AIHW Dental Statistics and Research Unit
Research Report No. 9

Social Determinants of Oral Health

AIHW AUSTRALIAN INSTITUTE OF HEALTH & WELFARE

THE UNIVERSITY OF ADELAIDE AUSTRALIA

ARCPOH Australian Research Centre for POPULATION ORAL HEALTH

A nationally representative sample of 3,678 dentate adults was drawn from interviewees in the computer-assisted National Dental Telephone Interview Survey in 1999 (response = 56.6%) and the follow-up mail survey (response = 64.6%). Three social determinants (personal control, perceived stress, and social support) were investigated for their role in shaping dental behaviour and for advancing the understanding of oral health differences among socioeconomic groups.

Oral health-related quality of life

Oral health-related quality of life (OHRQoL) is one indicator of oral health. In this study, OHRQoL was assessed with the 14-item Oral Health Impact Profile. This scale measures the negative impact of problems related to teeth, mouth or dentures on physical, psychological and social dimensions of oral well-being. Scores were derived from five response categories that recorded the frequency of negative impacts over the preceding 12 months. A mean scale score of the 14 items was computed. Higher scores indicate greater negative impact, reflecting a poorer OHRQoL.

Socioeconomic position

Annual household income was used as the indicator of socioeconomic position. Eighteen per cent of respondents reported household income up to $20,000, a further 38% reported income between $20,000 and $50,000 and the remainder, 44%, reported income greater than $50,000.

Table 1: Household income (weighted data, dentate persons)

	N	Per cent	Valid %	Cum. %
Household				
Up to $12,000	237	6.5	6.9	6.9
$12,000 – $20,000	387	10.5	11.3	18.2
$20,000 – $30,000	388	10.5	11.3	29.5
$30,000 – $40,000	454	12.4	13.2	42.7
$40,000 – $50,000	459	12.5	13.4	56.1
More than $50,000	1,507	41.0	43.9	100.0
Valid total	3,432	93.3	100.0	
Missing	246	6.7		
Total	**3,678**	**100.0**		

Source: National Dental Telephone Interview Survey, 1999.

An inverse relationship between income and OHRQoL was observed. Adults with a household income up to $20,000 had impact scores above 0.60, significantly higher than the score of 0.49 for the highest income group. The finding of socioeconomic inequality in OHRQoL was consistent with evidence of an inverse social gradient for almost all health outcomes from every country for which data are available.

Table 2: Mean impact score by household income weighted data, dentate persons)

	N	Mean impact	Std. error
Household income			
Up to $12,000	230	0.61	0.05
$12,000 – $20,000	383	0.63	0.03
$20,000 – $30,000	380	0.59	0.03
$30,000 – $40,000	441	0.52	0.03
$40,000 – $50,000	456	0.55	0.02
More than $50,000	1,492	0.49	0.01
Total	**3,382**	**0.54**	**0.01**

ANOVA F (5, 3375) = 6.12, p < 0.001

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

One possible explanation for socioeconomic inequality in OHRQoL is that adults in disadvantaged circumstances are less likely to practise dental behaviours that promote OHRQoL. This explanation assumes that dental behaviours are positively associated with OHRQoL. This assumption was tested.

Dental behaviour

Dental behaviour was measured with 10 items based on the Dental Neglect Scale. Factor analysis of the items resulted in the derivation of two subscales. 'Dental Visiting' (five items) included items concerning the perceived value of regular check-ups, attendance patterns, and the priority of dental problems over other issues. The remaining five items formed the second subscale 'Dental Self-care' that addressed tooth brushing, use of dental floss, cooperation with instructions from a dental professional, dietary control, and ability to adapt behaviour to improve oral health.

