Self-Control and Self-Confidence: Their Relationship to Self-Rated Oral Health Status and Behaviours

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Purpose: The aim of this study was to examine the relationship between self-control and self-confidence, and students' self-rated oral health and oral-health-related behaviours.

Materials and Methods: The present study sample consisted of 178 first-year medical students. The questionnaire that was used in this study included information about sociodemographic factors, behavioural factors, self-reported oral health status, self-control and self-confidence.

Results: The results showed that mean levels of self-confidence in individuals with current extracted teeth and with poor/very poor perceived gingival condition were statistically significant and lower than those with no current extracted teeth and with self-rated excellent gingival health ($P < 0.05$). Also participants with self-reported gingival bleeding showed lower values of self-control compared with those with healthy non-bleeding gingiva ($P < 0.05$). When oral health behaviour was evaluated, it was shown that students with higher scores of self-control were more likely to use everyday mouthrinses ($P < 0.05$). The multiple linear regression analyses showed, for self-rated oral and gingival health status as dependent variable, a strong association with students' self-confidence level ($P < 0.05$).

Conclusions: The results support the view that self-confidence is related with oral health status, and individuals with impaired oral and gingival health have a low self-confidence level.

Key words: oral health behaviour, oral health status, self-confidence, self-control

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Previous studies have shown that oral health behaviours are associated with various psychological traits, including self-esteem, self-efficacy, life satisfaction, optimism, sense of coherence, anxiety, depression, locus of control, stress and cynical hostility (Monteiro da Silva et al, 1995). A confluence of pathophysiological and epidemiological studies establishes that several psychosocial factors including social isolation, socioeconomic status, personality factors and character traits (e.g. hostility), anxiety, depression, and acute, chronic and subacute life stress conditions contribute to the pathogenesis of chronic periodontitis, necrotising ulcerative gingivitis, and chronic and experimental gingivitis (Monteiro da Silva et al, 1996; Genco et al, 1999; Klages et al, 2005; Trombelli et al, 2005). Research also showed that anxiety, stress and depression have a clear relationship with patients' responses to surgical and non-surgical treatments (Vettore et al, 2005).

The role of health professionals is to enable people to make sound health choices, by providing information on health promotion and by facilitating the development of skills. However, even if environments are supportive, making healthy choices will be difficult if people do not feel that they have a control over their environment and personal circumstances. An important concept in relation to this is empowerment, which is a concept that became

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a topical issue in the health literature (Koelen and Lindstrom, 2005). Empowerment can be seen as changing one's self-image or self-evaluation. Two concepts in particular summarise these themes: 'self-esteem' and 'self-confidence' or 'self-efficacy'.

While self-esteem is mainly seen as a personality trait, which has to do with the person's evaluation of himself/herself as a person of some worth, self-confidence has to do with beliefs about his/her general ability to handle situations and problems in the world; self-confidence can also refer to his/her ability to handle a specific task, in which case it is also called 'self-efficacy' (Tengland, 2007). Studies have shown self-confidence to be associated with gender (Kalaian and Freeman, 1994), happiness, loneliness (Cheng and Furnham, 2002), anxiety, perfectionism (Koivula et al, 2002), physical fitness (Hildingh et al, 2006), smoking (Zvolensky et al, 2006) and drug use (Miller, 2005). It was also shown that self-perception of oral health is an important contributor to an individual's self-esteem and psychological adjustments (Turner et al, 1998; Klages et al, 2005, 2007).

Self-control skills were defined as the interdependent operations of self-monitoring, self-evaluating and self-reinforcing (also referred to as *self-consequating* because it includes self-administered punishment) (Kanfer and Karoly, 1972). Self-control skills are deemed critical for personal adjustment when environmentally controlled reinforcement is delayed or absent. In general, self-control skills involve the ability to initiate or persist in a low-probability target behaviour in contrast to competing higher probability behaviours and without the aid of contingent environmental reinforcement or support (Mezo and Heiby, 2004). The human capacity to exert self-control is arguably one of the most powerful and beneficial adaptations of the human psyche. People are happiest and healthiest when there is an optimal fit between self and environment, and this fit can be substantially improved by altering the self to fit the world (Rothbaum et al, 1982). There is a growing body of research confirming that poor self-control leads to aggression, antisocial behaviour, and alcohol and drug abuse problems (Tangney et al, 2004; Muraven et al, 2005; Wills et al, 2006).

