

Article

## Validity and Reliability of the Hebrew Version of the SpREUK Questionnaire for Religiosity, Spirituality and Health: An Application for Oral Diseases

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**Abstract:** *Background:* Research has examined the connection between religiosity, spirituality (SpR) and health, and the potential of these variables to prevent, heal and cope with disease. Research indicated that participation in religious meetings or services was associated with a lower risk of developing oral disease. We intended to test a Hebrew version of the SpREUK 1.1 questionnaire, which is reported to be a reliable and valid measure of distinctive issues of SpR, and to test its relevance in the context of oral illness among a Jewish population. *Methods:* In order to validate the SpREUK-Hebrew instrument, minor translational and cultural/religious adaptations were applied. Reliability and factor analyses were performed, using standard procedures, among 134 Jewish Israeli subjects (mean age 38.4 years). *Results:* Analysis of reliability for internal consistency demonstrated an intra-class correlation of Cronbach's alpha = 0.90 for the intrinsic religiosity/spiritual and the appraisal scales, and of 0.90 for the support through spirituality/religiosity scales. Inter reliability agreement by kappa ranged between 0.7 and 0.9. We were able to approve the previously described factorial structure, albeit with some unique characteristics in the Jewish population. Individuals' time spent on spiritual activity correlated with the SpREUK scales. The instrument discriminated well between religious subgroups (*i.e.*, ultra Orthodox, conventional religious and less-religious). Preliminary results

indicate an association between measures of spirituality and oral health. *Conclusions:* The traditional and cultural adaptation of the tool was found to be appropriate. SpREUK-Hebrew was reliable and valid among a Jewish population. This method could therefore be employed in comparative studies among different cultural and religious backgrounds.

**Keywords:** spirituality; religiosity; SpREUK questionnaire; coping with health; oral health

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## 1. Background

Spirituality has become a subject of interest in the research of health and health care. An increasing number of studies, commentaries and reviews have examined the association between spirituality and religiosity (SpR) and health, and their potential to prevent, heal or cope with disease [1-10]. Moreover, research has confirmed that spiritual well-being is positively associated with a "fighting-spirit" and with quality of life and negatively correlated with helplessness/hopelessness, anxious preoccupation, and cognitive avoidance [11]. Although some research has revealed that spirituality is associated with fatalism, spiritual well-being has generally been reported to offer a certain level of coping and protection against hopelessness and despair in terminally ill patients [12-16].

Although religiosity and spirituality have often been employed as similar and even interchangeable terms, these constructs may not be identical. It has been suggested to divide "religiosity" into three sub-constructs: Intrinsic, Extrinsic, and Quest Religiosity [17-20], while "spirituality" has been divided into the following sub-constructs: "Cognitive orientation towards spirituality", "Experiential/Phenomenological dimension of Spirituality", "Existential Well-Being", "Paranormal Beliefs", and "Religiousness" [21].

The measurability and operational ability of SpR remains a problem and thus several questionnaires have addressed this topic. Most of them measure beliefs of specific religious groups, and enquire about the relationship with a personal God [22-24], while only a few take into account that several patients may be offended by institutional religion, and may have an interest in secular forms of spirituality of a more personal search for fulfillment [25,26].

The SpREUK questionnaire (SpREUK is an acronym of the German translation of "Spiritual and Religious Attitudes in Dealing with Illness") was designed to examine attitudes of patients with life-threatening and chronic diseases towards SpR (in terms of reactive coping), and has been found to provide a reliable and valid measure of distinct topics of SpR that may be particularly useful for assessing the role of this subject in health related research [27-33]. The underlying concept refers to spirituality as a multi-dimensional construct which focuses on an "individual and open approach in the search for meaning and purpose in life, as a search for transcendental truth which may include a sense of connectedness with others, nature, and/or the divine". The basic manual of the instrument differentiates between: (1) "Search for meaningful support/access" (which represents patients' intention to have access to a SpR resource which may be beneficial to cope with affected health, and interest in SpR issues); (2) "Trust in a higher source" (which is a measure of intrinsic religiosity); and (3) "Positive interpretation of disease" (deals with a cognitive reappraisal because of illness and subsequent attempts to change aspects of life or behavior) [30,31].

Is the SpREUK questionnaire appropriate for all religious traditions? The majority of participants investigated so far were of the Christian denomination, Arab Muslims, and agnostics/atheists. Although the instrument avoids exclusive terms such as God, Jesus, church *etc.*, and thus was also found to be valid among atheistic/agnostic individuals [28-33], it is unclear whether or not it is suited to be used in a Hebrew speaking Jewish population with its different terminologies, attitudes and religious demands. When adapting this instrument for other religions and faiths, the tool needs to be adjusted via parallel and similar terms with the same broad spiritual meanings but avoiding any connotations that may be "alien" to the specific faith and remain within the general reference of items, subscales and definitions.

Epidemiological inequalities in oral health have been related to variance in ethnicity and religiosity. Studies have found differences in caries prevalence among different religious groups [34-36]. Differences were revealed not only in clinical findings but also in oral health behavior [37]. Research has also indicated that participation in religious meetings or services was associated with a lower risk of developing oral disease [38,39]. Our intention was thus to apply the SpREUK in a Jewish population with its strict religious demands and regulations. We report the translation and validation of a Hebrew version of the SpREUK 1.1 questionnaire, as applied among a Jewish population in Jerusalem, Israel, with an implication on oral diseases.

