

# Domains of spirituality and their importance to the health of 75 533 adolescents in 12 countries

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## Summary

Spirituality is an ancient concept with many contemporary applications to the field of health promotion. While recognized in the UN Convention on the Rights of the Child as a basic human right, definitional misunderstandings about what spirituality is, and is not, and the mechanisms by which it affects the health of young people, remain. In this cross-national analysis involving >75 000 adolescents from 12 countries, we examined the relative importance of each of four spiritual health domains (connections to self, others, nature and the transcendent) in the lives of young people, and how these connections relate to a standard indicator of positive mental health status. Descriptive and applied regression analyses confirmed two major findings: (i) boys and girls in all 12 countries ranked the importance of each of the four domains in the same order, with 'connections to self' identified as most important; and (ii) both direct and indirect pathways are evident that connect the remaining three domains to positive mental health status, but through strong connections to self. Based on our scale items, fostering a strong connection to self, which involves cultivating a sense of meaning, purpose and joy in the lives of adolescents, appears most fundamental to fostering optimal mental health. This may be achieved directly or, dependent upon context and culture, indirectly with emphasis on the connections afforded by the other three domains. Such findings provide important insights to guide the content of adolescent health promotion interventions.

## Lay Summary

Spirituality is considered by many to be an important domain of health. It is sometimes measured in four domains of connections: to oneself, to others, to nature and to the transcendent. While the

importance of such connections is recognized as a fundamental human right for children, few international studies have studied their impacts on the health and well-being of young people. In this study of young people conducted over 4 years in 12 countries, we examined the perceived importance of each of four spiritual health domains and how they each related to positive mental health status in >75 000 adolescents. 'Connections to self' were consistently viewed as most important among boys and girls in all 12 countries. Fostering of strong connections to self, which involves cultivating a sense of meaning, purpose and joy in the lives of adolescents, appears most fundamental to achieving mental health and well-being. This may be achieved directly through a focus on connections to self, or indirectly by focusing on the indirect effects of the other three domains on mental health. This opens up many opportunities for health promotion in child populations, internationally.

**Key words:** adolescence, connections, epidemiology, mental health, spirituality

## INTRODUCTION

Spiritual dimensions of health, while seldom acknowledged in official definitions of health and health status (World Health Organization, 1948), have long been recognized as being fundamentally important to young people (Hay and Nye, 1998; King and Benson, 2006; Scales *et al.*, 2014). Spiritual health correlates highly with established measures of mental (Fisher, 2010; Michaelson *et al.*, 2016a; Brooks *et al.*, 2018) and general (Michaelson *et al.*, 2016b) health status, and it is considered the 'fourth domain of health', along with physical, mental and social dimensions (Chirico, 2016). Spiritual health and well-being are also recognized and protected as fundamental rights in the UN Convention on the Rights of the Child (United Nations General Assembly, 1989). Adolescence is an important developmental stage where many cognitive, emotional, moral (values) and spiritual (Kohlberg, 1984) structures are formed and stabilized. Spiritual health therefore remains a priority for the field of adolescent health promotion.

Despite strong evidence pointing to the importance of spiritual health, a definition of spiritual health remains elusive, and there is little consensus academically as to what spiritual health actually means. Some branches of this field of study approach this idea from religious roots and conflate the term spirituality with involvement in formal religion (Crompton, 1999; Cotton *et al.*, 2006). Others have documented the importance of spirituality to children and young people irrespective of their culture or religious traditions (Yust *et al.*, 2006). Yet even when examined as a broader concept that goes beyond religious expression, this field is challenged by a lack of standard terminology and operational definitions.

One conceptual framework stands out in its widespread acceptance to the study of child spirituality. According to this framework, 'spirituality' (Nye, 2009), 'spiritual well-being' (Gomez and Fisher, 2003) or

'spiritual health' (Michaelson *et al.*, 2016a) can be viewed as the strength of one's connections in four domains: to oneself, to others, to nature and to the transcendent. Originally proposed by the National Interfaith Coalition of Aging Project (National Interfaith Coalition on Aging, 1975), this framework has since been refined and evaluated by individual research groups and has been adapted for research involving surveys of children [e.g. (Hay and Nye, 1998; Fisher, 2010, 2011; Holder *et al.*, 2010)]. A body of psychometric research supports this four-domain framework and has led to the development of multi-dimensional scales [for a summary, see de Jager Meezenbroek *et al.* (2012)]. Users of such scales are encouraged to subdivide items describing spiritual connections in the lives of children by the four domains. In addition, based on exploratory factor analyses, there is also an over-riding assumption that 'a single higher-order factor' exists that provides an overall indication of spiritual well-being (Gomez and Fisher, 2003) that can be measured in composite and compared between groups of children.

