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# Is religiosity related to periodontal health among the adult Jewish population in Jerusalem?

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*Background and Objective:* Religiosity may be a relevant protective factor for periodontitis, as it is for other chronic systemic diseases. The objective of the present study was to assess the relationship between periodontitis and religiosity, and whether oral health-related behaviours, spirituality and social support are included in the potential pathways that explain the association between religiosity and periodontitis.

*Material and Methods:* Cross-sectional data were part of a retrospective study. The stratified random-sampling technique was limited to the Jerusalem Jewish population. Conceptual hierarchical data analysis modelling was adopted, assuming that socio-economic position was the most distal determinant, age and gender were confounders, and social support, spirituality and oral health behaviours were mediators in the relationship between religiosity and periodontitis.

*Results:* Kappa intra-examiner values (0.89) were satisfactory. Response rate was 88.0%. The final sample included 123 men and 125 women. The mean age was 38.6 years (SD 3.25 years), with 33.9% declared to be 'orthodox', 33.1% 'religious' and 33.1% 'secular'. Higher levels of religiosity (p = 0.01), support of internal life through spirituality (p = 0.03), higher family social support (p = 0.02) and low levels of plaque (p = 0.05) were related to lower levels of periodontitis. Religiosity led to higher family social support of internal life through spirituality, which was related to plaque level and periodontitis.

*Conclusion:* Religiosity had a protective effect against periodontitis through extrinsic and intrinsic pathways. This should be considered as part of aetiology and prognosis, in potential prevention and care of periodontitis.

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Periodontists should seriously consider psychological effects in the aetiology, diagnosis and prognosis of periodontal diseases. The aetiology and treatment of gingivitis is simple and well established, while the aetiology of periodontitis is complex and needs further elucidation. Several risk and protective factors have been considered to explain the occurrence of periodontitis (1). These have included biological factors, such as host susceptibility (2), behavioural factors, such as accumulation of bacterial plaque (3,4) and tobacco smoking (5), systemic diseases, such as diabetes (6), socio-economic indicators and sociopsychological factors (1,7).

Most research on the association between periodontitis and sociopsychological factors has focused on risk rather than protective factors; however, it has been suggested that protective factors, such as coping, are more important than risk factors, such as stress (8). The few protective factors which have been identified include marital quality (9), positive life events (10), social support (11) and good coping skills (7,12).

Religiosity may be a relevant protective factor for periodontitis, as it is for other chronic systemic diseases. A systematic review of the medical literature reported that religiosity/spirituality was negatively associated with cardiovascular mortality in healthy population studies, and demonstrated a favourable effect on survival, although the presence of publication biases indicates that results should be interpreted with caution (13).

In the plausible protective effect of religiosity on periodontitis, the most obvious mechanism would be the behaviour pathway. Most positive health behaviours, including oral hygiene, are also religious behaviours (14,15). Moreover, it is also likely that religiosity acts as a coping aid in stressful situations, providing another pathway to explain this potential association. Religiosity and spirituality assist in coping with stress from life events, therefore reducing host susceptibility. Furthermore, religious affiliation provides adherence with a stronger social network and support from others, which may lead both to better oral health behaviours and additional external resources for managing stress.

Religiosity and spirituality have been recognized, in the social sciences, as two separate constructs (16). Spirituality can be defined as helping to understand and finding purpose and meaning to life (16). Therefore, religiosity may have extrinsic (e.g. practical observance of religious doctrines, including healthy behaviours) and intrinsic aspects (e.g. coping aid through spiritual beliefs and positive feelings), which may be part of a causal chain leading to periodontal health. Religion can, but does not always, serve as a channel towards the expression of spirituality (16).

Numerous studies have explored the complexity of the conceptual measurement of human religiosity. There is agreement that the concept includes multiple dimensions, that most dimensions of religiosity are correlated, and that measures of religiosity should distinguish its broadest dimensions, namely religious doctrine, religious practice and spirituality (17–21). An individual can follow a doctrine and never attend a church or belong to an organized religion. Others can deny all doctrines associated with organized religions, not be affiliated with an organized religion or attend religious services, but be strongly committed to a higher power and spiritual development.