The aim of this study was to examine whether self-control and self-confidence are related to the students' self-rated oral health and oral-health-related behaviours. It was hypothesised that those with better self-rated oral health, who are more satisfied with the appearance of their teeth and with better oral-health-related behaviours would have a higher self-confidence and self-control level.

METHODS

Sample

The number of subjects of the study was 178 (73% females; mean (SD) age = 19.11 (1.43)) years, first-year medical students at the School of Dental Medicine, University of Medicine and Pharmacy 'Carol Davila', Bucharest, Romania, and they were invited to participate in this study at the beginning of the academic year. All students selected for this study completed a set of questionnaires. Prior to participation, the subjects gave their informed consent to participate in the study.

Measures

A purpose-designed Romanian self-report questionnaire was used in this study that addressed the following: (1) sociodemographic factors (age and gender); (2) life-style-related factors (smoking); (3) perceived oral health status (dental health, non-treated caries, satisfaction with the appearance of their teeth, dental pain, extracted teeth, gingival condition and gum bleeding) and (4) oral health habits (toothbrushing, flossing, mouthrinse frequency, dental visits and the reasons for dental visits) (Christensen et al, 2003; Persson et al, 2003; Honkala and Al-Ansari, 2005). The questionnaire also contained three questions assessing anxiety, stress and depression, namely 'Do you feel anxious (stressed and depressed) in your everyday life' with the alternative responses 'No, never' (1), 'Yes, sometimes' (2) and 'Yes, often' (3).

Self-control

Tangney et al (2004) created a self-report scale designed to measure dispositional self-control, and this scale was used in this study. The scale includes 36 items indicative of low (e.g. 'I wish I had more self-discipline') and high (e.g. 'I never allow myself to lose control') levels of self-control. Participants indicated their level of agreement with each statement using a five-point scale (1 = Not at all like me; 5 = Very much like me). Many studies have demonstrated the reliability of the self-control scale (SCS; Tangney et al, 2004; Zabelina et al, 2007). The authors measured self-control trait using the brief (13-item) version of the SCS. Previous research established the high test–retest reliability (0.87) and internal consistency ($\alpha = 0.85$) of the brief version of the SCS (Tangney et al, 2004). In this sample, the possible range of scores on the SCS was 13 to 65

and the mean score was 47.11 (SD = 6.83). All corrected item-total correlations were positive and α value was satisfactory ($\alpha = 0.718$).

Self-confidence

Self-confidence was measured with the nine-item subscale of the modified competitive state anxiety inventory-2 (CSAI-2). The original CSAI-2 consists of 27 items, divided into three nine-item subscales that assess cognitive anxiety, somatic anxiety and self-confidence (Jones and Swain, 1992). The participants respond on a 4-point scale that ranges from 1 (not at all) to 4 (very much). Each subscale total ranges from 9 to 36. The CSAI-2 appears to be a valid instrument with desirable psychometric properties (Gould et al, 1984; Martens et al, 1990; Alexander and Krane, 1996). Cronbach's alpha for the Romanian translation of the CSAI-2 subscale used in this study was $\alpha = 0.82$ (self-confidence). The analysis of inter-item (average inter-item correlation was 0.34) and item-total correlations indicated a unidimensional scale. The scales were translated into Romanian by two bilingual psychologists using back translation methods. The short form of SCS and the self-confidence subscale of the modified CSAI-2 were intercorrelated: $r' = 0.309$ ($P < 0.01$).

Statistical analyses

Descriptive statistics and statistical analyses were performed with the computerised statistical software package (SPSS 13.0, Chicago, USA). The internal consistency of the scales was examined using Cronbach's alpha. Descriptive statistics were used on all variables. The difference among the groups was examined using ANOVA with post-test and with *t* test between the two groups as appropriate. Multiple linear regression analyses were performed using age, sex, social inhibition, worry, positive and negative effects as independent variables in the study group. All reported *P* values are two tailed; moreover, $P < 0.05$ was considered statistically significant.