In a series of national and international analyses conducted with adolescents in a variety of European, North American and Middle Eastern countries (Michaelson *et al.*, 2016a,b, 2019; Brooks *et al.*, 2018), our research group has used a simple adaptation of the four-domain framework in population health studies. An initial exploratory factor analysis supported the idea that a single higher order factor existed. Yet when our data were subject to confirmatory factor analyses, it became clear that spiritual health is indeed best analysed and measured by domain (Michaelson *et al.*, 2016a). Further, when our adapted version of the spiritual health scale was used to study relationships between the four domains and established indicators of health status, path analyses suggested that the domains were not acting equally as predictors of adolescent health.

In the present analysis, we continue this work using health data collected from over 75 000 adolescents in 12 countries. Through this analysis, we add to the debate surrounding the optimal paradigm for how spiritual health is best conceived and measured. Beyond theory, we aimed to determine whether the four spiritual health domains are considered equally by young people in terms of the perceived importance of these connections in their lives. Furthermore, we examined the extent to which similar pathways exist across countries, genders, cultures and time periods and provide evidence of more universal relationships between healthy spirituality and positive mental health status in adolescent populations.

## METHODS

### Survey methodology

Adolescent health surveys that included assessments of spiritual health, mental health status and relevant demographic covariates were conducted in 12 countries over two survey cycles as part of the WHO-affiliated Health Behaviour in School-aged Children study (Inchley *et al.*, 2017). Countries involved were as follows: 2013/2014 only: Israel, Slovakia, Czech Republic; 2017/2018 only: Lithuania, Moldova, Russia and Wales; and both 2013/2014 and 2017/2018: Canada, England, Latvia, Poland and Scotland. Young people in each country and survey cycle were asked about different aspects of their health and well-being following a standard international protocol. Recruitment followed a multi-stage sampling design, with participants nested within schools, then geographic regions (e.g. provinces, states, territories), then countries. Sampling was stratified by type of school and geographic regions on a replacement basis. Parental consent was active or passive, dependent upon local school board requirements, and child assent was also obtained. Participating students completed an anonymous questionnaire during a 40- to 60-min in-classroom session. Questionnaires were returned by the school staff to central research centres in each country for data entry, cleaning and analysis. National teams obtained approval to conduct the survey from the ethics review board associated with each of their respective institutions.

### Spiritual health

A module describing adolescent spiritual health was introduced to HBSC in 2013/2014. This consisted of eight questions (two per domain) adapted (for brevity and

literacy level) from an existing Spiritual Well-being scale (Gomez and Fisher, 2003) and then validated psychometrically in Canada and Scotland (Michaelson *et al.*, 2016a). In the 2017/2018 HBSC survey, the module was updated to include the original eight plus two new items, although to maximize the available sample the original validated 2013/2014 module was maintained in this analysis. In both survey cycles, students were requested to identify how important it is for them to: 'feel that your life has meaning or purpose'; 'experience joy (pleasure, happiness) in life' (connections to self); 'be kind to other people'; 'be forgiving of others' (connections to others); 'feel connected to nature'; 'care for the natural environment' (connections to nature); 'feel a connection to a higher spiritual power'; 'meditate or pray' (connections to the transcendent). Response options for all items followed a 5-point scale ranging from 0—'not at all important' to 4—'very important', and summary scores (range 0–8) were obtained for each of the four domains. Cronbach's  $\alpha$  coefficients in all four domains were acceptable (all >0.7).