## 2. Methods

### 2.1. Procedure and subjects

Ethical approval of the Hadassah-IRB was acquired. In addition, among the Orthodox Jewish community informed agreement of relevant Rabbis is demanded for most external interventions and this was therefore also ascertained. All individuals were informed of the purpose of the study, assured of confidentiality, and supplied with informed consent forms. The anonymous questionnaire was self-applied. The Hebrew speaking study population was derived from parents of children in different schools. Jewish schools in Jerusalem (as defined and controlled by the Municipality and Ministry of Education) are uniquely structured and characterized according to different "levels" of religiosity: "public secular", "public national religious" and "private (ultra) Orthodox". The municipal education system includes 115 junior high schools and is categorized according to three school strata: 40 secular, 32 religious, and 43 ultra-orthodox schools. Three schools were randomly selected from each stratum, making a total of nine schools. Within each cluster parents were randomly chosen. This sampling system, therefore, supplied the most practical method of identifying families' level of religiosity. Inclusion requirements included: parents aged 34–45, married and living together, without any chronic disease, children aged 12–13 years.

Level of education of the participants was categorized into "low education" (no education/elementary school/high school/low orthodox seminar), "Yeshiva education" (orthodox seminar from and above age 18), and "academic education" (university or college).

The population sample comprised of 134 subjects of whom 50% were women. The mean age was  $38.4 \pm 3.1$  years (range of 34–45). Among the respondents, 22 had filled in the entire questionnaire twice within a two week span, in order to test for reliability.

## 2.2. Measures

We intended to test a Hebrew version of the existing SpREUK questionnaire (SpREUK is an acronym of the German translation of "Spiritual and Religious Attitudes in Dealing with Illness"), developed to examine how patients with severe diseases view the impact of spirituality/religiosity on their health and how they cope with illness [27-33,40]. The SpREUK appeared to be a good choice for assessing a patient's interest in spiritual/religious concerns, without a potential bias for or against any specific religious commitment. The instrument was originally based on essential motifs identified in counseling interviews with chronic disease patients (*i.e.*, having trust/faith; searching for a transcendent source to rely on/keeping grounded; a "message" via the disease to change one's way of life), and avoids exclusive terms such as God, Jesus, church, *etc.* [28]. The 29-item instrument SpREUK 1.1, which was employed to develop the Hebrew version, has optimal psychometric properties (Cronbach's alpha of the main instrument with three factors = 0.91; alpha of the support item pool with two underlying factors = 0.95) [30]. Factor analysis approved the previously described structure with the following sub-scales [30]:

1. "Search for meaningful support/access" (SMS) (6 items);
2. "Positive interpretation of disease" (PID) (6 items);
3. "Trust in higher source" (THS) (3 items).

The support item pool was independent from the main item pool and differentiates

1. "Support in relations with the external life through spirituality/religiosity" (SEL) (10 items);
  2. "Support in the internal life through spirituality/religiosity" (SIL) (4 items).
- The factor "Search for meaningful support/access" represents patients' intention to have access to a SpR resource which may be beneficial to cope with affected health, and interest in SpR issues. It is strongly related ( $r > 0.5$ ) with the engagement frequency of existentialistic practices and spiritual (mind-body) practices [30,33,41].
  - "Trust in higher source" is a measure of intrinsic religiosity, which identifies religion as an end in itself. Characteristics of intrinsic religiosity are strong personal convictions, beliefs and values which matter. The scale correlated strongly with the engagement frequency of conventional religious practices [30,33,41].
  - In contrast, "Positive interpretation of disease" (it is possible to interpret illness as an opportunity, a pointer to change one's way of life, or to reflect upon what is essential in life) refers to an appraisal coping strategy in terms of life reflection. It was found to correlate moderately with an existentialistic insight practice [30,33], and strongly with "Search for meaningful support/access" and "Trust in higher source" [31,33], indicating a spiritual connotation. However, even patients without an explicit interest in institutional religiosity might interpret illness as an opportunity to change one's way of life, or to reflect upon what is essential in life.
  - The two factors "Support of life through spirituality/religiosity" addresses the beneficial effects of spirituality/religiosity with respect to external (*i.e.*, deeper connection with others and the world around, conscious management of life, *etc.*), and internal (*i.e.*, promotion of inner strength, feeling of inner peace, *etc.*) dimensions, and health-related issues (*i.e.*, better coping with illness, restoration of mental and physical health, *etc.*). Both factors were measured only in patients who

valued themselves as spiritual/religious (according to self-categorization). Both scales correlated strongly with frequency of engagement in conventional religious practices [30].

The internal consistency of SpREUK was found to be high, and reliability was approved by factor analyses [27-33]. Construct validity (convergent and divergent) was approved with respect to frequency of engagement in spiritual, religious and existentialist forms of practice, adaptive coping strategies, life satisfaction, and interpretation of illness [33].

Each participant was asked to score his/her level of agreement to the statement: *"Each person has their own and unique point of view which must not necessarily apply to yours. Thus, read the statements you will find here carefully and then indicate how true each is for you and your situation by circling one number per line"*. All items were scored on a 5-point "Likert" scale from disagreement to agreement (0: does not apply at all; 1: does not truly apply; 2: don't know; 3: applies quite a bit; 4: applies very much).

