Does Spiritual Health Contribute To The Oral Health Behaviors in Adolescents?

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Abstract

In a search for any correlation between spiritual health and oral health among adolescents, a cross-sectional study was performed. Junior high school students from three cities in Iran, were selected by multi-stage random sampling. They answered a questionnaire including questions on oral health-related behaviors and spiritual health. Majority of the students reported close ties with God. From 20–120, the mean score of spiritual health in these students was 94.29 ($\pm$ 15.38). Students with higher spiritual health scores more frequently reported acceptable level of brushing, dental visit, and no smoking ($p < 0.01$). This indicates the significance of spiritual health in achieving healthy behaviors.

Introduction

Health behaviors have a pivotal role in prevention of chronic diseases. Improving health behaviors has been proposed for the improvement of an individual's future health course (Sagner et al., 2017). Studying healthy behaviors and understanding correlation between them will facilitate health promotion through behavior modification (Kim & Kim, 2020).

Spirituality is one of the less studied aspects of health (Dhar et al., 2013). The lack of spiritual health can lead to feelings of emptiness, futility, mental instability, mental problems and physical and social complications (Jaberi et al., 2019) which in turn influence an individual's health behavior. Relationship between spirituality and health behaviors has been documented (Božek et al., 2020; Clark et al., 2018). In his proposed theoretical framework, Hodge (Hodge, 2000), suggested that spiritual traditions tend to encourage health related behaviors. Moreover, in an effort to pour light to the relationship between spirituality and health behavior, Božek et al. (Božek et al., 2020) developed a theoretical model and verified it using path analysis. They found a significant relationship between spirituality and health behaviors among a group of Polish students.

Adolescent health is among the most important health issues worldwide considering that the adult lifestyle is established in adolescence and that adolescents constitute about 16% of the world's population (Singh et al., 2019). Association between different aspects of health including spiritual health have been widely studied among adolescents (Dankulincova Veselska et al., 2018; Hardy et al., 2019; Michaelson et al., 2019) reflecting that spirituality may have protective impacts from unhealthy behaviors and positively correlates with life satisfaction in this age group.

Adolescents with higher spiritual health scores presented better general health status (Jirásek et al., 2021) and lower probability of negative health outcomes (Dankulincova Veselska et al., 2018). Evidence on the correlation between spiritual health and oral health, however, is rare. The aim of this study was, therefore, to investigate the level of spiritual health and its relationship with oral health related behaviors in adolescent students in Iran. Considering the limitation of a cross-sectional study for establishment of a cause-and-effect relationship, we hypothesized that those adolescents with higher scores of spiritual health enjoy better oral health behaviors.

Methods

The target population for the present study was junior high school students from three selected cities in the eastern Mazandaran province, Iran, who were selected by multi-stage random sampling. All public schools in the three selected cities and their subordinate villages were listed separately for each city. Then, three girls' schools and three boys' schools were randomly selected for each city. Considering that the ratio of city to village population was 2 to 1, for each city, two schools from the city and one school from the dependent village were selected. Since there were at least two classes in each school for each grade, one class has been selected randomly and all students were given a questionnaire.

With respect to effect size = 0.04, power = 0.8 and $\alpha = 0.05$, the sample size was calculated as 382 individuals. After considering a design effect = 1.5 for cluster sampling method, the number of needed subjects increased to 573. This figure was divided between 6 groups of girls and boys and across three educational grades in each city. Samples were randomly selected from these three educational grades in each of three selected cities and among public schools. In cases where the selected samples did not cover all students in one class, the questionnaire was provided to all students in that class to avoid a feeling of discrimination among the students. Finally, 923 students completed and returned questionnaires to be used for the further analysis.

Prior to the implementation, consent was obtained from the students' parents. In each class, the purpose of the study was explained to the students by one the authors (RK) and then the questionnaires were distributed among the students. They were asked to answer the questions carefully and return it. Further explanation has been provided by RK in case of any question regarding the content of the questionnaire.