The Jewish population of Israel, optimally represented in Jerusalem, provides a good case study to elucidate the relationship between periodontitis and religiosity. This population is divided into three distinctive groups based on their religiosity. The 'orthodox' community is isolated from the larger social structure by neighbourhood locality, a nongovernmental education system, a unique dress code and minimal exposure to the regular media. Their family cell is unique and different to the norm. They have tight familial and community ties and high levels of social support and mutual assistance. The nonorthodox 'religious' groups follow a comprehensive religious orientation with a significant impact on daily activities, but are not fundamentalists or isolated from the rest of the population. The third portion defines itself as 'secular' and observes minimal Jewish religious traditions.

The medical physician's 'charter', from a Jewish ethical viewpoint, is based on the cardinal principles of the supremacy of human welfare, patient autonomy and social welfare (22). Religious Jewish people generally follow a healthier dietary regime, consuming less meat, dairy products and coffee, and much more fish (23). They have lower smoking rates, lower levels of stress, and the healthier dietary regime is consistent with the previously shown longer life expectancy of religious people (23). In addition, synagogue prayer attendance tends to promote health and reduce mortality, mainly due to communal interaction and reflection of communal spirituality (24,25).

The objective of the present study was to assess the relationship between periodontitis and religiosity, and whether oral health-related behaviours, spirituality and social support are included in the potential pathways that explain the association between religiosity and periodontitis.

#### Material and methods

This cross-sectional study was conducted between December 2008 and July 2009 in Jerusalem, the largest Israeli city, both geographically and in population. The protocol of this study was approved by the Hadassah Hospital human ethics ('Helsinki') Institutional Review Board committee.

A sample size of at least 246 participants, equally distributed in three groups (n = 82), provided 80% statistical power to identify a difference of 15% in the proportion of participants with periodontal pockets of 6 mm or more between religious strata. The calculation assumed that 10% of the population have periodontal pockets of 6 mm of more,  $\alpha = 0.05$  and  $\beta = 0.10$  (26).

The sample was selected using a stratified random-sampling technique and was limited to the Jewish population. Self-definition determined membership in each stratum. The sample included married adult Jewish people aged 35–44 years living in Jerusalem. Selection procedures were described in a previous publication (27).

Data were collected through a questionnaire and a clinical examination. Sociodemographic information included gender, age (in years), education level, employment status and home density. Behavioural data included tooth brushing, use of oral hygiene aids and tobacco smoking status. Level of spirituality was estimated by the validated Hebrew version of the spiritual and religious attitudes in dealing with illness (SpREUK) questionnaire for religiosity, spirituality and health (28,29). Social support was assessed by the validated Multidimensional Scale of Perceived Social Support (MSPSS; 30,31).

Clinical examinations assessed plaque levels, dental status and periodontal health. Oral hygiene was assessed according to the plaque index (32). Dental status (Decayed, Missing, and Filled Teeth; DMFT) and periodontal status (Community Periodontal Index; CPI) were assessed using the WHO criteria (33). Periodontitis was operationally defined as having at least one periodontal pocket depth of 6 mm or more (CPI score = 4).

All clinical examinations were carried out by one trained dentist (A.Z.) with the aid of a plane mouth mirror and a WHO CPI probe in natural light. Participants were examined in their homes, seated on a standard chair. Radiography was not applied. Duplicate examinations were carried out among 22 participants to assess intra-examiner agreement within a 2 wk interval.

#### Analysis of data

Data were analysed using the STATA 9.0 (StataCorp LP, College Station, TX, USA) package, which allows controlling for the potential dependence among married couples clustering. Data entry and manipulation of sociodemographic and behavioural data were reported elsewhere (27). Religiosity was measured by self-definition of participants and type of schools that their children attended (secular, religious nonorthodox or religious orthodox schools). Participants reporting discrepant answers were excluded from the analysis. Participants were then categorized as 'orthodox', 'religious' or 'secular'. The SpREUK 1.1 process (28) was adopted to assess spirituality. It included the following domains: search for meaningful support; trust in divine guidance; positive interpretation of disease; support of external life through spirituality; and support of internal life through spirituality. The questionnaire consists of 29 items using a five-point Likert scale. For each of the five subscales, scores were summed and then dichotomized according to the median into 'low' or 'high'. Self-perceived social support (MSPSS) included three domains: family, friends and significant others. The questionnaire consists of four items in each domain; a total of 12 items, using a seven-point Likert scale (30,31). Scores for each of the three subscales were totalled separately and dichotomized according to the median, as 'low' or 'high' social support.