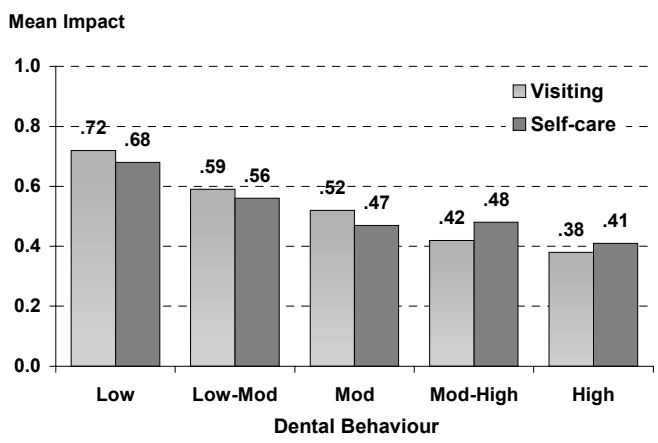
Mean subscale scores were split into five groups of approximately equal size. Group 1 comprised the lowest scores in the range, and Group 5, the highest. High scores indicated a greater propensity to make dental visits, and a greater diligence in dental self-care.

Dental behaviour and OHRQoL

Results supported the assumption of a positive relationship between dental behaviour and OHRQoL (Figure 1). As scores for dental visiting and self-care increased from Low to High levels, a corresponding decrease in the negative impact of dental problems on OHRQoL was observed.

Although both visiting and self-care were associated with OHRQoL, a greater reduction in negative impact was associated with increased visiting, i.e. utilisation, than increased self-care. Greatest decrease in negative impact for both behaviours was observed in the shift from Low to the Low-Moderate level.

Figure 1: Mean impact score by dental visiting and self-care behaviours (weighted data, dentate persons)



Dental visiting F (4, 3581) = 44.46, p < 0.001
Dental self-care F (4, 3581) = 25.46, p < 0.001

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

Socioeconomic position and behaviour

Since it has been ascertained that adults who more readily utilise dental services and practise dental self-care do report less negative impact from dental problems, the next step in explaining socioeconomic inequality in OHRQoL is to determine whether adults with low income are less likely to act in these ways.

Table 3 presents mean impact scores for Visiting and Self-care behaviours by income categories. As expected, adults with the highest household income were most likely to make dental visits, as indicated by the highest mean score for Visiting. However, visiting behaviour did not follow a socioeconomic gradient. Adults who were least likely to make regular dental visits had household incomes within the $20,000 to $40,000 category ranges. Speculatively, results may reflect access barriers to dental care faced by the working poor.

Regarding dental self-care behaviour, the results did not support the explanation that disadvantaged adults are less diligent in dental self-care. Although some inconsistency in scores was evident, adults on lowest income generally reported greatest attention to dental self-care. By contrast, adults in the highest income category were least likely to report these behaviours.

Table 3: Mean (se) dental behavioural scores by income (weighted data, dentate persons)

	Mean (SE) Impact			
	Visiting		Self-care	
Household income				
Up to $12,000	2.50	(0.05)	2.44	(0.05)
$12,000 – $20,000	2.54	(0.05)	2.44	(0.04)
$20,000 – $30,000	2.41	(0.04)	2.35	(0.03)
$30,000 – $40,000	2.43	(0.04)	2.46	(0.03)
$40,000 – $50,000	2.52	(0.04)	2.38	(0.03)
More than $50,000	2.57	(0.02)	2.35	(0.02)
Total	**2.52**	**(0.01)**	**2.39**	**(0.01)**

Visiting: F (5, 3390) = 3.32, p = 0.005
Self-care: F (5, 3390) = 2.97, p = 0.011

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

While the utilisation of dental services and the practice of dental self-care were both associated with OHRQoL, socioeconomic position was not strongly linked to these behaviours. Therefore to better understand the reasons for socioeconomic inequality in OHRQoL, attention was shifted upstream from behaviour to social environmental factors that influence health behaviour and are linked to socioeconomic position.

Social determinants

A number of conceptual models for explaining socioeconomic inequality in health has emphasised the role of social and psychosocial factors.

Among other social determinants, personal control, stress, and social support have been identified. A vast literature on the relationship between health and the two latter factors has been established, and several prospective cohort studies have demonstrated the role of personal control in explaining health inequalities.