### Mental health

We used the HBSC subjective health complaints index (Haugland and Wold, 2001) as an indicator of mental health. This asks about the frequency of specific somatic and psychological symptoms that may impair everyday function. Youth report how often in the last 6 months (0 = 'rarely or never' to 4 = 'about every day') they experienced the following: headache, stomach ache, backache, feeling low, irritability or bad temper, feeling nervous, difficulties in getting to sleep and feeling dizzy (Cronbach's  $\alpha$  = 0.84) (Freeman *et al.*, 2016). Responses are summed to create a composite scale ranging from 0 to 32 (Haugland and Wold, 2001). Collectively, this scale is measuring a unidimensional latent trait of psychosomatic problems, an indicator of mental health. When reverse coded, lower scores are indicative of positive mental health status.

### Covariates

Students reported the date of survey completion and their month and year of birth, from which age was estimated. They reported whether they were a 'boy' or a 'girl'. Individual family affluence [FAS III; the validated HBSC measure of socioeconomic status (Hartley *et al.*, 2016)] was measured by assessing answers to six items describing material conditions of their household. Responses were summed into a composite scale with a

possible range of 0 (low affluence) to 13 (high affluence). Two continuous subscales of the Multidimensional Scale of Perceived Social Support were used to measure the availability of emotional support and help within the family ( $\alpha \geq 0.90$ ) and in peer groups ( $\alpha \geq 0.94$ ) (Zimet *et al.*, 1990).

## Statistical analysis

### Descriptive

We characterized the available samples in each country by age group (11, 13 and 15 years) and gender. In the five countries that included the spiritual health module in both survey cycles, samples were combined. We then described the percentages of boys and then girls in each country that scored each of the four spiritual health domains as most important (inclusive of ties) relative to the other domains, based on domain-specific scores. Next, Spearman's rho statistics were used to measure the strength of associations between the four domains, as well as the number of countries for which a positive and statistically significant correlation was observed for these correlations.

### Regression analyses

Based on past analyses (Michaelson *et al.*, 2019), we then tested the universality of a proposed structural equation model (SEM) that suggested that 'connections to self' played a central, mediating role in relationships between the other three domains and mental health status. A path analysis approach to SEM was used with a maximum-likelihood approach for effect estimation. Models were developed first using the data for all countries combined, then they were repeated within the country-specific samples. Models were stratified by gender and also controlled for all covariates specified *a priori* (as above) based on this past regression analyses (Michaelson *et al.*, 2019). These SEM models were used to simultaneously isolate the strength of direct associations between each domain and self-reports of positive mental health, as well as the indirect associations between each of three domains (connections to others, nature and the transcendent) and this health outcome as mediated by connections to self. The effect sizes were described as beta coefficients, with higher absolute values indicating stronger associations.

Statistical power to detect socially meaningful effects varied within strata defined by country, gender and domain, but was generally adequate (>80%). Data analyses were conducted with SAS 9.4 (Cary, NC) and SPSS Amos 25.0.x. Statistical significance was set at  $p < 0.05$ .

While most country samples were self-weighting, in some countries [Canada, England, Israel, Scotland (2014), Wales, England (2018)], a weighting variable was applied to ensure national representativeness.

## RESULTS

The total sample included reports from 75 533 young people in 12 countries, with a minimum of 639 reports collected in 2013/2014 in one cycle in Slovakia and a maximum of 21 698 reports (Canada) collected in both cycles (Supplementary Table S1). There was a roughly equal split between boys and girls in each age group within each country. Seven countries asked the spiritual health items in all age groups, while five limited these questions to one or both of the two older age groups.

Table 1 describes the percentage of boys and girls in each country for whom each domain was ranked as most important relative to the four domains, according to reported domain-specific scores and inclusive of ties. A universal pattern was evident across the 12 countries. Amongst both boys and girls, young people consistently ranked connections to self as the most important, followed by connections to others, to nature, then to the transcendent. Variations in these percentages between countries were also notable. Amongst boys, the smallest variations were observed for connections to self (72–82%), and the largest were seen for connections to the transcendent (12–46%). Amongst girls, variations were much larger than boys in general, and the most notable range in variation was for connections to others (36–73%) and also in the transcendent domain (9–46%).

Correlations between the four domains, stratified by gender, are presented in Table 2. Each spiritual health domain was at least modestly correlated (Spearman's rho 0.26–0.56) with the three remaining domains in a statistically significant ( $p < 0.001$ ) manner in virtually all countries and in both genders; however, connections to the transcendent was least correlated with the other three domains. It was also notable that the correlations almost directly followed a distinct pattern where the correlations were consistently highest between the 'self' and other domains, and lowest between the 'transcendent' and other domains.

