ORIGINAL ARTICLE

Cross-cultural Adaptation and Psychometric Properties of the Indonesian Version of the Self-Regulation for Dental Home Care Questionnaire

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ABSTRACT

Few studies have reported the role of motivation in patient adherence to dental-care programmes or dental home care and prevention of oral disease, particularly in Indonesia. **Objective:** To cross-adapt the Self-Regulation for Dental Home Care Questionnaire (SRDHCQ) to the Indonesian version, and to study self-regulation for dental home care among adolescents. **Methods***:* The SRDHCQ was cross culturally adapted to the Indonesian adolescents aged 12-13 years old to test its reliability and validity. Intraoral examination was conducted by a single examiner to analyse the number of decayed teeth. The SRDHCQ contains 22 questions with a 7-point scale, which comprises of integrated, identified, introjected, external regulation and amotivation domains. Respondents were randomly selected from 11 junior high schools at six districts in Jakarta. **Results:** Total respondents studied were 317 students, with prevalence of 71% of the students having decayed teeth, and average number decayed teeth was 2.1. The test and test-retest reliability and Cronbach's alpha for internal consistency were 0.838 and 0.929, respectively. No significant difference was observed in total SRDHCQ scores between genders. Construct and discriminant validity analysis showed significant results. **Conclusions:** Our results support the reliability and validity of the Indonesian SRDHCQ for adolescents in Indonesia.

Key words: Indonesia, self-regulation, validity, reliability, questionnaires

INTRODUCTION

Based on epidemiological data from several countries, experts agree that the prevalence of dental caries in children and adults is increasing worldwide.[1] Dental caries can be prevented in most people by daily oral care to remove plaque.[2] However, several people fail to maintain healthy oral hygiene by brushing and flossing their teeth less often than is recommended.[3] There are few studies on the role of motivation in patient adherence to dental-care programmes or dental home care and the prevention of oral disease, particularly in Indonesia.

For the healthcare domain more generally, we know that non-adherence to behavioural regimens is a large problem[4], but that autonomous motivation for adherence to behavioural regimens and medication prescriptions can be promoted, resulting in improved health.[5] Research has shown that oral health behaviour changes mediated by autonomy-supportive way help reduce dental plaque and gingivitis, promote dental care competence and has a more positive impact for dental treatment, home care and oral health outcomes.[5,6]

Studies in the dental field have reported positive links from autonomy support to autonomous motivation and perceived dental competence, which positively predicted dental behaviours, dental clinic attendance and self-rated oral health, and negatively predicted not making a clinic appointment.[7] The autonomy orientation is a personality-level factor that predicts that

people will take greater responsibility and show more initiative for their dental home care behaviours if they understand the importance of the behaviours.[8] Because the perceived importance of different oral health behaviours may be closely related to the identified regulation type of autonomous motivation for dental care, a study on the perceived importance of health behaviours would suggest that autonomous motivation for dental home care is related to oral health.[9] One study has shown the efficacy of an intervention to promote the self-regulation for self-care focused on good oral health practices in early childhood. The findings showed that children enrolled in the programme improved their self-regulation skills for dental self-care and developed better oral hygiene habits.[10]

A study in Jakarta showed that only 12% of the population aged 6–15 years brushed their teeth twice daily. The majority of tooth brushing was performed in the morning, and only 2% brushed their teeth for a minimum of 2 minutes.[11] Thus, determining methods of self-regulation for dental home care in adolescents in Indonesia is important, which have not been reported in the literature. The scales for measuring motivation variables were found reliable and valid in previous research, such as autonomy orientation[12], autonomy support[13], autonomous motivation toward the dental project[6], dental treatment motivation scale[14] and self-regulation for dental home care questionnaire (SRDHCQ)[15]. The SRDHCQ based on the self-determination theory measures five regulators of motivation—integrated, identified, introjected, external regulation and amotivation. Further, previous study have reported gender differences in self-regulation in the early school years.[16] The objective of this study was to cross-adapt a Self-Regulation for Dental Home Care Questionnaire (SRDHCQ) for adolescents in Jakarta, the capital city of Indonesia, test its reliability and validity, and to analyse the differences of self-regulation for dental home care between males and females.

METHODS

This study was a cross-sectional study that used self-administered questionnaire to adolescents. The study was approved by the Ethics Committee of the Faculty of Dentistry, Universitas Indonesia (Protocol No. 071421117). The SRDHCQ contained 22 questions with the total score varied from 22 to 154. The total score was calculated by summing integrated (3 items), identified (6 items), introjected (5 items), external regulation (5 items) and amotivation (3 items) domains. Responses were rated on a 7-point scale ranging from 1 (not true at all) to 7 (very true).[15] With permission from the author, the English version of the SRDHCQ was translated by a bilingual professional

Table 1. Comparison of dental caries and age between genders

	Male (n=153)	Female (n=164)	p-value
	n (%)		
Dental caries			0.373
Without caries experience	48 (31.4)	44 (26.8)	
With caries experience	105 (68.6)	120 (73.2)	
Age			0.186
12	67 (43.8)	84 (51.2)	
13	86 (56.2)	80 (48.8)	

p-values from the chi-square test results

according to the standard guidelines for cross-cultural adaptation.[17] The translation and back translation was assessed and revised by an expert panel comprising a bilingual dentist and dental public health researcher. The consensus version in Indonesian language was pilot tested in 15 adolescents aged between 12 and 13 years to determine semantic equivalence, its sensitivity to Indonesian culture and the use of proper wording.