The questionnaire included background characteristics of the respondents (age, gender, living in urban or rural areas), questions related to oral health-related behaviors (frequency of brushing, flossing, eating sugary snacks, smoking, and visiting a dentist), and spiritual health (level of agreement with twenty phrases based on the six point Likert scale). The 20-item questionnaire (Paloutzian & Ellison, 1982) was used to assess spiritual health. The reliability and validity of this questionnaire has been confirmed in a previous study (Abhari et al., 2018) on the Iranian adolescents. The answers to the questions were in the form of a 6-point Likert scale from 1 (completely disagree) to 6 (completely agree). The sum of the scores indicated each student's level of spiritual health with a theoretical range of 20–120. For further analysis, quartiles of the possible scores (20–120) were calculated ($Q1 = 20-45$, $Q2 = 46-70$, $Q3 = 71-95$, $Q4 = 96-120$) and students were subdivided into four groups based on their spiritual health scores. Oral health-related behaviors were compared between two groups of students whose spiritual health scores were in the upper ($Q4$) and lower ($Q2$ & $Q3$) quartiles.

Descriptive statistics included frequency and percent of the adolescents belonging to each category. The Chi-square test served as statistical evaluation to assess differences in frequencies. To evaluate the factors related to the adolescents' reported oral health behaviors, five similar multivariate logistic regression models were fitted to the data while the adolescents' gender, age, living in urban or rural areas, and spiritual health score served as covariates. The corresponding odds ratios (OR) and their 95%

confidence intervals (95% CI) were calculated. The goodness of fit of the models was assessed by the Hosmer-Lemeshow test.

Results

In total, data from 923 students were included in the study. The mean age of these students was 13.68 ± 0.96 years and half of them were boys.

Table 1 presents distribution of the students' agreement with each of the 20 statements in the spiritual health questionnaire. Majority of the students reported that they believe God loves them and care about them, feel fulfilled in close communication with God, and that relation with God keep them away from the sense of loneliness.

Boys more frequently than girls ($p < 0.05$) reported that they "feel life is a positive experience", "find satisfaction in private prayer with God", and "don't know who I am, where I came from, or where I'm going".

Adolescents from rural areas more frequently than those from urban areas ($p < 0.05$) reported that they "feel most fulfilled when in close communion with God", "believe that God is concerned about problems", "relation with God contributes to sense of well-being", and "get much personal strength and support from God".

Figure 1 presents percentages of the students' adherence to different oral health behavior. Toothbrushing at least 2/day by 20%, flossing at least 1/day by 15%, consuming a sweet snack at least 1/day by 70%, visiting a dentist in the past year by 39% and not smoking was reported by 95% of the participants. Toothbrushing and not smoking were more prevalent among girls than boys ($p < 0.001$).

The mean score of spiritual health in these students was $94.29 (\pm 15.38)$ (range 20–120). Percentages of the students belonging to each quartile of the spiritual health scores were as follows: Q1 = 1, Q2 = 7, Q3 = 39, and Q4 = 53.

Figure 2 shows the correlation between the students' oral health behaviors and their spiritual health scores. Those students in the upper quartile of the spiritual health scores (Q4) reported brushing at least 2/day, visiting a dentist in the past year, and no smoking more prevalently than students in the lower quartiles of the spiritual health scores (Q2 & Q3) ($p < 0.01$).

Table 2 shows the results of five logistic regression models explaining factors related to the adolescents' reported oral health behaviors. In four out of the five models, higher scores of spiritual health augmented the likelihood of being in the category of acceptable oral health behavior. The likelihood of brushing teeth at least twice per day and not smoking was higher for girls (OR = 2.87 and 4.25) than boys.