Three scales were used to measure personal control, stress, and social support. Each was scored on a five-point Likert-style scale of agreement. Higher mean scores indicated a higher level of the measured factor.

Principal components factor analysis confirmed the underlying structure of the scales. Personal control comprised two factors: Constraints and Mastery. Stress also comprised two factors: Distress and Coping ability. Social support was shown to be a single construct.

The associations between these factors and household income were examined to test whether these factors followed a socioeconomic gradient.

Social determinants and socioeconomic position

Table 4 presents mean (se) scores for each of the five subscales/scale according to household income. Presented first are the two subscales for personal control, i.e. Constraints and Mastery. Second are the two subscales for stress, i.e. Distress and Coping. Finally, the single scale for Social support is presented.

Typically, tests that measure personal control beliefs assess expectancy beliefs about the source of control. Individuals who attribute outcomes to influences beyond their control such as to powerful others, fate or luck are said to have a higher external locus of control. Conversely, individuals who believe that they control situations in life have a higher internal locus of control.

As presented in Table 4, individuals with low income reported high Constraints. As income levels increased, a stepwise decrease in Constraint scores was observed. Thus, socioeconomically disadvantaged adults felt less able to control the conditions of their life. The reverse association was observed for Mastery. An increasing sense of Mastery with increasing levels of income was observed.

Psychological stress was comprised of two opposing constructs referred to as Distress and Coping. In this study, stress refers to chronic stress, such as ongoing exposure to economic disadvantage, as distinct from the acute stress of a critical life event.

Adults with household income in the ranges of $20,000 to $50,000 reported greatest Distress. These adults also reported lowest scores for Coping. Adults in the highest income category had highest Coping scores.

The third social factor, Social support, was measured with items that asked about the availability of different forms of social support. Four forms of social support have been identified in the theoretical literature. They are emotional support, appraisal support, instrumental support and informational support.

Results in Table 4 indicate that the distribution of Social support follows a socioeconomic gradient. Adults with higher income report a greater availability of social support.

Overall, individuals with higher household income perceived greater personal control, better coping ability, and greater access to social support.

Table 4: Mean (se) scores for personal control, stress, and social support by household income (weighted data, dentate persons)

	Personal control			
	Constraints		Mastery	
Household income				
Up to $12,000	1.58	(0.05)	2.84	(0.05)
$12,000 – $20,000	1.50	(0.04)	2.88	(0.03)
$20,000 – $30,000	1.49	(0.03)	2.92	(0.03)
$30,000 – $40,000	1.32	(0.03)	3.04	(0.03)
$40,000 – $50,000	1.23	(0.03)	2.96	(0.03)
More than $50,000	1.21	(0.02)	3.02	(0.01)
Total	**1.32**	**(0.01)**	**2.98**	**(0.01)**
Constraints: F (5, 3389) = 28.40, p < 0.001				
Mastery: F (5, 3389) = 7.99, p < 0.001				
	Stress			
	Distress		**Coping**	
Household income				
Up to $12,000	1.72	(0.05)	2.49	(0.04)
$12,000 – $20,000	1.77	(0.04)	2.68	(0.03)
$20,000 – $30,000	1.88	(0.03)	2.55	(0.03)
$30,000 – $40,000	1.85	(0.03)	2.59	(0.03)
$40,000 – $50,000	1.81	(0.03)	2.58	(0.02)
More than $50,000	1.78	(0.01)	2.73	(0.01)
Total	**1.80**	**(0.01)**	**2.65**	**(0.01)**
Distress: F (5, 3345) = 3.39, p = 0.005				
Coping: F (5, 3345) = 16.42, p < 0.001				
	Social support			
Household income				
Up to $12,000	3.35	(0.04)		
$12,000 – $20,000	3.40	(0.04)		
$20,000 – $30,000	3.41	(0.04)		
$30,000 – $40,000	3.45	(0.03)		
$40,000 – $50,000	3.46	(0.03)		
More than $50,000	3.47	(0.02)		
Total	**3.44**	**(0.01)**		
Social support: F (5, 3245) = 2.24, p = 0.048				