This question was related to the satisfaction of the adolescent's oral health according to a 4-point scale (perfect=0, good=1, fair enough=2 and poor=3). Sample size estimation suggested that a minimum of 285 individuals completing the study would be sufficient for detecting statistical significance (p-value<0.05) with a power of 95%, assuming a significant correlation of 0.4. The inclusion criteria were adolescents aged 12–13 years willing to participate with parents signed the informed consent form, no conditions prevented them from answering the questionnaires and no medical history that might compromise the study outcome.

Two visits were conducted, one to obtain informed consents and a second visit for the questionnaires and caries examination. Caries were assessed according to the WHO criteria.[18] A single examiner conducted the oral health examinations with a kappa agreement of 0.94 for decay scoring. Eleven junior high schools were clustered and randomly selected from official school registries, representing six districts in Jakarta. All were public schools in an urban area with similar curricula and socioeconomic status. For reproducibility measurements, we conducted test–retest reliability with 45 adolescents who received an additional questionnaire within a week of the first administration. Reliability was tested using Cronbach's alpha and ICC. The Mann–Whitney U-test was used to analyse differences of self-regulation for dental home care between genders. Construct and discriminant validity were tested through associations and comparisons between the Indonesian version of SRDHCQ scores and the global ratings using Spearman's correlation coefficients and the Kruskal–Wallis test, respectively.

Table 2. Comparison of Self-Regulation for Dental Home Care scores between genders

	Min–Max Score	Mean ± SD		p-value
		Male	**Female**	
Total score	49–154	118.72 ± 27.04	121.65 ± 22.42	0.466
Integrated	3–21	16.46 ± 4.28	17.25 ± 3.64	0.164
Identified	15–42	35.77 ± 6.25	38.07 ± 5.00	0.001*
Introjected	6–35	25.11 ± 7.58	25.42 ± 7.40	0.759
External	5–35	26.32 ± 7.21	27.14 ± 5.89	0.402
Amotivation	3–21	15.05 ± 5.21	13.77 ± 5.66	0.041*
Controlled motivation	23–63	52.24 ± 9.83	55.32 ± 7.85	0.013*
Autonomous motivation	16–70	51.43 ± 14.09	52.57 ± 12.39	0.527

p-values from the Mann–Whitney U-test results; *Statistically significant with $p<0.05$

Table 3. Construct validity of the Self-Regulation for Dental Home Care Questionnaire

	Median (min–max)	Satisfaction with oral health	
		r	**p-value**
Total score	120 (49–154)	−0.270	<0.001*
Integrated	18 (3–21)	−0.289	<0.001*
Identified	39 (15–42)	−0.231	<0.001*
Introjected	25 (6–35)	−0.257	<0.001*
External	27 (5–35)	−0.283	<0.001*
Amotivation	15 (3–21)	−0.124	0.028*

r=Spearman's rank correlation coefficient; *Statistically significant with $p<0.05$

Table 4. Discriminant validity of the Self-Regulation for Dental Home Care by global rating question

	Mean (SD)				p-value
	Perfect	**Good**	**Enough**	**Poor**	
Total score	6.50 (0.89)	6.30 (0.93)	5.84 (1.24)	6.00 (0.89)	<0.001*
Integrated	6.70 (0.66)	6.64 (0.75)	5.97 (1.29)	6.50 (0.84)	<0.001*
Identified	6.75 (0.72)	6.72 (0.70)	6.15 (1.24)	5.47 (0.82)	0.001*
Introjected	6.60 (0.76)	6.06 (1.36)	5.56 (1.46)	5.50 (1.22)	<0.001*
External	6.55 (0.83)	6.38 (0.90)	5.82 (1.29)	6.00 (0.89)	<0.001*
Amotivation	5.56 (1.98)	5.46 (2.07)	5.35 (1.76)	5.33 (1.50)	0.024*

p-values from the Kruskal–Wallis test results; *Statistically significant with $p<0.05$

Table 5. Convergent validity of the Self-Regulation for Dental Home Care Questionnaire by caries experience

	Mean (SD)	Caries experience	
		r	**p-value**
Total score	120 (24.76)	0.140	0.040*
Integrated	16.87 (3.98)	0.121	0.054
Identified	36.96 (5.74)	0.110	0.086
Introjected	25.27 (7.48)	0.062	0.304
External	26.74 (6.55)	0.138	0.027*
Amotivation	14.39 (5.48)	-0.024	0.693

r = Spearman's rank correlation coefficient; *Statistically significant with $p< 0.05$

RESULTS

A total of 345 adolescents were recruited with a response rate of 91.6%. All participants completed all items in the Indonesian version of the SRDHCQ, and no points in the questionnaires were excluded from data analysis due to missing data. Comparison of dental caries and age between genders are shown in Table 1. The prevalence of dental caries was 71%, with average of 2.1 decayed teeth per person. Test–retest reliability was conducted with 45 adolescents. The ICC and Cronbach's alpha were 0.838 and 0.929, respectively.