In Table 3, we provide the results of our path analysis (SEM) to examine the strength of effects, both direct and indirect, for each of the domains and positive mental health (infrequent subjective health complaints). In the full sample (all countries pooled), we identified total effects in both boys and girls suggestive of strong and statistically significant relationships between each of the

**Table 1:** Percentage of students for whom each domain ranked the highest of all four domains, HBSC spiritual health scale

Country	Percentage of students ranking the domain as the most important (inclusive of ties)							
	Boys				Girls			
	Self	Others	Nature	Transcendent	Self	Others	Nature	Transcendent
Canada	77	65	47	26	73	67	49	22
Czech Republic	82	43	42	15	83	45	38	9
England	77	62	35	21	71	66	35	16
Israel	82	52	33	33	86	50	32	29
Latvia	81	36	33	15	82	36	30	9
Lithuania	78	54	37	14	76	58	41	13
Moldova	81	67	52	46	80	73	54	46
Poland	73	60	33	27	70	64	27	18
Russia	76	55	42	25	78	53	39	18
Scotland	75	55	31	14	69	65	29	10
Slovakia	80	54	39	23	78	53	34	15
Wales	72	53	33	12	67	58	31	9
Total	76	57	39	21	73	61	38	18

**Table 2:** Correlation matrix describing strength of associations between the ranked importance of the four domains (Spearman's rho) and the number of countries for which a positive and statistically significant correlation was observed

	Boys				Girls			
	Self	Others	Nature	Transcendent	Self	Others	Nature	Transcendent
<b>Self</b>								
Rho	1.00	0.59	0.51	0.26	1.00	0.52	0.47	0.28
(p value)		<0.001	<0.001	<0.001		<0.001	<0.001	<0.001
Countries <sup>a</sup>		12	12	-11 <sup>b</sup>		12	12	12
<b>Others</b>								
Rho		1.00	0.54	0.31		1.00	0.48	0.31
(p value)			<0.001	<0.001			<0.001	<0.001
Countries <sup>a</sup>			12	12			12	12
<b>Nature</b>								
Rho			1.00	0.44			1.00	0.45
(p value)				<0.001				<0.001
Countries <sup>a</sup>				12				12
<b>Transcendent</b>								
rho				1.00				1.00

<sup>a</sup>Number of countries (out of 12) reporting statistically significant ( $p < 0.05$ ) positive correlation.

<sup>b</sup>Czech Republic: rho = 0.06 ( $p = 0.12$ ).

domains and infrequent subjective health complaints. When broken down into direct and indirect effects, however, the connections to self domain was directly associated with this mental health outcome ( $\beta = 0.19$  in boys, 0.22 in girls), while connections to the other domains were mainly indirect effects on the pathway linking connections to self and infrequent subjective health complaints. When the analysis was stratified by country,

among boys, in most (9/12) countries we identified a positive and statistically significant direct effect between connections to self and the health complaints. We identified an analogous direct effect in very few countries for the other three domains. However, positive indirect effects were observed in the majority (10/12) of the countries for both connections to nature and to others, where such connections were mediated by connections

**Table 3:** Relationships between the spiritual health domains and low levels of subjective health complaints: path analysis