RESULTS

Descriptive data and group differences

The response rate was 95%, and 92.60% of the students felt that their dental health was 'normal to excellent', despite the fact that 39.90% of them reported to have current non-treated caries, 14.70% reported extracted permanent teeth and 35.50% had also experienced toothache during the previous year. Only 1.10% of the students felt that their gingival condition was poor/very poor, despite the fact that 51.70% of them reported to have gum bleeding; 89.20% of the students brushed more than twice a day. Other oral hygiene aids were used more than once a week: dental floss by 24.9% and mouthrinse by 37.10%. 81.50% of students were regular users of the dental care system (i.e. they had at least one dental visit in the previous 2 years) and 44.40% had visited the clinician in the previous 6 months.

Participants who often reported anxiety, stress and depression in everyday life presented significantly lower values of self-confidence compared with those who did not report at all (27.00 ± 4.93 versus 31.36 ± 2.77 ($P < 0.0001$), 25.57 ± 5.07 versus 32.85 ± 2.83 ($P < 0.0001$), 24.33 ± 5.89 versus 31.45 ± 2.80 ($P < 0.0001$), respectively). Also, persons with lower self-control values were found to have more stress in everyday life (44.76 ± 7.32 versus 48.47 ± 7.85, $P < 0.05$).

Association of self-control and self-confidence on self-rated oral health status and health behaviours

The results showed that mean levels of self-confidence in individuals with current extracted teeth and with poor/very poor perceived gingival condition were statistically significant and lower than those with no current extracted teeth and with self-rated excellent gingival health ($P < 0.05$). Also, participants with self-reported gingival bleeding showed lower values of self-control compared with those with healthy non-bleeding gingiva (Table 1).

To assess the relationship between self-control and self-confidence and oral-health-related behaviours, several outcome variables were used: toothbrushing, flossing, mouthrinse frequency and pattern of dental visit. Students with higher self-control scores were more likely to use everyday mouthrinses ($P < 0.05$, Table 2).

The multiple linear regression analyses showed a strong association of student's self-confidence level and self-rated oral and gingival health status as dependent variable (Table 3). The casts were well fitted to the data ($R^2 = 0.54$, $F = 2.42$, $P = 0.05$), respectively for gingival status ($R^2 = 0.078$, $F = 3.574$, $P = 0.008$). The toothbrushing, flossing and dental visit frequency were associated only with gender and age ($P < 0.05$).

Table 1 Comparison of self-control and self-confidence scales (mean ± SD) according to self-reported oral-health status

Oral-health status	Self-control	Self-confidence
Perceived dental health		
Excellent (2.8)	46.20 ± 8.95	31.60 ± 3.20
Very good (20.9)	46.26 ± 7.13	29.60 ± 3.30
Good (40.7)	47.57 ± 6.75	29.08 ± 4.30
Normal (28.2)	47.40 ± 6.52	27.86 ± 5.22
Poor/very poor (7.3)	45.21 ± 6.63	27.61 ± 4.83
P value	NS	NS
Current non-treated caries		
Yes (39.9)	47.52 ± 6.94	28.17 ± 5.05
No (60.1)	46.84 ± 6.78	29.25 ± 3.97
P value	NS	NS
Current extracted teeth		
Yes (14.7)	46.18 ± 5.98	26.61 ± 5.54
No (85.3)	47.23 ± 6.98	29.20 ± 4.15
P value	NS	$P = 0.006$
Satisfaction with the appearance of their teeth		
Yes (58.8)	46.77 ± 7.14	28.86 ± 4.66
No (41.2)	47.46 ± 6.34	28.74 ± 4.19
P value	NS	NS
Toothache last time		
Do not remember (41.2)	48.02 ± 7.10	29.53 ± 4.20
More than 1 year ago (23.2)	45.18 ± 5.66	27.53 ± 5.14
During the previous year (14.1)	47.58 ± 6.47	27.68 ± 4.11
During the previous 3 months (15.8)	46.95 ± 7.16	29.35 ± 4.16
The previous week (5.6)	46.90 ± 8.67	30.44 ± 3.85
P value	NS	NS
Self-reported gingival condition		
Excellent (5.6)	49.40 ± 6.48	31.60 ± 3.77
Very good (25.4)	47.44 ± 6.75	29.52 ± 3.73
Good (43.5)	47.19 ± 6.89	28.97 ± 4.19
Normal (23.7)	45.67 ± 6.80	27.19 ± 5.36
Poor/very poor (1.1)	49.00 ± 5.65	27.50 ± 2.12
P value	NS	$P < 0.05$
Self-reported gingival bleeding		
No signs (48.3)	48.23 ± 6.20	29.12 ± 4.06
Yes (51.7)	45.46 ± 7.51	28.91 ± 5.32
P value	$P < 0.05$	NS

Values in parentheses indicate the percentage (%); NS, not significant.