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

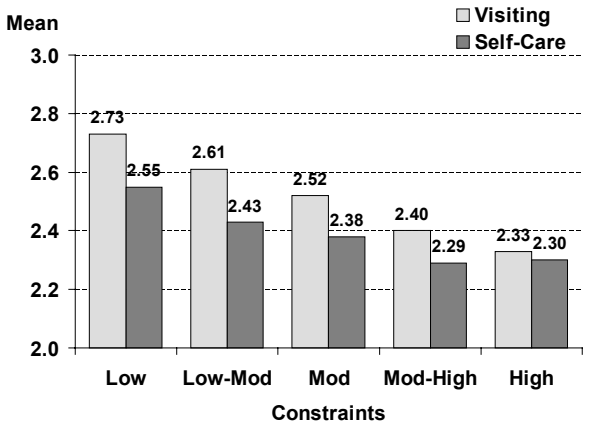
Figures 2 to 6 present graphically the relationship between these social determinants and dental visiting and self-care.

Values along the Y-axis have been truncated from a potential range of 0–4, to 2–3. All factors were significantly associated with dental behaviours and p-values are reported.

As Constraints increased from Low levels to High, mean scores for both dental Visiting and Self-care decreased.

Thus, the more individuals perceived outcomes in life to be beyond their control, the less likely they were to act in ways associated with favourable OHRQoL (Figure 2).

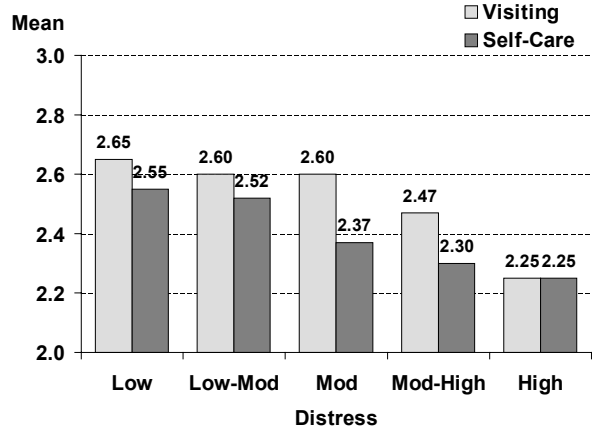
Figure 2: Mean scores for dental behaviours by Constraints (weighted data, dentate persons)



Dental visiting F (4, 3595) = 24.99, p < 0.001
Dental self-care F (4, 3595) = 18.09, p < 0.001

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

Figure 4: Mean scores for dental behaviours by Distress (weighted data, dentate persons)



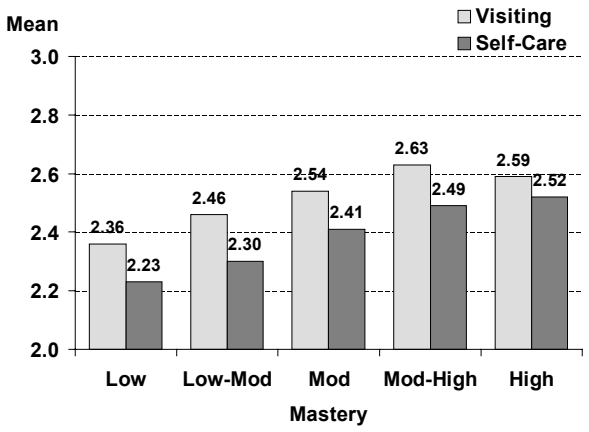
Dental visiting F (4, 3542) = 22.18, p < 0.001
Dental self-care F (4, 3542) = 25.65, p < 0.001

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

Figure 3 depicts the reverse relationship for Mastery and dental behaviour. Greater mastery was associated with better utilisation and better dental self-care.

Incremental increases in visiting were observed with increased Coping ability, and self-care also increased, but less steeply (Figure 5).