This score indicated excellent reproducibility and good internal consistency.[19] No corrected item-total correlation value was <0.30, allowing all items in the instrument to be included in data analyses.

The mean score and each component of the SRDHCQ and its subscales for males and females are shown in Table 2. Males and females had similar average total scores but had significant differences in controlled motivation and amotivation. No floor or ceiling effects were evident, indicating that the questionnaire enables to detect self-regulation in a wide range. Floor or ceiling effects are considered to be present in liberal allowance if more than 20% of respondents obtained the lowest or highest appropriate score, respectively.[20] The results showed a minimum and maximum score in answering the 22 questions of 49 and 154, respectively. The percentage of respondents who scored the maximum of 154 was 15.8%.

The construct validity showed that the Indonesian SRDHCQ total score was significantly associated with the global rating scores , i.e. the adolescent's satisfaction with their oral health (p<0.05) (Table 3). The discriminant validity significantly differed between the adolescents who were satisfied and those who were not satisfied with their oral health (Table 4). The discriminant validity was also analysed with respect to respondents' caries experience. The results showed a correlation between the SRDHCQ total score and caries experience (p<0.05) (Table 5).

DISCUSSION

Through cross-cultural adaptation of the SRDHCQ into an Indonesian version, we found that psychometric properties of the Indonesian version were valid and reliable. Both Indonesian and English versions were semantically similar. The reliability of internal and test–retest consistencies of the Indonesian SRDHCQ was established. Global ratings were associated with validity. The construct and discriminant validity result showed that the Indonesian SRDHCQ was significantly associated with the adolescent's satisfaction with oral health and their caries experience. No floor or ceiling effects were observed in this study.[20]

This study showed no statistically significant differences in the total SRDHCQ scores but significantly different controlled motivation and amotivation scores between males and females, which may be because caries experience for both genders were similar but males had lower caries experience than females. Motivation is based on one's understanding of what is normal and what is pathological in the oral cavity.[21] A study assessing motivation in patients undergoing periodontal treatment showed that the motivation scores did not differ between males and females across different age groups.[14] A previous study on the motivation of dental

home care found that variables, including age, gender and socioeconomic status, were non-significantly or weakly associated with dental health-related variables.[15]

There are four types of extrinsic motivation, respectively ranging from external to introjected, identified and integrated regulation. These motivations are distinguished by the level of endorsement or autonomy of the regulated behaviours, which denote progressively more self-determined motives concerning the degree to which the behaviour has been internalised.[15,22] Extrinsic motivation can become more self-determined (autonomous) when the behaviour is performed to achieve internalised outcomes[23]. Among these four kinds of extrinsic motivation, the sum of external and introjected regulations is named controlled motivation, whereas that of identified and integrated self-regulation is termed autonomous motivation.[15] When autonomous motivation plays a role, one feels as though the behaviour is motivated by their own self-consciousness. Conversely, when controlled motivation has a role, people feel that the behaviour arises because of outside influences or the coercion of others.[15]

Based on the global question, respondents in this study were asked how satisfied they were with their oral health. The outcomes showed that the SRDHCQ could distinguish between someone who was satisfied or not with their oral health and with or without caries experience. Self-determination theory argues that the process of internalisation toward more self-determined types of motivation arises out of the psychological need for satisfaction.[15] There are three basic psychological needs that are hypothesised to be important for human development and healthy functioning, namely the needs for competence, autonomy and social relatedness.[24] Autonomy-supportive contexts, which satisfy these needs, provide nutriments for the integrative process that underlies internalisation. Satisfaction of the need for competence results from effective behaviours that lead to intended outcomes.[25]

Research has found a positive relationship between autonomy support and psychological needs satisfaction.[26] Regarding the satisfaction of psychological needs, research in exercise[27] supports a positive correlation between different mental and physical health conditions. Field studies at schools and organizations support these findings that show that controlling contexts relate to less autonomous motivation, decreased satisfaction and commitment and reduced welfare, rather than autonomy-supportive.[28]

Measurements of well-being associated with dental care are positively related between self-assessed oral health satisfaction and oral health status[29], longitudinal change in satisfaction with dental appearance based on recovery from oral health problems[30] and satisfaction with mastication ability[31]. A recent oral health study has shown that the need satisfaction among patients

was associated with high perceived dental competence and autonomous motivation for oral self-care and high scores on self-rated oral health.[15]

As limitations of this study, specific psychological need satisfaction and parental characteristics were not explored. For further study, it is necessary to measure the correlation of SRDHCQ results with respondent's needs for competence, autonomy and social relatedness related to oral health as the specific indicator, in addition to the parents' level of education and socioeconomic background.

CONCLUSION

This study developed an Indonesian version of the SRDHCQ and demonstrated its reliability and validity in adolescents. There was no significant difference in the total SRDHCQ scores between genders.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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