Standardized effect estimates taken from the fully adjusted models for boys and girls, full sample (pooled data)											
Gender	Total effects			Direct effects			Indirect effects				
	Beta	(95% CI)	p	Beta	(95% CI)	p	Beta	(95% CI)	p		
Boys											
Self	0.19	(0.17 to 0.20)	0.01	0.19	(0.17 to 0.20)	0.01	/	/	/	/	
Others	0.09	(0.07 to 0.10)	0.01	0.01	(-0.01 to 0.03)	0.25	0.08	(0.07 to 0.09)	0.01	0.01	
Nature	0.08	(0.06 to 0.09)	0.01	0.03	(0.01 to 0.04)	0.01	0.05	(0.05 to 0.06)	0.01	0.01	
Transcendent	-0.02	(-0.03 to -0.01)	0.01	-0.02	(-0.03 to 0.00)	0.01	0.00	(-0.00 to 0.00)	0.01	0.81	
Girls											
Self	0.22	(0.21 to 0.23)	0.01	0.22	(0.21 to 0.23)	0.01	/	/	/	/	
Others	0.09	(0.08 to 0.10)	0.01	0.01	(0.00 to 0.03)	0.07	0.08	(0.07 to 0.08)	0.01	0.01	
Nature	0.08	(0.07 to 0.09)	0.01	0.01	(0.00 to 0.03)	0.03	0.06	(0.06 to 0.07)	0.01	0.01	
Transcendent	0.01	(0.00 to 0.03)	0.01	0.00	(-0.01 to 0.02)	0.58	0.01	(0.01 to 0.01)	0.01	0.01	
Total number of countries (n = 12) reporting statistically significant effects (p < 0.05)											
Gender	Total effects			Direct effects			Indirect effects				
	Positive (p < 0.05)	None	Negative (p < 0.05)	Positive (p < 0.05)	None	Negative (p < 0.05)	Positive (p < 0.05)	None	Negative (p < 0.05)		
Boys											
Self	9	3	0	9	3	0	/	/	/	/	
Others	8	4	0	2	9	1	10	2	0	0	
Nature	6	6	0	1	11	0	10	2	0	0	
Transcendent	1	9	2	1	9	2	2	7	3	3	
Girls											
Self	9	3	0	9	3	0	/	/	/	/	
Others	7	5	0	2	8	2	9	3	0	0	
Nature	7	5	0	3	8	1	9	3	0	0	
Transcendent	2	9	1	2	9	1	6	5	1	1	

<sup>a</sup>All models adjusted for age, family affluence (FAS), peer and family support. <sup>b</sup>Domains of spiritual health range= 0–5, subjective health complaints = 0–32.

to self. For connections to the transcendent, very few direct or indirect effects were identified. Overall, the patterns of effects observed for girls were quite similar, with the exception that positive indirect effects of connections to the transcendent, as mediated by connections to self, were identified in 6/12 countries.

## DISCUSSION

In this international study of spiritual health in populations of young people, we had two striking findings. *First*, based upon domain-specific scores describing the importance of the four domains of spiritual health in the lives of these young people, study participants consistently ranked connections to self as most important, followed by connections to others, nature, then the transcendent in descending order. This pattern was evident for both boys and girls in all (12/12) countries. *Second*, based upon our structural equation modelling, we demonstrated that the perceived importance of connections to self was directly associated with a positive indicator of mental health, and these connections appeared to mediate associations between connections to others and nature with the same mental health outcome in most countries, with more mixed findings for connections to the transcendent. In other words, the effects of some domains (i.e. connections to nature, others and the transcendent) on the studied health outcomes were mediated by the central role of connections to self in such pathways (Michaelson *et al.*, 2019), suggestive of a much more complex (and perhaps fascinating) aetiology. These findings have implications for how adolescent spiritual health is conceptualized and measured, and provide insights about how one might approach the targeting of interventions aimed at promoting positive mental health in adolescents.

The fact that connections to self are perceived by adolescents as most important resonates with other literature [e.g. (Damon *et al.*, 2003)]. One item in this domain directly measures how strongly young people rate the importance of experiencing meaning and purpose in their lives. Past studies have established the eagerness with which many children ask deep questions about matters of ultimate concern and to experience a sense of meaning in their own lives (King and Benson, 2006). The second item contained in this domain surrounds the importance of experiencing joy, pleasure and happiness in life. This too may be vital to the health of young people. While some have cautioned that this priority may potentially be highly individualistic and even ‘destructive of human community’ [(Hay, 2000), p. 47], our findings suggest a more nuanced interpretation.

Experiences of joy, pleasure and happiness appear to go together, both conceptually and statistically, with quests for meaning and purpose. Indeed, something both profound and healthy may be happening within the ‘connections to self’ domain as it relates to mental health experiences in that these two seemingly distinct aspects of life are so closely related. While both meaning and purpose [e.g. (Antonovsky, 1987)] and experiences of joy [e.g. (Seligman, 2004)] have been studied individually, our findings suggest that indeed, they may be working together synergistically so that the combined effect is strengthened. Such connections to self are at the heart of the protective effects of spiritual health as a whole, and those related to the other three domains.