DISCUSSION

To the authors' knowledge, this investigation is the initiation to examine the influence of self-control and self-confidence on self-reported oral health status and behaviour. Self-confidence was correlated with perceived dental health, the number of extracted teeth and self-reported gingival condition, while self-control was correlated with self-reported gingival bleeding. In this study, self-control showed significant differences only in relation with mouthrinse frequency and no other significant contributions of self-control and self-confidence to oral health behaviours were observed. As a result, the findings are not consistent with those of the previous research about oral health behaviours, in which self-esteem, self-efficacy, life satisfaction, optimism, sense of coherence, anxiety, depression, locus of control, stress and cynical hostility were found to be related with the practice of oral hygiene behaviours (Monteiro da Silva et al, 1995; Moss et al, 1996; Vettore et al, 2003; Castro et al, 2006).

Table 2 Comparison of self-control and self-confidence scales (mean ± SD) according to self-reported oral-health habits

Oral-health habits	Self-control	Self-confidence
Daily toothbrushing frequency		
More than twice a day (25.4)	47.12 ± 7.35	28.49 ± 4.58
Twice a day (63.8)	47.21 ± 6.49	28.83 ± 4.51
Once a day or less (10.8)	46.30 ± 7.93	29.91 ± 3.55
P value	NS	NS
Flossing frequency		
Never (58.8)	47.11 ± 6.87	28.71 ± 4.42
Once a month (6.2)	47.35 ± 6.63	27.63 ± 5.37
Once a week (10.2)	49.83 ± 7.26	29.85 ± 3.86
More than once a week (11.3)	43.95 ± 5.88	29.97 ± 4.94
Every day (13.6)	47.60 ± 6.83	28.21 ± 4.23
P value	NS	NS
Mouthrinse frequency		
Never (54.2)	46.52 ± 6.91	29.14 ± 4.25
Once a month (8.5)	46.74 ± 5.66	29.36 ± 3.26
Once a week (10.2)	51.29 ± 5.75	29.27 ± 3.62
More than once a week (9.6)	44.76 ± 5.33	27.76 ± 5.94
Every day (17.5)	47.97 ± 7.74	27.95 ± 5.14
P value	$P < 0.05$	NS
Previous dental visit		
Less than 6 months ago (44.4)	46.61 ± 7.29	28.66 ± 4.46
6–12 months ago (22.5)	48.26 ± 5.94	28.88 ± 3.09
1–2 years ago (14.6)	45.76 ± 6.25	28.73 ± 4.82
More than 2 years ago (18.5)	47.96 ± 7.11	29.22 ± 5.56
P value	NS	NS
Reason for the dental visit		
For check-up or for tooth cleaning and scaling (48)	47.53 ± 6.78	29.28 ± 4.24
When treatment is needed or when in pain (46.9)	46.66 ± 6.87	28.10 ± 4.65
Never (5.1)	47.44 ± 7.82	31.11 ± 3.78
P value	NS	NS

Values in parentheses indicate the percentage (%); NS, not significant.

In this study, students reporting lower levels of self-confidence were more likely to perceive their oral and gingival health as poor and were more likely to present with anxiety, depression and stress in everyday life. Among adolescents, unlike the global self-esteem (measured by Rosenberg self-esteem scale) that was found to be the most dominant and powerful predictor of happiness (Furnham and Cheng, 2000), only the specific domain (academic performance) of self-confidence (measured by the Personal Evaluation Inventory) (Cheng and Furnham, 2002) and not the self-confidence total scores did predict happiness. It can be concluded that people with lower levels of self-confidence, and high levels of general anxiety, stress and depression tend to be pessimistic, and in the cognitive area they tend to misjudge the state of their dental health. It was previously shown that the perception of dental self-efficacy plays a decisive role in relation to oral health behaviour and oral hygiene (Stewart et al, 1996, 1997; Kneckt et al, 1999; Syrjälä et al, 1999; Schüz et al, 2006). In contrast with the previous reports, no significant correlations were observed in this study between self-control and oral health behaviours, probably due to the limitations of this study.