### 2.3. Translation and cultural/religious adaptations

Two independent bilingual Jewish religious translators, whose mother tongue was Hebrew, prepared the Hebrew version of the SpREUK questionnaire. The translators adjusted the items for the Judaic faith, compared both translations and reached a consensus. A back translation was then performed by a bilingual (English and Hebrew) translator, who was not aware of the original English version. The Hebrew version was compared with the original English version by the forward and backward translators to detect misinterpretations and nuances that might have been missed. The final version was assessed after only slight modifications made by consensus. The vast majority of the text was directly translated, but in minimal instances wording was not precisely translated, but adapted according to relevance and meaning. As examples: The item concerning "guardian angel" was excluded; "inner power" was modified as "internal-ness".

### 2.4. Statistical analysis

#### 2.4.1. Reliability

The SpREUK has two independent item pools, one describing spiritual/religious attitudes and convictions ("Search for meaningful support"; "Trust in higher source"; "Positive interpretation of disease"), and the other describing the "Support through spirituality/religiosity" with respect to life concerns. Reliability analyses were performed for both item pools of the SpREUK-Hebrew according to the following two statistical measures:

1. The internal consistency (contrast) estimates the correlation among the items in the questionnaire. Cronbach's alpha coefficient is the most common measure of internal consistency. A high coefficient ( $\geq 0.70$ ) suggests that the items measure the same construct and support the construct validity [42].
2. Test-retest reliability was calculated comparing results of questionnaires applied to the same 22 examinees within a two week interval. The inter reliability agreement was tested by kappa statistics of agreement for each item and for the intra class correlation coefficient for the total score. A high kappa value ( $\geq 0.70$ ) is considered to be acceptable for inter reliability agreement [43].

#### 2.4.2. Validity

Previous research with the SpREUK had assured construct validity [28-33]. To assess validity of the Hebrew version, we relied on the technique of factor analysis (extraction of main components with Eigenvalues  $> 1$ ), which examines the correlations among a set of variables in order to achieve a set of more general 'factors'. Factor analyses were repeated rotating different numbers of items (Varimax rotation with Kaiser Normalization) in order to arrive at a solution embodying both the simplest structure and the most coherent one.

It was assumed that the sum scores of the respective SpREUK-Hebrew factors should be significantly correlated with time dedicated to spiritual activity among the present Jewish population (according to "how many hours per day you spend on learning Torah, praying, or other spiritual activities"). In this analysis, Spearman's rho correlation coefficient was employed. A strong correlation is considered to be over 0.50, a moderate between 0.30–0.50, and a low correlation below 0.30 [44].

#### 2.5. Oral health

Clinical examinations for dental caries were carried out by one trained dentist with the aid of a plane mouth mirror and a Community Periodontal Index (CPI) probe, as recommended by the World Health Organization (WHO), in full natural light (Israel is characterized by a bright and sunny climate). Participants were seated in their homes on a regular chair. Radiography for caries detection was not applied. Dental caries experience was assessed using the Decay, Missing and Filled Teeth (DMFT) index following the WHO criteria [45], and dichotomized, as recommended by WHO, as high ( $>13.9$ ) or low ( $<13.9$ ). A clinical examination for periodontal status was assessed using the WHO Community Periodontal Index (CPI). This index scale is nominal and ordinal: 0 = health; 1 = bleeding; 2 = calculus; 3 = "shallow" periodontal pocket of 4–5 mm; 4 = "deep" periodontal pocket above 6 mm; 5 = excluded [47]. The mouth is divided into six "sextants" defined by tooth numbers: 18–14, 13–23, 24–28, 38–34, 33–43, and 44–48. A sextant is examined only if there are two or more teeth present and not indicated for extraction. Analyses calculated the average percentage of people with worst CPI scores (WCPI) by assigning for each person the worst of the six available CPI scores [46]. WCPI was operationally dichotomized as examinees with any sextant with shallow or deep periodontal pockets (CPI = 3 and 4)/without any sextant with deep periodontal pockets.

#### 2.6. Statistics

Data were presented as mean values  $\pm$  standard deviations or relative proportions (%). Descriptive analysis of the sample, reliability and factor analysis, as well as variance and correlation analyses, were performed with SPSS 15.0 for Windows (SPSS GmbH Software, Munich). We chose  $p < 0.05$  as the level of significance.

### 3. Results

#### 3.1. Reliability

Analysis of reliability by cross checking of internal consistency, demonstrated an intra-class correlation of Cronbach's alpha = 0.90 for the 15 items of the item pool 1 ("Search for meaningful support"; "Trust in higher source"; "Positive interpretation of disease"), and of alpha = 0.89 for the 14 items of item pool 2 ("Support through spirituality/religiosity"), both of which indicate a high level of reliability for the SpREUK-Hebrew (Table 1). The internal consistency for the SpREUK-Hebrew questionnaire revealed that the item "Support of the internal life refers to an inner power" (original item 5.4), had a poor corrected item-total correlation (0.08), and thus was eliminated in the final version. All other values were in the acceptable range of 0.32–0.81 (Table 1) above the accepted cut-off level of 0.30 for item-total correlations for retention of an item in the designated factor [44].

Inter reliability agreement was tested by kappa for each item and for the intra class correlation coefficient for the total score (Table 2). For all factors, kappa statistics ranged from 0.70–0.92.

#### 3.2. Validity

##### 3.2.1. Item pool 1

The 15-item main pool appeared to be suitable, demonstrating a Kaiser-Mayer-Olkin value of 0.88, which measures the degree of common variance. Barlett's test for non-sphericity was also significant ( $p < 0.001$ ).