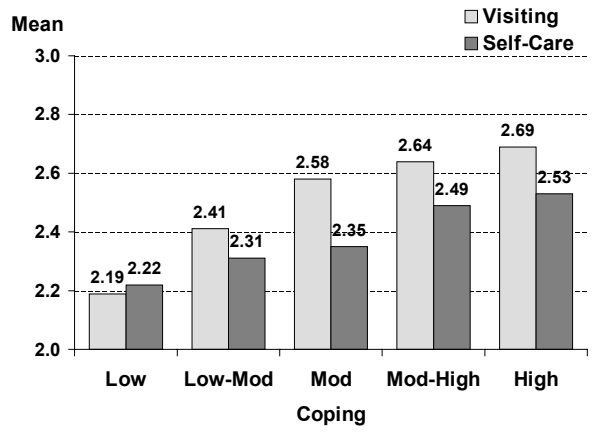
Figure 3: Mean scores for dental behaviours by Mastery (weighted data, dentate persons)



Dental visiting F (4, 3595) = 9.25, p < 0.001
Dental self-care F (4, 3595) = 21.41, p < 0.001

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

Figure 5: Mean scores for dental behaviours by Coping (weighted data, dentate persons)



Dental visiting F (4, 3542) = 34.87, p < 0.001
Dental self-care F (4, 3542) = 25.47, p < 0.001

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

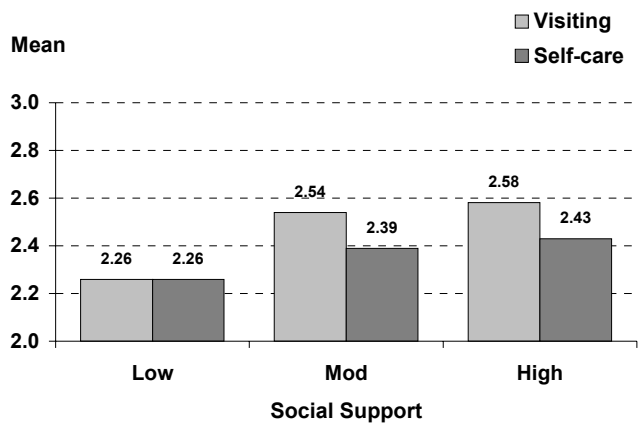
Figures 4 and 5 address the relationship between stress and dental behaviours. As levels of Distress increased, the likelihood of practicing dental self-care decreased incrementally.

Visiting also decreased, but tended to be more stable initially before decreasing once distress levels reached the moderate-high range. Increases in Distress scores were associated with greater differences in visiting than in dental self-care.

Mean scores for Social support were split into three groups of approximately equal size, rather than five. This was because most respondents expressed agreement with each statement, thus restricting the dispersion of mean scores.

As the availability of Social support increased from Low to High levels, dental visiting and dental self-care increased significantly (Figure 6).

Figure 6: Mean scores for dental behaviours by Social Support (weighted data, dentate persons)



Dental visiting F (2, 3581) = 22.21, p < 0.001
Dental self-care F (2, 3581) = 10.00, p < 0.001

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

Findings indicated that dental behaviours do not occur independently, but rather tend to cluster together. The performance of dental visiting and dental self-care was more closely associated with personal control, stress, and social support, than it was with income.

The final section examined whether OHRQoL was socially distributed according to levels of these social determinants.

Social determinants and OHRQoL

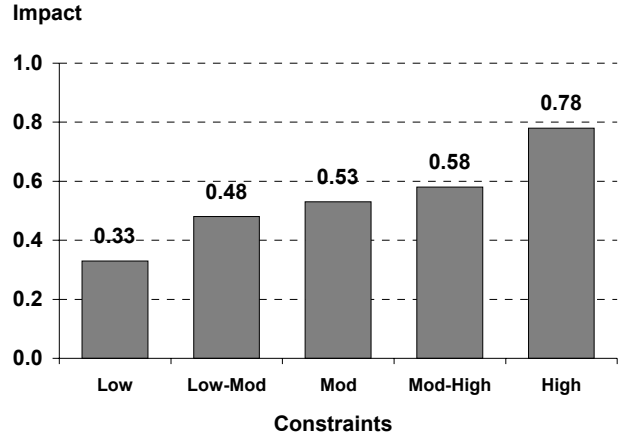
Figures 7 to 11 present results graphically using the negative impact of dental problems as the measure of OHRQoL. The Y-axis has been truncated to show mean scores in the range of 0–1.