Discussion

Belief in God, good feeling in relation with God, and finding the life as a meaningful phenomenon were reported by the majority of these adolescent students. Adhering to acceptable level of various oral health behaviors was not akin among the studied adolescents; while using dental floss and toothbrushing were reported by about one out of five, limiting the use of sugary snacks to one time per day and not smoking were highly prevalent. For three out of five behaviors, acceptable level of oral health behavior was more prevalent among students with higher scores of spiritual health which partly support our hypothesis.

A good connection with God which is reported by the majority of the present adolescents reflects their strong religious/spiritual basis and is expected to protect them from risky behaviors(Hardy et al., 2019). In line with the findings of this study, belief in God and a positive perception about God have been reported by adolescents in other studies(Michaelson et al., 2016; Pearce et al., 2017). Mean spiritual health score of the adolescents in the present study (94.29) is comparable with the findings of recent studies like Rezazadeh(Rezazadeh et al., 2015) et al. (87.6), Mirghafourvand(Mirghafourvand et al., 2016) et al. (90.2), and Ahmadpoori and Motaghi(Ahmadpoori & MOTAGHI, 2020) (95.5).

Adherence to optimal level of oral health behaviors facilitates good level of oral health status which in turn impacts different aspects of each individuals' life. Adolescents' oral health affects their quality of life(Paula et al., 2017) and academic performance(Ruff et al., 2019). Frequency of not smoking among the present adolescents was high (93% in boys and 98% in girls) and is in accordance with the findings of previous studies on adolescents in Iran: 93–95% of boys and 96–98% of girls(Kelishadi et al., 2013; Yazdani et al., 2008). Restricting sweet snacking to once per day that was reported by about 70% of the present adolescents is promising. This behavior was reported by < 60% of 12-year-old adolescents in another study from Iran(Rad et al., 2015). Twice per day toothbrushing was rare among the adolescents in this study (< 20%) despite clear evidence regarding its effectiveness for management of dental caries(Kumar et al., 2016). This figure is, however, comparable to the findings of other studies on adolescents in Iran; about 20% in a group of adolescents in Isfahan(Asgari & Amiri, 2019) and Saveh(Karimy et al., 2020).

Studies have shown that adolescents benefit from spiritual health as a protective factor against risky behaviors like drug and alcohol use(Brooks et al., 2018; Hatala et al., 2021). Such a pattern seems to exist in the present study since those adolescents with higher scores of spiritual health more prevalently reported acceptable level of toothbrushing, dental visit, and not smoking even with the control of confounding factors like gender, age, and living location. Such a linkage should not, however, regarded as a causal relationship due to the limitation of cross-sectional nature of the present study.

Conclusion

The frequency of brushing, flossing, and regular dental visits was very low in the studied students, which requires more emphasis on the impact of these behaviors on oral health. Higher prevalence of oral health-related behaviors in students with higher spiritual health scores indicates the significance of spiritual health in achieving healthy behaviors.

Declarations

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Authors' contributions: HG contributed to the whole project from conception the idea, writing the proposal, analyzing data, and writing the manuscript. MN mainly contributed to the statistical analysis, critical appraisal and related revisions. RK mainly contributed to the implementation phase and writing preliminary reports, and SB contributed to the concept development, the critical appraisal and related revisions of the manuscript.

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Tables

Table 1

Percentages of the students' (n = 923) agreement¹ with the statements in spiritual health questionnaire based on their gender and living place.

