14 years have good correlation coefficients of 0.5 to 0.7 [31-33]. Berney et al. [34] reported that after a period of 50 years people recalled socio-demographic information remarkably accurately. Questions in our study were mainly about lifestyle, and we assume that the retrospective recall of their earlier lifestyle were at least as reliable as retrospective dietary reports.”

4) No information on validity of instruments is given and information bias (recall bias) must indeed be expected.

The questionnaire was validated in another community and was found to be valid. No test of recall bias was done.

5) Clinical examinations were performed according to WHO 1986 criteria. The current guidelines by WHO read 1997; it is not clear if other data than tooth presence were collected, use of dental probes for example would not be relevant for counting the number of teeth present.

Yes, other dental data such as DMF and CPI were collected but are not reported in this paper.

The sentence was added to: Page 6, Prg.4.
“Other dental data, such as DMF and CPI were also recorded but not used in the present analysis.”

6) The Discussion section is somewhat weak and with little focus on the implications of the study as regards development of the guidelines emphasized in the Introduction section.

The sentences were changed to: Page 9, Prg.2.
“Our results on behavioral factors affecting tooth retention were similar to those of other workers excepting that the importance of between meal snacks, a well established cause of dental caries, was the most significant factor linked to tooth loss in our Japanese population. This study found that in order of importance, frequency of between-meal snacks, alcohol consumption, smoking, frequency of tooth brushing,
having some hobbies, having a family dentist and consulting a dentist when dental symptoms such as bleeding gums or toothache occurred, were significantly associated with number of retained teeth.”

The sentences were changed to: Page 9, Prg.2.

“The findings from this study have implications for developing guidelines on retaining sufficient teeth to function normally in older age. The finding that diet, alcohol consumption, smoking, oral cleanliness, having hobbies and using dental services sensibly fits well with WHO guidelines on the prevention of chronic diseases and the common risk factor approach [38] and can therefore readily be incorporated with general guidelines for the Japan national health plan, “Healthy Japan 21”. The key concept underlying the integrated **Common Risk Factor Approach** is that promoting general health by controlling a small number of risk factors, may have a major impact on a large number of diseases at a lower cost and greater efficiency and effectiveness than disease specific approaches [39, 40]. Savings may be made by coordinating the work done by various specialist groups and organizations. Decision-makers and individuals will be more readily influenced by measures directed at preventing heart diseases, obesity, stroke, cancers, diabetes as well as dental diseases than if disease-specific recommendations are made.”