The first step was to carry out a multiple logistic regression, forcing socioeconomic indicators into the equation to identify the best indicator adjusted by age and gender. A similar approach was used to identify the best indicator of oral hygiene. Following this step, the associations between each explanatory variable and periodontitis were assessed. All variables that had reached statistical significance at the 20% level were included in the conceptual modelling. Data analysis accounted for clustering of individuals within families.

A conceptual hierarchical data analysis modelling from distal to proximal determinants of periodontitis was adopted (34). This well-established approach employs sequential adjustments from distal to proximal determinants of a health condition, with the aim of elucidating their relationships. Conceptual analysis, contrary to statistical decisions on significant determinants of diseases, adopts a theoretical ordering. The ordering of variables is conceptually determined in accordance with the hypothesis. Our hypothesis was that religiosity is associated with periodontitis through extrinsic (e.g. social support) and intrinsic sociopsychological pathways (e.g. spirituality), influencing oral health behaviour and ultimately leading to periodontal status outcome. Conceptual hierarchical data analysis modelling accounted for variation due to confounding effects and variation due to effect modification. This data analysis tested for interactions between religiosity and education level, age and gender, but not for mediators as these were part of the conceptual model. Our conceptual modelling assumed that socio-economic position (SEP) was the most distal determinant, age and sex were confounders, and social support, spirituality and oral health behaviours were mediators in the relationship between religiosity and periodontitis.

# Results

A total of 288 parents were invited to participate, 254 adults agreed to be examined and to answer the questionnaires. Six participants were excluded from further analysis because they did not provide reliable answers to define their religiosity. The final sample included 248 individuals. Therefore, the response rate was 88%. Intraexaminer agreement was satisfactory, and all Kappa values were above 0.89. The minimal sample size had been calculated to be 246.

The final sample comprised 123 (49.6%) men and 125 (50.4%) women. The mean age was 38.6 years (SD 3.25 years), with 33.9% declared to be 'orthodox', 33.1% 'religious' and 33.1% 'secular' Jewish. The prevalence of periodontitis was relatively high in this sample (14.5%).

Frequency distributions of clinical and nonclinical measures are presented in Table 1. Results of this univariable analysis showed that the presence of moderate to abundant plaque levels and tobacco smoking were risk factors for periodontitis, and higher levels of education and social support from family were protective factors. In addition, data analysis showed that religious affiliation and domains of spirituality, namely search for meaningful support, positive interpretation of disease and support of internal life through spirituality, were significantly (p < 0.05) associated with periodontitis. A clear gradient in periodontitis was observed from higher to lower levels of periodontitis among secular, religious and orthodox Jewish (29.3, 8.5 and 6.0%, respectively; p < 0.01). Likewise, participants with higher levels of spirituality were less likely to experience periodontitis, as follows: search for meaningful support (7.8 and 20.3%, respectively; p < 0.01); trust in higher guidance (8.9 vs. 18.4%, respectively; p = 0.04); positive interpretation of disease (9.7 vs. 18.5%, respectively; p < 0.05); and higher support of internal life through spirituality (indicative of a trend; 8.2 and 17.1%, respectively; p = 0.06).

Further data analysis used multiple logistic regression, adjusting results by age and gender. The first model forced SEP indicators into the equation. Findings of univariable analysis had identified level of education (p = 0.02) as the best socio-economic indicator. Likewise, in multiple logistic regression forcing oral hygiene indicators, level of plaque had been identified as the best

Table 1.	Frequency	distribution	and odds ra	tios of soc	iodemographic	, oral health	behaviour as	nd sociopsyc	chological 1	measures of	n presence of
periodon	tal pocket	depth 6 mm	or more in	248 adults							