Exploratory factor analysis revealed three factors which explained 62% of the variation in the Hebrew version of SpREUK (Table 3): "Search for support" (inclusively "Trust in higher source"), and "Positive interpretation of disease" which divides into two sub-scales, *i.e.*, "Reflection and change", and "Development".

When compared to the primary structure of the instrument (Table 3), it is evident that the underlying structure is still relevant, albeit the Hebrew version unites "Search for meaningful support" and "Trust in higher source" (which is quite plausible because for Orthodox Jewish individuals these dimensions are not separate) resulting in a combined "Religiosity" scale, and splits the "Positive interpretation of disease" scale in a "Reflection and change" and a "Development" subscale.

##### 3.2.2. Item pool 2

The 13-item support pool appeared to be suitable, demonstrating a Kaiser-Mayer-Olkin value of 0.91. Barlett's test for non-sphericity was also significant ( $p < 0.001$ ).

Exploratory factor analysis revealed two main factors, which explained 61% of variance (Table 3): "Support of life concerns through SpR", and "Support of life through SpR: external sources". Compared with the primary structure of the SpREUK (Table 3), the Hebrew version is similar; however, items 5.1 and 5.2 now load to the scale "Support of life" concerns through SpR, while items 4.9 and 4.10 now load on "Support of life through SpR: External Sources". As a consequence, we had to adjust the titles of the respective scales.

**Table 1.** Mean values of the items and reliability of the SpREUK-Hebrew.

Item Codes	Factors and Items	Mean (0-4)	SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Factors SpREUK 1.1
<b>Item Pool 1: Attitudes</b>						
<b>1. Search for support/Trust in higher Source (alpha = 0.884)</b>						
1.6	searching for an access to spirituality/religiosity	3.23	1.13	0.740	0.888	SMS
1.9	urges me on to spiritual or religious insight	3.20	1.13	0.672	0.890	SMS
1.7	others might be able to teach and help develop my spirituality	3.35	1.08	0.708	0.889	SMS
2.6	religious individual	3.60	1.04	0.632	0.892	THS
1.8	looking for something that gives purpose and meaning in life	3.30	1.11	0.471	0.897	THS
2.5	Trust in a higher power	3.47	1.04	0.560	0.894	THS
1.1	spiritual individual	2.89	1.08	0.493	0.896	SMS
1.5	finding access to a spiritual source can have a positive influence on my illness	3.23	1.15	0.614	0.892	SMS
<b>2a. Positive interpretation of disease: Reflection and Change (alpha = 0.785)</b>						
3.7	illness encourages to reflect on what is essential in life	2.84	1.16	0.558	0.893	PID
3.2	illness as a pointer to change life	2.93	1.29	0.582	0.993	PID
1.4	illness has brought renewed interest in spiritual/religious questions	2.52	1.45	0.472	0.899	SMS
3.4	illness has meaning	3.22	1.11	0.702	0.889	PID
<b>2b. Positive interpretation of disease: Development (alpha = 0.731)</b>						
3.3	illness encourages me to get to know myself better	2.19	1.27	0.428	0.900	PID
3.5	illness is a chance for development	2.23	1.24	0.611	0.892	PID
2.4	able to affect the course of illness by themselves	2.22	1.41	0.554	0.895	PID

Table 1. Cont.

<b>Item Pool 2: Support through SpR</b>						
<b>1. Support of life concerns through SpR (alpha = 0.927)</b>						
4.4	helps to cope better with illness	3.11	1.22	0.804	0.886	SEL-SpR
4.7	helps to restore mental and physical health	2.86	1.23	0.747	0.889	SEL-SpR
4.3	helps me to manage life more consciously	3.40	1.09	0.819	0.887	SEL-SpR
4.1	plays a major role in life	3.20	1.28	0.745	0.889	SEL-SpR
4.2	brings a deeper connection with the world around	2.95	1.24	0.676	0.892	SEL-SpR
4.6	help to see disease as a challenge beneficial for own development	2.50	1.24	0.639	0.894	SEL-SpR
5.1	spiritual activity generally brings a feeling of inner peace	3.14	1.02	0.667	0.893	SIL-SpR
4.8	deepens spirituality/religiosity when practicing with others	2.74	1.28	0.626	0.895	SEL-SpR
5.2	in everyday life, spirituality/religiosity promotes inner strength	2.74	1.25	0.653	0.893	SIL-SpR
<b>2. Support of life through SpR: External Sources (alpha = 0.700)</b>						
4.9	deepens spirituality/religiosity when practicing alone and in silence	2.35	1.32	0.327	0.909	SEL-SpR
5.3	support of the internal life refers to a higher (external) power	2.68	1.26	0.337	0.907	SIL-SpR
4.10	spirituality/religiosity is stimulated at distinct places	3.11	1.22	0.483	0.901	SEL-SpR
4.5	people who share religious/spiritual attitudes are important	3.08	1.13	0.507	0.900	SEL-SpR

Item pool 1 (factors 1, 2a, 2b): alpha = 0.90; Item pool 2 (factors 4, 5): alpha = 0.90;

Abbr.: Search for Meaningful Support (SMS); Trust in Higher Source (THS); Positive Interpretation of Disease (PID); Support in relations with the External life through SpR (SEL-SpR); Support of the Internal life through SpR (SIL-SpR)