Our second major finding is that relationships between the other three domains (to others, nature and the transcendent) and mental health appear to go through an indirect pathway that still involves experiences of strong ‘connections to self’. Our analysis confirms the universality of this finding in 12 countries for connections to others and to nature, with some evidence for connections to the transcendent. Acceptance of this mediated pathway offers a theoretical challenge to the discipline of spirituality to reconsider any assumptions it has about the unidimensional nature of its scales, and the idea that the four domains work together in an equally balanced way. Moreover, it offers new insights as to how the protective features of strong connections to others, to nature and to the transcendent (e.g. whatever one considers as ultimate) do not occur as isolated, direct effects. We propose that they act on mental health, individually or in composite, by changing or supporting the inner worlds of young people. For example, meaningful connections to others within their social worlds and the satisfaction of the need for relatedness may enhance an adolescent’s ability to experience a sense of purpose and joy. Through these pathways, young people achieve strong connections to self and a sense of inner well-being, and this in turn is reflected in positive indicators of mental health. This supports the notion of eudaimonic well-being (Ryan and Deci, 2001) which emphasizes the importance of fulfilling one’s potential and experiencing meaning in life. This sense of purpose is not only perceived to be highly important to the majority of adolescents but is strongly influenced by the connections young people have with the world around them.

Our findings have implications for clinical and population health interventions. *First*, they point to the need for a renewed focus on issues like meaning, purpose and related joy as major points of intervention for young people who are struggling with mental health challenges.

Strong connections to self may provide the most direct link between what is viewed as a healthy spirituality and subjective well-being. *Second*, our findings identify a set of intermediate endpoints that can be used in the study of interventions that involve intentional focus on connecting with others, or nature, or the transcendent. By understanding and embracing such pathways and mechanisms, it may be possible to evaluate their effects in the short term using such intermediate indicators with hope for more long-term benefits on mental health if they are sustained. *Third*, the SEM points to multiple points of intervention associated with spiritual health that may foster positive mental health outcomes, which shows promise for societies where young people access their individual spiritualities in diverse manners. Some young people may express their spirituality overtly via a strong connection to a god, consistent with various faith commitments. Others may express it in their relationships with other people. And still others may express it in deep and meaningful connections to nature. All of these may hold promise as possible points of intervention.

The centrality of connections to self and particularly the item ‘purpose and meaning in life’—what others have described as *meaning making* (Park, 2010), warrants further comment. We observed strong and consistent associations between connections to nature and connections to self, suggesting that experiences of meaning in life may indeed come from some deeper connection with nature. This importance of this theme has been well documented (Lou 2008, 2016), and in particular for young people from rural communities (Wells and Evans, 2003) and with Indigenous heritages (Tagalik, 2010; Hatala et al., 2020). Meaning making is also a common theme when young people reach out, help and connect with other people in acts of prosocial behaviour (King and Benson, 2006; Scales et al., 2014), which too correlate with better mental health (Moksnes et al., 2012). Our finding of an inconsistent and rather modest relationship between the transcendent and self domains was unexpected given past literature suggesting that a strong connection to the transcendent can be a central part of meaning making, in that it may shape a coherent narrative about one’s place and role in the world (Benson et al., 2005; Johnson, 2008; King et al., 2011). Connections to God or a higher spiritual power through acts of meditation and prayer are seen as essential elements of many faiths. Yet, with some exceptions (e.g. Israel, Moldova) such connections were generally viewed as the least important of the four domains and did not relate strongly or consistently with the connections to self

domain that emphasizes such meaning in life. This finding is curious and may reflect a general phenomenon of secularization that sees fewer young people engaged in organized religion with required acts of devotion. Still, through their responses to the other three domains it appears that many young people still embrace spiritual worldviews that focus on healthy connections and that foster a sense of meaning and belonging. These in turn provide frameworks for living healthy, connected and ethical lives (De Souza and Halafoff, 2017).