		No periodontal pockets ≥	Periodontal pockets	Crude	
		6 mm	$\geq 6 \text{ mm}$	odds ratio	<i>p</i> -Value
Education	Low	83 (79.8)	21 (20.2)	1.00	0.02
	Academic	94 (88.7)	12 (11.3)	0.51 (0.23; 1.13)	
	High Yeshiva	35 (92.1)	3 (7.9)	0.21 (0.06; 0.79)	
Employment status	Employed	153 (82.7)	32 (17.3)	1.00	0.06
	Unemployed	59 (93.7)	4 (6.3)	0.35 (0.12; 1.06)	
Home density	Low	112 (89.6)	13 (10.4)	1.00	0.05
	High	100 (81.3)	23 (18.7)	2.10 (0.99; 4.34)	
Dentist attendance	Once per year or more	127 (86.4)	20 (13.6)	1.00	0.52
	Less than once per year	85 (84.2)	16 (15.8)	1.28 (0.61; 2.70)	
Oral hygienist attendance	Once per year or more	84 (82.4)	18 (17.6)	1.00	0.25
	Less than once per year	128 (87.7)	18 (12.3)	0.65 (0.31; 1.35)	
Frequency of tooth brushing	Less than once per day	22 (91.7)	2 (8.3)	1.00	0.62
	Once per day	88 (83.8)	17 (16.2)	2.12 (0.44; 10.21)	
	Twice per day	101 (85.6)	17 (14.4)	1.96 (0.40; 9.53)	
Using tooth cleaning accessories	Yes	67 (89.3)	8 (10.7)	1.00	0.26
0	No	145 (83.8)	28 (16.2)	1.61(0.70; 3.70)	
Level of plaque	Absent or little	110 (93.2)	8 (6.8)	1.00	< 0.01
1 1	Moderate to abundant	102 (78.5)	28(21.5)	3.78 (1.65; 8.66)	
Smoking	Yes	41 (73.2)	15 (26.8)	1.00	< 0.01
C	No	171 (89.1)	21 (10.9)	0.34 (0.16; 0.71)	
Religion sector	Less religious	58 (70.7)	24 (29.3)	1.00	< 0.01
C	Religious	75 (91.5)	7 (8.5)	0.21 (0.08; 0.53)	
	Orthodox	79 (94.0)	5 (6.0)	0.15 (0.05; 0.44)	
SPR: search for	Low	106 (79.7)	27 (20.3)	1.00	< 0.01
meaningful support	High	106 (92.2)	9 (7.8)	0.33 (0.15; 0.74)	
SPR: trust in higher	Low	120 (81.6)	27 (18.4)	1.00	0.04
guidance	High	92 (91.1)	9 (8.9)	0.43 (0.19: 0.97)	
SPR: positive interpretation	Low	110 (81.5)	25 (18.5)	1.00	0.05
of disease	High	102 (90.3)	11 (9.7)	0.47 (0.22; 1.00)	
SPR: support of external life	Low	125 (83.3)	25 (16.7)	1.00	0.24
through spirituality	High	87 (88.8)	11 (11.2)	0.63 (0.26; 1.35)	
SPR: support of internal life	Low	145 (82.9)	30 (17.1)	1.00	0.06
through spirituality	High	67 (91.8)	6 (8.2)	0.43 (0.17; 1.06)	
Social support: significant others	Low	115 (85.2)	20 (14.8)	1.00	0.88
11 5	High	97 (85.8)	16 (14.2)	0.95 (0.47; 1.92)	
Social support: family	Low	139 (83.2)	28 (16.8)	1.00	0.04
	High	73 (90.1)	8 (9.9)	0.48 (0.25; 0.99)	
Social support: friends	Low	42 (82.4)	9 (17.6)	1.00	0.48
	High	170 (86.3)	27 (13.7)	1.35 (0.59: 3.12)	
Total	0	212 (85.5)	36 (14.5)		

SPR, spirituality.

predictor (p < 0.01). Therefore, the following explanatory variables (all at a minimal level of p < 0.20) were included in the conceptual modelling: level of education (p = 0.02), level of plaque (p < 0.01), tobacco smoking (p < 0.01), search for meaningful support (p < 0.01), trust in higher guidance (p = 0.04), positive interpretation of disease (p < 0.05), social support by family (p = 0.04) and support of internal life through spirituality (p = 0.06).

The results (Table 2) of the conceptual hierarchical data analysis modelling using multiple logistic regression statistical test of explanatory variables on periodontitis, after Bonferroni correction, confirmed that higher levels of religiosity (p = 0.01), support of internal life through spirituality (p = 0.03), higher family social support (p = 0.02) and low levels of plaque (p = 0.05) were statistically significantly related to lower levels of periodontitis.