**Table 2.** The inter reliability agreement test-retest of the SpREUK-Hebrew questionnaire by Kappa.

	<b>Kappa</b>	<b>p-value</b>
Religiosity (Search for Support/Trust in Higher Source)	0.696	0.001
Positive Interpretation of Disease: Reflection and Change	0.711	<0.001
Positive Interpretation of Disease: Development	0.722	<0.001
Support pf Life Concerns through SpR	0.757	<0.001
Support through SpR: External Sources	0.916	<0.001

**Table 3.** Factorial structure of the SpREUK-Hebrew.

<b>Item Codes</b>	<b>Factors and Items</b>	<b>Factors</b>			<b>Factors SpREUK 1.1</b>
		<b>SpREUK-Hebrew</b>	<b>1</b>	<b>2</b>	
	<b>Item Pool 1: Attitudes</b>				
	<b>1. Religiosity (Search for support/Trust in higher Source) (alpha = 0.884)</b>				
1.6	searching for an access to spirituality/religiosity	<b>0.849</b>	0.250		SMS
1.9	urges me on to spiritual or religious insight	<b>0.764</b>	0.224		SMS
1.7	others might be able to teach and help develop my spirituality	<b>0.740</b>	0.240	0.262	SMS
2.6	religious individual	<b>0.736</b>	0.353		SMS
1.8	looking for something that gives purpose and meaning in life	<b>0.685</b>	0.235		THS
2.5	trust in a higher power	<b>0.667</b>		0.323	THS
1.1	spiritual individual	<b>0.551</b>		0.395	THS
1.5	finding access to a spiritual source can have a positive influence on my illness	0.499	0.235	0.434	SMS
	<b>2a. Positive interpretation of disease: Reflection and Change (alpha = 0.785)</b>				
3.7	illness encourages to reflect on what is essential in life		<b>0.754</b>	0.351	PID
3.2	illness as a pointer to change life	0.220	<b>0.714</b>	0.239	PID
1.4	illness has brought renewed interest in spiritual/religious questions	0.203	<b>0.692</b>		SMS
3.4	illness has meaning	0.388	<b>0.682</b>	0.259	PID

Table 3. Cont.

<b>2b. Positive interpretation of disease: Development (alpha = 0.731)</b>					
3.3	illness encourages me to get to know myself better			<b>0.832</b>	PID
3.5	illness is a chance for development	0.259	0.263	<b>0.726</b>	PID
2.4	able to affect the course of illness by themselves	0.239	0.312	<b>0.600</b>	PID
<b>Item Pool 2: Support through SpR</b>		<b>1</b>	<b>2</b>	<b>3</b>	
<b>1. Support of life concerns through SpR (alpha = 0.927)</b>					
4.4	helps to cope better with illness	<b>0.874</b>		-	SEL-SpR
4.7	helps to restore mental and physical health	<b>0.868</b>		-	SEL-SpR
4.3	helps me to manage life more consciously	<b>0.829</b>	0.290	-	SEL-SpR
4.1	plays a major role in life	<b>0.826</b>		-	SEL-SpR
4.2	brings a deeper connection with the world around	<b>0.779</b>		-	SEL-SpR
4.6	help to see disease as a challenge beneficial for own development	<b>0.746</b>		-	SEL-SpR
5.1	spiritual activity generally brings a feeling of inner peace	<b>0.735</b>		-	SIL-SpR
4.8	deepens spirituality/religiosity when practicing with others	<b>0.682</b>		-	SEL-SpR
5.2	in everyday life, spirituality/religiosity promotes inner strength	<b>0.642</b>	0.325	-	SIL-SpR
<b>2. Support of life through SpR: External Sources (alpha = 0.700)</b>					
4.9	deepens spirituality/religiosity when practicing alone and in silence		<b>0.756</b>	-	SEL-SpR
5.3	support of the internal life refers to a higher (external) power		<b>0.742</b>	-	SIL-SpR
4.10	spirituality/religiosity is stimulated at distinct places	0.279	<b>0.655</b>	-	SEL-SpR
4.5	people who share religious/spiritual attitudes are important	0.310	<b>0.654</b>	-	SEL-SpR

Factor loadings < 0.3 were not depicted;

Item pool 1 (factors 1, 2a, 2b): alpha = 0.90; rotation converged in 6 iterations; 62% explained variance; Item pool 2 (factors 4, 5): alpha = 0.89; rotation converged in 4 iterations; 61% explained variance;

Abbr.: Search for Meaningful Support (SMS); Trust in Higher Source (THS); Positive Interpretation of Disease (PID); Support in relations with the External life through SpR (SEL-SpR); Support of the Internal life through SpR (SIL-SpR)

### 3.3. Correlation analyses

As is shown in Table 4, strong correlations were found between the “Development” topic of the “Positive interpretation of disease” scale with “Religiosity” and with the “Reflection and change” scale. Moreover, “Support of life concerns” was strongly associated with “Religiosity” and with both “Positive interpretation of disease” scales (Table 4).

Compared with the SpREUK 1.1 structure, the SpREUK-Hebrew scale “Religiosity” and also both “Support of life concerns” scales were strongly intercorrelated with the respective scales (Table 4).

As an external indicator of religious engagement, we measured the number of hours spent on spiritual activity (*i.e.*, praying). Here we found moderate correlations between engagement in prayer and “Religiosity” and “Positive interpretation of disease” scales, and a strong correlation with “Support of life concerns through SpR” (Table 4). However, the “External sources of support” did not significantly correlate with the religious daily prayer activity of the individuals.