Item	Total	Boy	Girl	Urban	Rural
I believe that God loves me and cares about me.	91	91	91	90	93
I feel most fulfilled when I'm in close communion with God.	90	89	90	88	94
My relationship with God helps me not to feel lonely.	89	88	90	88	91
I believe that God is concerned about my problems.	87	88	87	85	92
My relation with God contributes to my sense of well-being.	86	84	88	84	91
I feel a sense of well-being about the direction my life is headed in.	86	86	86	86	86
I feel good about my future.	86	84	88	85	88
I believe there is some real purpose for my life.	84	84	84	83	86
I feel that life is a positive experience.	80	85	75	79	83
I feel very fulfilled and satisfied with life.	76	76	76	76	77
I don't find much satisfaction in private prayer with God.	74	69	78	75	72
I have a personally meaningful relationship with God.	74	71	76	72	77
I feel unsettled about my future.	27	26	28	27	25
I feel that life is full of conflict and unhappiness.	27	27	26	26	27
I don't know who I am, where I came from, or where I'm going.	24	28	20	25	23
I don't enjoy much about life.	21	19	22	21	20
Life doesn't have much meaning.	20	20	20	21	18
I don't have a personally satisfying relationship with God.	19	19	19	20	16
I don't get much personal strength and support from my God.	12	13	11	14	9
I believe that God has no role in my life.	11	15	6	11	9
1. Those who choose each of these options: relatively agree, agree, completely agree from the six point Likert scale (completely disagree to completely agree). 2. Bold figure indicates statistically significant difference ($p < 0.05$).					

Table 2

Determinants of oral health behaviors among the adolescents (n = 923) as assessed by five similar binary logistic regression models.

	E.S.	s.e.	OR	p-value	CI 95%
At least 2/day toothbrushing (0 = no, 1 = yes)					
Gender (0 = male, 1 = female)	1.05	0.17	2.87	< 0.001	2.03–4.06
Age (years)	-0.02	0.09	0.97	0.78	0.8–1.1
Location (0 = urban, 1 = rural)	0.09	0.18	1.09	0.61	0.7–1.5
Spiritual health score	0.01	0.00	1.01	0.003	1.00–1.03
Constant and goodness of fit ¹ (P)	-3.45	1.48		0.35	
At least 1/day dental flossing (0 = no, 1 = yes)					
Gender (0 = male, 1 = female)	0.28	0.18	1.33	0.13	0.9–1.9
Age (years)	-0.19	0.09	0.82	0.05	0.6–1.0
Location (0 = urban, 1 = rural)	-0.11	0.19	0.89	0.56	0.6–1.3
Spiritual health score	0.01	0.00	1.01	0.04	1.00–1.02
Constant and goodness of fit ¹ (P)	-0.56	1.60		0.62	
At least 1/day sweet snacking (0 = no, 1 = yes)					
Gender (0 = male, 1 = female)	-0.11	0.14	0.89	0.42	0.6–1.1
Age (years)	-0.02	0.07	0.98	0.79	0.8–1.1
Location (0 = urban, 1 = rural)	-1.09	0.15	0.89	0.48	0.6–1.2
Spiritual health score	0.006	0.005	1.006	0.21	0.99–1.02
Constant and goodness of fit ¹ (P)	0.71	1.21		0.42	
Dental check-up in the last year (0 = no, 1 = yes)					
Gender (0 = male, 1 = female)	0.05	0.13	1.0	0.68	0.8–1.3
Age (years)	-0.30	0.07	0.7	< 0.001	0.6–0.8
Location (0 = urban, 1 = rural)	-0.17	0.14	0.8	0.23	0.6–1.1
Spiritual health score	0.01	0.005	1.01	0.01	1.00–1.02
Constant and goodness of fit ¹ (P)	2.71	1.16		0.63	
Not smoking (0 = no, 1 = yes)					

	E.S.	s.e.	OR	p-value	CI 95%
Gender (0 = male, 1 = female)	1.45	0.40	4.25	< 0.001	1.9–9.3
Age (years)	-0.01	0.16	0.98	0.21	0.7–1.3
Location (0 = urban, 1 = rural)	0.21	0.35	1.23	0.54	0.6–2.4
Spiritual health score	0.06	0.009	1.06	< 0.001	1.04–1.08
Constant and goodness of fit ¹ (P)	-2.53	2.55		0.24	
1.By the Hosmer-Lemeshow test.					

Figures

Figure 1

Percentages of students complying with various oral health behaviors, according to their gender (* denotes significant statistical difference).

Figure 2

Percentages of the students complying with various oral health behaviors, according to their spiritual health scores (* denotes significant statistical difference).