Data analysis also tested pathways (Fig. 1) to explain the relationship between religiosity and periodontitis. Results showed that plaque level was a mediator of the highly significant relationship between religiosity and periodontal status reported. Higher levels of religiosity were related to higher levels of support of internal life through spirituality and social support, which were related to plaque levels, which in turn were a strong determinant of periodontitis. High level of support of internal life through spirituality (p < 0.01) and social support (p = 0.04) were also significantly related to lower levels of periodontitis. Furthermore, there was a significant reduction in the odds ratio of religios-

in Jerusalem	) -	)		~	,	) )		, ,	4	,	
		First model <sup>a</sup>		Seconnd nodel <sup>b</sup>		Third model <sup>c</sup>		Fourth model <sup>d</sup>		Fifth model <sup>e</sup>	
Severe periodontitis (CPI 4	(1	OR (95% CI <sup>a</sup> ) <sub>1</sub>	o-Value	<b>JR</b> (95% CI <sup>a</sup> )	<i>p</i> -Value	OR (95% CI <sup>a</sup> )	<i>p</i> -Value	OR (95% CI <sup>a</sup> )	<i>p</i> -Value	OR (95% CI <sup>a</sup> )	<i>p</i> -Value
Education	Low Academic or high Yeshiva	1.00 0.42 (0.22; 0.76) (	0.005	1.00 0.52 (0.26; 1.03)	0.060	1.00 0.48 $(0.23; 0.98)$	$^{-}$ 0.044	1.00 0.57 (0.30; 1.11)	- 0.097	1.00 0.53 (0.27; 1.04)	_ 0.063
Self-definition of religiosity	Less religious Religious Orthodox			1.00 0.18 (0.05; 0.64) 0.15 (0.04; 0.56)	$^{-}_{0.005}$	1.00 0.21 (0.07; 0.65) 0.17 (0.05; 0.55)	$\stackrel{-}{0.007}$	1.00 0.24 (0.09; 0.67) 0.19 (0.06; 0.56)	- 0.006 0.003	1.0 0.33 (0.09; 1.13) 0.20 (0.05; 0.71)	-0.080 0.013
Social support - family	Low High					1.00 0.28 (0.11; 070)	- 0.007	1.00 0.38 (0.18; 0.81)	- 0.012	1.00 0.41 (0.18; 0.70)	-0.029
SPR: search for	Low							1.00	I	1.00	Ι
Meaningful support	High							0.83 (0.29; 2.36)	0.732	0.87 (0.26; 2.98)	0.827
SPR: trustin higher	Low							1.00	- 0000	1.00	
Guidance SPR · nositive	Low							0.48 (0.12; 1.80) 1 00	0.289	0.57 (0.15; 2.24) 1 00	0.422
Interpretation of disease	High							0.60 (0.15; 2.40)	0.472	0.51 (0.13; 2.047)	0.341
SPR: support of internal	Low							1.00	I	1.00	Ι
Life through spirituality	High							0.33 (0.12; 0.92)	0.035	0.31 (0.10; 0.89)	0.030
Level of plaque	Absent or little									1.00	Ι
	Moderate or abundant									2.64 (1.01; 6.89)	0.047
Smoking	Yes									1.00	I
	No									0.96 (0.33; 2.78)	0.942
Abbreviations: CPI, comm <sup>a</sup> First model: age and gen <sup>b</sup> Second model: add religi <sup>c</sup> Third model: add spiritus <sup>d</sup> Fourth model: add behavio	unity periodontal index der. osity to the model in ad ality (four SPR variable: I support from family to oural variables to social	; CI, confidence inter dition to age and ge s) to the model in ac o spirituality (four SI support from family	rval; OR, nder. ldition to PR variabl , spirituali	odds ratio; SEP, religiosity, age an es), religiosity, ag ty (four SPR var	socio-econ id gender. ge and gen iables), rel	omic position; SF der. igiosity, age and	PR, spiritu gender.	ality.			

Table 2. Results of conceptual multiple logistic regressions for having severe periodontitis (CPI 4) adjusted for age, gender and cluster sampling among a sample of 35- to 44-year-old Jewish adults

422



*Fig. 1.* A pathway model for intrinsic and extrinsic religiosity as a distal determinant influencing oral health behaviours and affecting periodontal health outcome.

ity on periodontitis after adjusting for spirituality, social support and plaque level (Table 2). The relationship between religiosity and periodontal status remained statistically significant after adjusting for relevant variables, suggesting that there are other unknown mediators to explain this association further. Finally, the results were not significantly influenced by effect modification as there were no significant interactions among variables tested, except for education and support of internal life through spirituality (p = 0.027).