### 3.4. Acceptability

The participants did not report any difficulty in answering the questionnaire. The mean time spent was six minutes. Problems in answering questions were reported for only 0.7% of the questionnaire items. No patient declined to complete the questionnaire.

### 3.5. Relation between SpREUK scores and socio-demographic variables and oral health

The highest SpREUK-Hebrew scores were found for “Religiosity”, the “Reflection and change” scale, and for “Support of life concerns through spirituality/religiosity”, while the Development scale gained the lowest scores (Table 5). There were no significant differences of SpREUK-Hebrew scores by gender. With respect to age, the lowest SpREUK-Hebrew scores were found in individuals > 40 years of age. Construct validity is supported by the fact that the highest scores were found in the ultra-Orthodox population, while “less-religious” Jewish individuals had scores < 50% (Table 5), indicating no interest in or no importance of the respective issues.

It is interesting to note that in this preliminary method-validation study, high levels of dental caries experience were related to significantly lower “Religiosity” scores and for “Support of life concerns through spirituality/religiosity” as compared to those with low caries level. However, shallow or deep periodontal pockets were related to low scores of “positive interpretation of life: inner development” and again also for “Support of life concerns through spirituality/religiosity”. Similar findings were observed for the mean scores of the SpREUK 1.1 applied to the individuals (Table 6), particularly “Trust in higher guidance” was associated with lower caries experience.

**Table 4.** Correlation between SpREUK-Hebrew sub-scales, primary SpREUK sub-scales and engagement in prayer.

Investigated scales and measures	Religiosity (SMS/THG)	Positive Interpretation of Disease		Support through SpR	
		Reflection and Change	Inner Development	Life Concerns	External Sources
<b>SpREUK-Hebrew</b>					
Religiosity (SMS/THG)	1.000	0.454**	<b>0.514**</b>	<b>0.693**</b>	0.269**
PID: Reflection/Change		1.000	<b>0.562**</b>	<b>0.609**</b>	0.245**
PID: Inner Development			1.000	<b>0.565**</b>	0.300**
Support: Life concerns				1.000	0.312**
Support: External Sources					1.000
<b>Praying engagement</b> (primary version) <b>SpREUK</b>	0.495**	0.342**	0.384**	<b>0.513**</b>	0.106
<b>1.1</b>					
SMS	<b>0.851**</b>	<b>0.699**</b>	<b>0.541**</b>	<b>0.661**</b>	0.272**
THS	<b>0.774**</b>	0.320**	0.334**	<b>0.569**</b>	0.308**
PID	<b>0.543**</b>	<b>0.809**</b>	<b>0.907**</b>	<b>0.679**</b>	0.265**
SELSpR	<b>0.671**</b>	<b>0.543**</b>	<b>0.558**</b>	<b>0.880**</b>	<b>0.622**</b>
SILSpR	0.491**	0.467**	0.443**	<b>0.665**</b>	<b>0.530**</b>

\*\* p < 0.01; \* p < 0.05 (Spearman’s rho)2-tailed). Strong correlations were highlighted.

Abbr.: Search for Meaningful Support (SMS); Trust in Higher Guidance (THG); Positive Interpretation of Disease (PID), Support of External Life through SpR (SELSpR), Support of Internal Life through SpR (SILSpR)

**Table 5.** Demographic and oral diseases data and SpREUK-Hebrew scores.

	%	Religiosity (SMS/THG)	Positive Interpretation of Disease		Support through SpR	
			Reflection and Change	Inner Development	Life Concerns	External Sources
<b>All individuals</b>	100	82.1 ± 20.3	71.8 ± 24.5	55.5 ± 26.4	74.0 ± 24.0	70.2 ± 22.4
<b>Gender</b>						
Male	50	85.4 ± 17.2	71.9 ± 24.7	57.1 ± 25.7	76.6 ± 22.2	69.0 ± 21.8
Female	50	78.9 ± 22.6	71.8 ± 24.6	53.9 ± 27.1	71.5 ± 25.7	71.3 ± 23.0
<b>Age</b>						
		**	*	*	**	**
34-35	34	89.4 ± 9.5	79.2 ± 21.1	62.0 ± 25.7	84.6 ± 13.6	72.8 ± 13.8
36-40	36	85.0 ± 14.7	71.7 ± 22.8	55.7 ± 26.1	76.5 ± 16.0	76.2 ± 16.6
41-45	31	67.2 ± 28.5	63.9 ± 27.9	48.0 ± 26.0	59.6 ± 32.5	60.4 ± 27.5
<b>Education level<sup>a</sup></b>						
		*	*		**	
low education	32	82.5 ± 18.7	75.9 ± 22.1	60.7 ± 23.5	78.6 ± 22.1	72.6 ± 22.0
Yeshiva education	26	89.6 ± 11.1	76.8 ± 21.5	59.3 ± 25.5	83.8 ± 13.8	68.6 ± 21.2
Academic education	42	77.1 ± 24.3	65.6 ± 27.0	49.1 ± 28.0	64.5 ± 27.1	69.3 ± 23.5
<b>Religiosity</b>						
		**	**	**	**	**
Orthodox	60	90.7 ± 8.2	79.6 ± 21.0	61.5 ± 25.9	86.1 ± 10.5	73.6 ± 21.6
Religious	28	78.4 ± 18.9	68.8 ± 21.0	52.2 ± 23.9	67.7 ± 18.2	73.0 ± 14.1