The variation in mean impact scores was greater across levels of Constraints than across levels of Mastery (Figures 7 and 8). Individuals with low perceptions of personal constraint reported very little negative impact from problems related to their teeth, mouth or dentures (Figure 7). A stepwise gradient in increasing mean impact scores across increasing levels of Constraint was observed.

Increased perceptions of Mastery were associated with an inverse gradient in impact, but differences were less pronounced (Figure 8).

Overall, greatest variation in impact was apparent on the Distress subscale. An almost 3-fold difference in magnitude was observed, with impact increasing incrementally with increasing Distress (Figure 9).

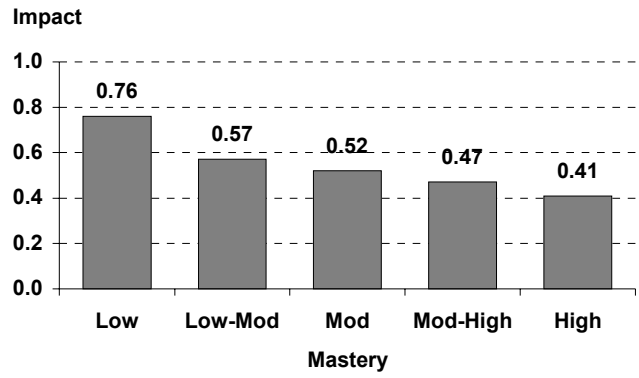
Figure 7: Mean impact by Constraints (weighted data, dentate persons)



Impact F (4, 3594) = 66.61, p < 0.001

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

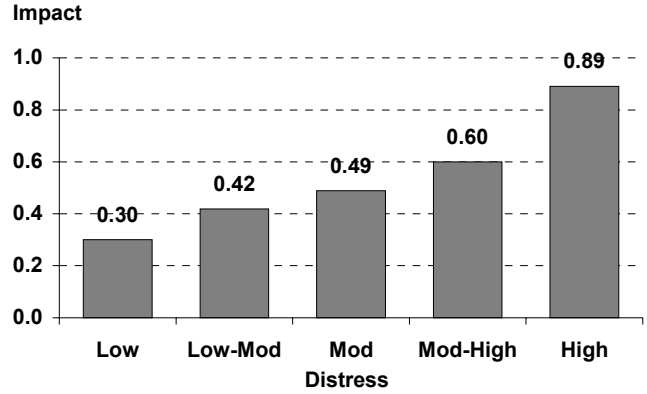
Figure 8: Mean impact by Mastery (weighted data, dentate persons)



Impact F (4, 3594) = 26.95, p < 0.001

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

Figure 9: Mean impact by Distress (weighted data, dentate persons)

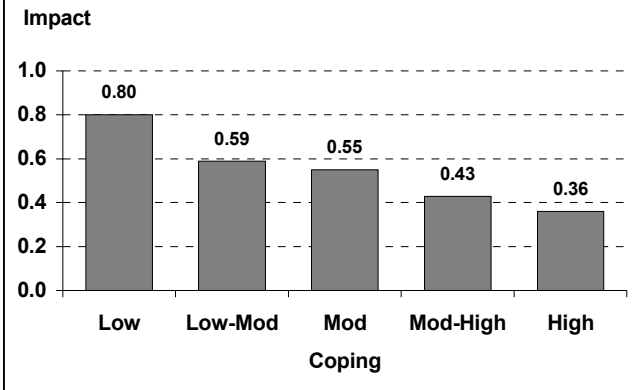


Impact F (4, 3540) = 115.13, p < 0.001

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

Results presented in Figure 10 show an incremental decrease in negative impact with increasing sense of Coping ability. In addition, an inverse association between negative impact and the availability of Social support was observed (Figure 11).