Interpretation of our analytical findings is also informed by past debate surrounding the properties of spiritual health scales that rely on the four-domain model of connections to self, others, nature and the transcendent. The essence of that debate is that by focusing on ‘meaning and purpose’ and ‘joy’ in life the ‘connections to self’ domain may be using measures of adolescent well-being to measure adolescent well-being (Koenig, 2008; Garssen et al., 2016). This in turn would make measures in that domain ‘tautological’ (Koenig, 2008) with other measures of adolescent mental health, and it is this property that makes it appear that connections to self are so central in the aetiological pathways explored in our analysis. However, in past analyses we (Brooks et al., 2018) have argued that the specific indicators used to construct these measures of connections to self are distinct from the indicators of mental health symptoms used in our analysis—these are not tautological per se. Further, our findings that connections in the other domains (others, nature, transcendent) are related to mental health status via a pathway that involves possible mediation via enhanced connections to self (from the field of spirituality) or adolescent well-being (from the positive psychology literature) is informative, irrespective of what one calls that mediated effect. It is plausible that by incorporating items suggestive of adolescent well-being [from the positive psychology field (Seligman, 2004) into scales describing their spirituality (from the spiritual health field (Gomez and Fisher, 2003)], that important aetiological pathways are revealed, irrespective of what one calls them or what conceptual framework or tradition guides the analysis.

Strengths of our analysis include the robust and diverse nature of our sample, our use of a practical, abbreviated spiritual health measure that has demonstrated validity (Michaelson et al., 2016a, 2019; Brooks et al., 2018) and the novelty of this line of enquiry. Our analysis replicates and extends several ideas that were initially generated in national analyses. Limitations include our

reliance on self-reports that are subject to misclassification and information bias, and our use of cross-sectional data; study findings require confirmation longitudinally. Our adaptation of an abbreviated (eight item) spiritual health scale has been criticized (Fisher, 2016), although we have demonstrated face and construct validity over time, and its use is clearly supported by extensive psychometric testing in 12 countries (data not shown), and similar abbreviated versions of this scale have now been proposed in other contexts (Fisher and Ng, 2017). In addition, the generalizability of our findings is limited by the fact that the HBSC study only focuses on countries in Europe, the Middle East and North America. This is particularly relevant with respect to connections identified for the transcendent domain. Most of the countries involved in HBSC are highly secular with <50% of their populations reporting that religion is important to them (Pew Research Center, 2019). These percentages are much lower than that reported in the Global South (e.g. Africa, South America) where the reported importance of religion is much higher (Pew Research Center, 2019). Our prevalence estimates and perhaps even the mediated pathways under study identified may be quite different from those experienced by adolescent populations in other contexts.

Attention to other research on adolescent spirituality and spiritual development that has found contextual—such as geographic and cultural—differences in how young people experience spirituality on a more global level (Kimball *et al.*, 2009; Roehlkepartain *et al.*, 2008) suggests that if our sample was more representative globally, we might well observe different patterns, in particular around pathways associated with the transcendent domain.

The idea of promoting a healthy spirituality in the lives of children as part of professional practice in the field of health promotion is not new, but it may represent a paradigm shift for some. The relationships that we have observed among adolescents from 12 countries are strong, consistent and indicative of something important going on in their lives. The importance of fostering healthy connections in the inner lives of children, whether this surrounds the establishment of meaning and purpose, or instilling some sense of joy or happiness in their lives, are widely accepted concepts. The universality of these findings across 12 countries with diverse socio-cultural histories and contexts, their practical nature and the way that they build on a long legacy of scholarship are strengths. Our findings point to the central need for evidence-based practices in the field of spiritual health, supported by high levels of evaluation, that foster meaning, purpose and joy in the inner worlds of young people. Differences between hedonic (i.e. pleasure oriented) or eudaimonic (i.e. meaning

oriented) aspects of spirituality require further study. Our results also point indirectly to the mechanisms that other types of connections—be they with others, nature and the land, or those grounded in some kind religion (formal or informal)—are part of and ultimately may lead to improvements in the mental health of adolescents. This lays a foundation for many different avenues for health promotion in adolescent populations, both established and proposed.

In conclusion, in this novel cross-national analysis, we established the relative importance of four domains of spiritual health in the lives of adolescents in 12 countries. We documented consistent and universal patterns in how young people rate each of these domains in terms of the importance in their lives. We also confirmed pathways that demonstrates the centrality of connections to self (meaning, purpose and joy) to positive mental health, and ultimately identifies that manner in which the other domains may also be influential.

## SUPPLEMENTARY MATERIAL

Supplementary material is available at *Health Promotion International* online.

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## ETHICS

National teams obtained approval to conduct the survey from the ethics review board associated with each of their respective institutions.

## CONFLICT OF INTEREST STATEMENT

None declared by any author.

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