**Table 5. Cont.**

Less-religious	11	45.0 ± 25.5	37.5 ± 19.8	31.1 ± 19.5	25.7 ± 22.7	44.6 ± 27.9
<b>Frequency of Praying</b>		**	**	**	**	**
More than once per day	55	89.1 ± 12.1	77.9 ± 21.4	62.7 ± 24.8	83.4 ± 14.9	71.2 ± 20.1
Once per day	25	86.9 ± 10.0	74.6 ± 21.5	55.9 ± 25.3	77.7 ± 13.7	78.4 ± 19.5
Twice or less per week	9	72.7 ± 15.9	59.4 ± 21.1	44.4 ± 16.4	61.8 ± 17.7	68.2 ± 10.8
<b>never</b>	10	41.3 ± 26.5	43.8 ± 28.9	25.6 ± 21.0	26.6 ± 28.5	46.9 ± 31.8
<b>Caries experience</b>		*		*	*	
High	26	75.4 ± 24.5	70.0 ± 27.4	56.4 ± 29.4	66.3 ± 29.6	67.9 ± 23.4
Low	74	84.4 ± 18.2	72.5 ± 23.6	55.1 ± 25.4	76.8 ± 21.2	71.0 ± 22.1
<b>Periodontal pockets ≥ 4mm</b>				*	*	
<b>Yes</b>	47	79.3 ± 25.2	69.2 ± 26.7	52.5 ± 28.5	69.7 ± 28.9	66.2 ± 25.0
<b>No</b>	53	84.6 ± 14.4	74.1 ± 22.4	58.1 ± 24.2	77.9 ± 17.9	73.8 ± 19.2

Results of the respective sub-groups differ significantly (\*\* < 0.01, \*p < 0.05; ANOVA)

Scores > 50% represent a positive attitude/agreement, while scores < 50% indicate low relevance/rejection of the respective attitude.

Abbr.: SMS/THG - Search Meaningful Support/Trust Higher Guidance

<sup>a</sup>Level of education was categorized into “low education” (no education/elementary school/high school/low orthodox seminar), "Yeshiva education" (orthodox seminar from and above age 18), and "academic education" (university or college).

**Table 6. Demographic and oral diseases data and SpREUK 1.1 scores.**

	%	Search Meaningful Support	Trust Higher Guidance	Positive Interpretation Disease	Support External Life	Support Internal Life
<b>All individuals</b>	100	76.6 ± 21.4	86.4 ± 24.0	65.2 ± 22.8	73.3 ± 21.7	70.3 ± 18.8
<b>Gender</b>						
Male	50	79.9 ± 17.5	88.1 ± 19.5	66.4 ± 23.0	75.3 ± 19.3	70.0 ± 19.0
Female	50	73.5 ± 24.4	84.8 ± 22.3	64.0 ± 22.7	71.3 ± 23.8	70.5 ± 18.8
<b>Age</b>		**	**	*	**	**
34-35	34	83.6 ± 12.5	94.8 ± 8.4	71.9 ± 20.7	81.2 ± 11.7	78.5 ± 13.8
36-40	36	78.2 ± 18.2	90.8 ± 12.7	65.5 ± 21.1	77.2 ± 14.1	70.5 ± 16.3
41-45	31	67.2 ± 28.5	72.2 ± 29.7	57.5 ± 24.9	60.0 ± 30.1	61.0 ± 22.1
<b>Education level<sup>a</sup></b>			*	*	**	*
Low education	32	78.0 ± 19.4	87.0 ± 21.3	69.4 ± 20.6	77.1 ± 19.7	74.9 ± 16.6
Yeshiva education	26	82.6 ± 13.0	93.3 ± 11.6	71.0 ± 20.3	80.4 ± 10.5	72.7 ± 18.6
Academic education	42	71.9 ± 25.8	81.7 ± 24.0	58.4 ± 24.4	65.9 ± 26.0	65.3 ± 19.7
<b>Religiosity</b>		**	**	**	**	**
Orthodox	60	85.1 ± 11.4	94.5 ± 9.7	72.4 ± 19.8	83.2 ± 10.4	76.6 ± 16.2
Religious	28	72.1 ± 21.8	86.0 ± 14.9	61.3 ± 20.2	69.7 ± 15.7	66.9 ± 15.6
Less-religious	11	42.5 ± 25.3	43.9 ± 26.8	36.1 ± 19.3	29.3 ± 22.9	45.0 ± 16.4
<b>Frequency of praying</b>		**	**	**	**	**
More than once per day	55	83.3 ± 14.9	92.7 ± 11.2	72.5 ± 20.0	80.7 ± 12.5	74.1 ± 17.5
Once per day	25	81.9 ± 12.6	92.2 ± 12.3	65.6 ± 20.0	78.5 ± 12.9	73.3 ± 15.8
Twice or less per week	9	66.3 ± 17.7	78.5 ± 17.6	53.1 ± 16.9	61.9 ± 15.2	69.3 ± 11.1
<b>never</b>	10	37.5 ± 26.4	46.4 ± 32.3	36.3 ± 21.8	31.4 ± 30.3	43.8 ± 17.2

Table 6. Cont.