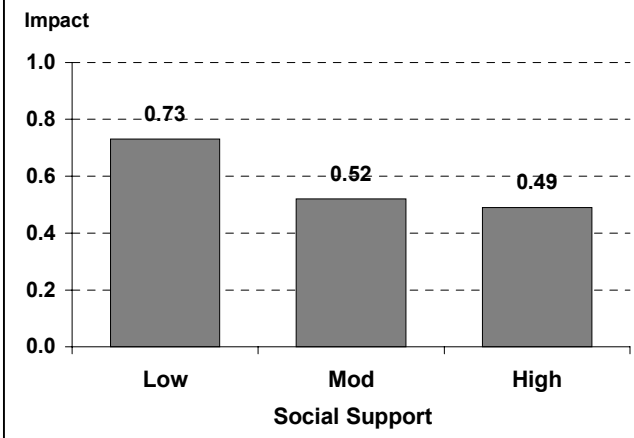
Figure 10: Mean Impact by Coping (weighted data, dentate persons)



Impact F (4, 3540) = 60.55, p < 0.001

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

Figure 11: Mean Impact by Social Support (weighted data, dentate persons)



Impact F (4, 3578) = 32.17, p<0.001

Source: National Dental Telephone Interview Survey, 1999 and Dental Health and Lifestyle Factors Survey, 1999.

Conclusions

The distribution of population OHRQoL follows a socioeconomic gradient. It is not coincidental that health inequalities mirror social inequalities. However, although correlated with oral health outcomes, income per se does not produce social inequality in subjective oral health. To advance the understanding of the social determinants of OHRQoL, this study examined a series of social determinants found in general health research to be strongly related to health outcomes.

Results showed that personal control, stress, and social support were linked to income, dentally relevant behaviours and OHRQoL.

Findings have implications for oral health promotion at both individual and societal levels. Understanding the factors that influence self-care and the use of dental services can inform behavioural interventions. In addition, the finding that social determinants of general health are also associated with oral health has implications for a common risk factor approach that takes a broader socioenvironmental view of the factors influencing health.

References

Slade GD. Derivation and validation of a short-form oral health impact profile. Community Dent Oral Epidemiol. 1997 Aug; 25(4):284–90.

Thomson WM, Spencer AJ, Gaughwin A. Testing a child dental neglect scale in South Australia. Community Dent Oral Epidemiol. 1996; 24(5):351–6.

Lachman ME, Weaver SL. The sense of control as a moderator of social class differences in health and well-being. J Pers Soc Psychol. 1998 Mar; 74(3):763–73.

Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. J Health Soc Behav. 1983 Dec; 24(4):385–96.

House JS. (1981). Work Stress and Social Support. New York: Random House.

Acknowledgements

This research was supported by the Population Health Division of the Commonwealth Department of Health and Ageing. The support of a University of Adelaide Scholarship is also gratefully acknowledged.

© AIHW Dental Statistics and Research Unit, February 2003
AIHW Catalogue No. DEN 107
ISSN 1445-7441 (Print)
ISSN 1445-775X (Online)

The AIHW Dental Statistics and Research Unit (DSRU) is a collaborating unit of the Australian Institute of Health and Welfare established in 1988 located in the Australian Research Centre for Population Oral Health, Dental School, The University of Adelaide. The DSRU aims to improve the oral health of Australians through the collection, analysis and reporting of information on oral health and access to dental care, the practice of dentistry and the dental labour force in Australia.

Published by:

AIHW Dental Statistics and Research Unit
ARCPOH, Dental School
The University of Adelaide
SOUTH AUSTRALIA 5005

For advice on specific aspects of this report please address queries to either Ms Anne Sanders or Professor A John Spencer.
Email: aihw.dsru@adelaide.edu.au
Phone: 61 8/(08) 8303 4051
Fax: 61 8/(08) 8303 4858
www.adelaide.edu.au/socprev-dent/dsru