One limitation of this research is the restriction of the sample to university student population, with a majority of females, only 19 years old on average, educated and with easy access to quality dental care. The outcome measure, that is, self-rated health, could be criticised for its subjectivity. Subjects can over- or underestimate their behaviour and dental status. Although this is a legitimate concern, self-rated health also has notable strengths as an outcome measure. Self-reported oral health questionnaires are widely used in epidemiological oral

Table 3 Independent determinants of self-reported oral health status, gingival status and oral health behaviours

Variables	Predictors	*B*	SE	*t*	*P*	CI
Self-rated oral health status	Age	−0.087	0.049	−1.782	0.077	−0.183–0.009
	Gender	0.101	0.163	0.620	0.536	−0.221–0.424
	Self-control	−0.009	0.011	−0.857	0.393	−0.031–0.012
	Self-confidence	0.044	0.017	2.571	**0.011**	0.010–0.078
Self-rated gingival status	Age	−0.073	0.047	−1.529	0.128	−0.166–0.021
	Gender	0.124	0.159	0.779	0.437	−0.190–0.438
	Self-control	0.011	0.011	1.086	0.279	−0.009–0.032
	Self-confidence	0.048	0.017	2.879	**0.005**	0.015–0.081
Toothbrushing frequency	Age	−0.068	0.030	−2.229	**0.027**	−0.127–0.008
	Gender	0.265	0.101	2.614	**0.010**	0.065–0.465
	Self-control	0.005	0.007	0.725	0.469	−0.008–0.018
	Self-confidence	−0.004	0.011	−0.408	0.684	−0.026–0.017
Flossing frequency	Age	−0.024	0.081	−0.294	0.769	−0.184–0.136
	Gender	0.641	0.274	2.341	**0.020**	0.101–1.181
	Self-control	−0.006	0.018	−0.361	0.718	−0.042–0.029
	Self-confidence	0.034	0.028	1.202	0.231	−0.022–0.090
Mouthrinse frequency	Age	0.041	0.084	0.485	0.628	−0.125–0.206
	Gender	0.337	0.284	1.188	0.236	−0.223–0.897
	Self-control	0.029	0.019	1.569	0.119	−0.008–0.066
	Self-confidence	−0.039	0.029	−1.330	0.185	−0.097–0.019
Previous dental visit	Age	0.159	0.074	2.147	**0.033**	0.013–0.306
	Gender	0.279	0.249	1.124	0.262	−0.211–0.770
	Self-control	−0.011	0.016	−0.695	0.488	−0.044–0.021
	Self-confidence	0.012	0.026	0.472	0.638	−0.039–0.064
Pattern of dental visit	Age	−0.036	0.069	−0.523	0.602	−0.173–0.101
	Gender	0.436	0.232	1.879	0.062	−0.022–0.894
	Self-control	−0.005	0.015	−0.302	0.763	−0.035–0.026
	Self-confidence	0.027	0.024	1.122	0.263	−0.021–0.075

Bold face denotes statistical significance.

health investigations because they are time- and cost-effective and provide detailed information on subjects in a single health examination (Kallio et al, 1997; Gilbert and Nuttall, 1999; Buhlin et al, 2002; Airila-Mansson et al, 2004; Klinge, 2006). Self-reported gingival bleeding was found to correlate with the gingival bleeding at clinical examination, as reported previously Ankkuriniemi and Ainamo, 1997; Kallio et al, 1997; Buhlin et al, 2002). While few studies have compared self-reported questionnaires and periodontal status, those available show good overall agreement (Joshipura et al, 1996; Gilbert and Nuttall, 1999; Buhlin et al, 2002).

In summary, the present results extend the earlier findings that investigated the relations between personality traits and oral self-rated health and behaviour. This study showed that self-confidence was correlated with the number of extracted teeth, perceived dental health and self-reported gingival condition, while self-control was correlated only with mouthrinse frequency among oral health behaviours. Several researchers have revealed that oral health affects health-related quality of life and hence the general quality of life (Benyamini et al, 2004). Healthcare professionals can provide support and positive feedback and set good examples for patients. This may improve the self-care and, consequently, lead to a better physiological state that promotes success, which is the most important source of self-efficacy and self-confidence (Kneckt et al, 1999; Koelen and Lindstrom, 2005; Tengland, 2007). The authors expect that data from such research will enable dental clinicians to better understand the individual psychological factors associated with the self-rated oral health and the practice of good oral hygiene.

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