Caries experience			*		*	*
High	26	71.4 ± 24.8	79.3 ± 28.6	64.4 ± 26.2	67.5 ± 26.2	64.8 ± 20.1
Low	74	78.5 ± 19.8	89.0 ± 16.9	65.5 ± 21.6	75.3 ± 19.6	72.2 ± 18.1
Periodontal pockets ≥ 4mm				*		
Yes	47	73.8 ± 26.0	83.3 ± 25.8	62.7 ± 25.6	68.7 ± 77.4	67.8 ± 21.5
No	53	79.2 ± 16.0	89.2 ± 15.1	67.4 ± 19.9	77.4 ± 15.2	72.5 ± 15.9

Results of the respective sub-groups differ significantly (\*\* < 0.01, \*p < 0.05; ANOVA)

Scores > 50% represent a positive attitude/agreement, while scores < 50% indicate low relevance/rejection of the respective attitude.

<sup>a</sup>Level of education was categorized into "low education" (no education/elementary school/high school/low orthodox seminar), "Yeshiva education" (orthodox seminar from and above age 18), and "academic education" (university or college).

#### 4. Discussion

The SpREUK questionnaire was designed to be used in individuals in secular societies (with a Christian background), and thus avoiding exclusive terms such as God, Jesus, church *etc.*) [27-33]. Recently, an Arabic version of SpREUK was used in patients from Jenin, Palestine [32]. The purpose of this study was to translate and validate a Hebrew version of the instrument, which was tested in a Jewish population. Data from the current analysis demonstrate the reliability and validity of the Hebrew version of SpREUK, and support the employment of SpREUK-Hebrew among Jewish populations as a valid indicator of both the "Search" and "Trust" aspect of spirituality/religiosity. This translation of a religious/spiritual scale, originally designed for use among German Christian religious and secular communities (atheist/agnostics), for a Jewish population, and from English to Hebrew, is unique. In fact, Jewish communities, Orthodox, religious and less religious, are unique and demand special care when attempting to measure spirituality. We have not located any similar attempt at comparing Jewish denominations by spirituality in the literature.

The traditional and cultural adaptation of the questionnaire did not essentially damage the sub-scales. However, the Hebrew version unites "Search for Meaningful Support" and "Trust in Higher Source" to a single factor which is plausible because for Orthodox Jews spirituality and religiosity are not regarded as separate contexts, as compared to German Christian and secular individuals, among whom the method had originally been applied [32]. Among more secular German people, with a predominance of the Christian denomination and a large fraction of atheistic/agnostic individuals, "Search for support/access" and "Trust in higher source" were separate dimensions, albeit strongly associated [28-33]. Both dimensions were strongly interconnected in the current Jewish sample, and also among the previously studied Arab Muslims from Jenin [32].

In contrast to SpREUK 1.1, the scale "Positive interpretation of disease" is now divided into two subscales: "Reflection and change", and (inner) "Development". In particular, the attitude that illness may be a pointer to change one's way of life was of high relevance among the Orthodox population, but not among less-religious individuals.

Judaism, Islam and Christianity are collectively known as the "Abrahamic" monotheistic faiths (referring to a spiritual covenant between God and Abraham) and display several similar spiritual

aspects. Christianity has a close relationship with Judaism, both historically and theologically. The idealistic views of both religions may not necessarily be heeded by the individuals in their daily life, and thus it is required to differentiate between spiritual attitudes and convictions on the one hand, and a concrete engagement in spiritual practices on the other. It is mentionable that in the present study the engagement in spiritual activity was strongly associated with “Religiosity” and the support of life concerns, which confirms construct validity.

Notwithstanding (and avoiding) the debatable theological differences between Christianity and Judaism, it is undeniable that the general outlook, basic philosophy and even realm of syntax for the two religions, are decisively different. It is therefore of substantial interest that in the current research, the same tool (SpREUK) has been found to effectively measure spirituality in both religions.

This study was primarily intended to validate the Hebrew version of SpREUK. We examined the oral health of the sample and preliminary findings indicate a notable relationship between caries experience and components of the method: “Religiosity” (particularly the “Trust in higher guidance” aspect) and also “Support of life concerns”. A limitation of the present study, might be that we included a sample of relatively healthy people with only oral diseases, while previous research with SpREUK was performed predominantly among chronically ill (cancer in the German research) patients.

The association between SpREUK components and oral health may be due to better oral health behavior due to the religious demands and rules, or to higher level of social support in the Orthodox Jews. A larger sample and a deeper analysis by this tool will be necessary to examine the full association between religiosity, spirituality and oral disease. Further studies with the SpREUK-Hebrew should also test the validity among patients with chronic (internal) diseases.

It should be noted that many Hebrew speakers are not Jewish and many Jews do not speak Hebrew. This questionnaire therefore needs to be validated on other Jewish samples outside of Israel where there is more variety in religiousness, with lower proportions of Orthodox communities.

## 5. Conclusions

The traditional and cultural adaptation that was applied to the SpREUK-Hebrew questionnaire was found to be appropriate. The instrument effectively discriminated between religious subgroups (*i.e.*, ultra Orthodox, conventional religious and less-religious), and can therefore be adopted as a reliable and valid indicator of spirituality/religiosity among Jewish Hebrew speaking populations. The scores of SpREUK 1.1 and its Hebrew version are similar, but not identical, in this study. We should, therefore cautiously use the tool in comparative inter-religion studies, enrolling individuals from different cultural and religious backgrounds.

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