## Discussion

Using a conceptual hierarchical approach in this study provided novel insights into the complex interrelationship between sociopsychological factors, here represented by religiosity, and periodontitis. We tested two pathways, which explained, in part, this association. Religiosity seems to lead to higher social support from family, a well-established determinant of periodontitis, and this was confirmed in the present study. Religiosity was also related to perception of support of internal life through spirituality, which was related to plaque level and periodontitis. Thus, it is plausible that religiosity is a protective factor against periodontitis.

Additionally, the relationship between religiosity and periodontal status remained statistically significant after adjusting for behavioural mediators (Table 2). Therefore, it is likely that, as with other chronic diseases, social support from family and support of internal life through spirituality may affect periodontal status through a biological pathway. Psychosocial factors lead to changes in the oral habitat and biological responses of the host (35). As for other chronic diseases, the pathophysiological mechanism is probably via allostasis, the ability to adapt successfully to changing environments, such as chronic stressful circumstances. The allostatic concept conveys that if challenges are beyond the normal ranges of adaptive responses, wear and tear on regulatory systems occurs and allostatic load accumulates (36). Deregulation occurs across multiple regulatory systems, affects immune competence (37) and is manifested in many health outcomes (36). Increased coping reduces the harmful effect of chronic stress, leading to better host response. Further research should test the biological pathway, because the behavioural pathway seems well demonstrated.

Religiosity also seems to have influenced the relationship between education level and periodontitis. The odds ratio of education level on periodontitis was gradually reduced in the sequential adjustments, and was not significantly associated with periodontitis after full adjustment. It is well known that orthodox Jewish people in Jerusalem are not wealthy, but despite their low socio-economic circumstances they had less periodontitis than their less religious or secular counterparts. It was interesting to note that participants with high Yeshiva education were also less likely to experience periodontitis than their counterparts who had attended university. The odds ratio of education level on periodontitis was gradually reduced in the sequential adjustments and was not (or remained) significantly associated with

periodontitis after full adjustment (Table 2). Orthodox communities are generally characterized by low socioeconomic levels and are not adequately (if at all) exposed to modern health attitudes and the mass media. Socioeconomic position (as reflected by education in this study) demonstrated a significant impact on periodontal status. Despite the lower SEP levels of the 'orthodox' group, they demonstrated better periodontal health than the secular group. The relationship between education and spirituality has been discussed in the literature (38), and this significant interaction should be examined. In the present study, after adjustment for education, the association between spirituality and severe periodontitis remained statistically significant.

This study was limited to the Jewish community living in Jerusalem, to whom these findings can be inferred. However, external validity of our findings was very good. A comparison of findings in relationship to the proportion of smokers in our sample (22.8%) and those reported at the national level among Israelis (23.3%) was remarkably similar (39). The findings of this study were consistent with other studies demonstrating that religiosity is related to general health (13).

The Jewish people are an ethnoreligious group, characterized by a wide diversity of religiosity, ranging from through extremely orthodox to secular (some of whom are even atheistic or agnostic). All these levels are represented in the present study, according to the established Israeli school education system and selfdefinition. Furthermore, comparing degrees of commitment within a single religion can be regarded as stronger than comparing different religions. This approach might elide differences in behavioural expectations of different religions.

It should be noted that religiosity in other populations may lead to different findings. However, it is interesting to note the clear gradient in periodontitis from less to more religious groups (secular, religious and orthodox) in the present study population. Further research should test this association in other places and for other religions. Finally, the research design adopted in this study was cross-sectional; therefore, causality cannot be assumed.

This paper addressed a gap in the literature highlighted in a recent review of literature on sociopsychological factors and periodontal health. The authors stated that '... the poor results, both in behavioural and in therapeutic interventions to improve periodontal health stem from a failure to fully develop a general etiologic model. The relative ineffectiveness of interventions stems from the failure to take psychosocial pathways into account' (1). Our findings provided further understanding of the association between psychosocial factors and periodontitis, in particular the health behaviour pathway strongly linked to periodontitis. The potential biological pathway through host biological resistance hypothesized in this article may explain further how psychological factors may affect the response of the periodontal tissues to pathogens. In conclusion, it is plausible that religiosity has a protective effect against periodontitis. Clinicians should consider the potential effect of sociopsychological factors on aetiology, prognosis and interventions in the prevention and treatment of periodontitis.

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