

# The Relationship Between Spirituality, Health and Life Satisfaction of Undergraduate Students in the UK: An Online Questionnaire Study

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Abstract	US students with higher spirituality scores report better health and life satisfaction. This is the first UK study to explore the relationship between spirituality, health and life satisfaction of undergraduate students. Over 500 undergraduates completed an online questionnaire. Significant differences in spirituality score were present across college, ethnicity and religious belief. There appears to be a desire for spirituality amongst many students. Universities have a role to play in supporting students' search for meaning and purpose. Additional research is warranted to further understand the role of spirituality in the health and well-being of undergraduates.	
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2 **The Relationship Between Spirituality, Health and Life**  
3 **Satisfaction of Undergraduate Students in the UK:**  
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5 **Varun Anand · June Jones · Paramjit S. Gill**

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15 in the health and well-being of undergraduates.

16 **Keywords** Spirituality · Health · Life satisfaction · Well-being · Students  
17

18 **Introduction**

19 Young adults are exploring spirituality (Cavendish et al. 2001) and actively pursuing a  
20 reason for existence; 'there is a desire for belonging and to find purpose in life' (Webber  
21 2001). However, discussions about spirituality remain somewhat taboo in British society  
22 (Hay and Hunt 2000). Recently, there has been an accumulating body of scientific evidence  
23 linking religious involvement with improved health outcomes (Koenig et al. 2001).  
24 Although spirituality overlaps with religion, it is a multidimensional concept with no

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27 consistent definition in the literature (Miller and Thoresen 2003). A recent attempt to  
28 conceptualise spirituality proposed four components, any of which may stand alone: 'Belief  
29 in a domain that goes beyond the material world; *Practice* by way of contemplation,  
30 prayer, reading or reflection; *Awareness* of being moved intellectually and/or emotionally;  
31 and *Experience* that is usually unbidden' (King 2009).

32 The importance of spirituality in patients' end of life care has been recently high-  
33 lighted (Grant et al. 2010). Spiritual quality of life has also recently been shown to make  
34 a significant contribution to assessing quality of life in health (O'Connell and Skevington  
35 2010). Research on spirituality's positive connection to physical and mental health is  
36 beginning to emerge (Larson et al. 1998; Lawler-Row and Elliott 2009; Seybold and Hill  
37 2001). As an increasingly recognised determinant of health (Fleming and Evans 2008),  
38 spirituality is a common coping strategy for patients (NICE Guidance 2004). A literature  
39 review has revealed that the spiritual needs of patients affect health outcomes. Fur-  
40 thermore, there is a strong positive relationship between overall patient satisfaction and  
41 the extent to which staff address patients' emotional and spiritual needs (Clark et al.  
42 2003).

43 However, most of the studies have focused on adults, with little research amongst  
44 students. University is often the place where students discover their purpose in life  
45 (Taylor 2008), suggesting that research into their spirituality could be worthwhile. In  
46 the USA, 80 % of students entering college have an interest in spirituality (Astin et al.  
47 2011). Aspects of the ASPIRES scale, which measures religious sentiments and spiritual  
48 transcendence, have been shown to have causal influences on Axis II characteristics in  
49 two US college student samples (Piedmont et al. 2007). A study in 2000 demonstrated  
50 that personal spirituality amongst undergraduates had a positive impact on the satisfac-  
51 tion with life component of subjective well-being. As participants were sampled  
52 from a private religiously affiliated college, the study is subject to selection bias  
53 (Fabricatore et al. 2000). College students in the USA with higher mean spirituality  
54 scores reported better overall physical health and higher levels of life satisfaction,  
55 although this was only assessed using a single question. Conversely, low self-reported  
56 spirituality predicted risky health behaviours, including tobacco and alcohol consump-  
57 tion (Nelms 2005). Furthermore, a study involving 522 college students showed that  
58 those who described themselves as spiritual or religious were likely to report better self-  
59 perceived health, which in turn influenced life satisfaction. However, White participants  
60 made up over 90 % of the sample, thereby limiting the study's generalisability (Zullig  
61 et al. 2006).

62 Much of the research on spirituality and health has come from a US Judeo-Christian  
63 perspective. There is a gap in the literature when it comes to studies of participants of  
64 different beliefs, with very limited data from the UK. This study explored the rela-  
65 tionship between spirituality and the health and life satisfaction of undergraduate stu-  
66 dents in the UK. Secondary aims examined whether the relationships varied by age,  
67 gender, marital status, ethnicity, year of study, college, religious belief, being a member  
68 of a religious/spiritual society or extracurricular group and/or smoking and alcohol  
69 consumption. As the University of Birmingham has a rich tradition of culturally diverse  
70 students, it provided the perfect platform to explore these relationships in a multifaith  
71 setting. Understanding the role spirituality has in student life would inform managers of  
72 higher education of the potential social and health benefits of incorporating spirituality in  
73 a university setting.



74 **Methods**

75 Design and Participants

76 The study was a cross-sectional online survey conducted between January and April 2010  
77 at the University of Birmingham. Students across all years studying on full-time under-  
78 graduate courses were eligible. Owing to data protection issues, permission was not  
79 granted to randomly select students from the University register. Therefore, for each of the  
80 five University colleges, a subject course was randomly selected. To ensure that all col-  
81 leges were similarly represented, if the selected course had 150 students or less, an  
82 additional course was randomly selected from that college. Courses with less than 100  
83 students were excluded for logistical reasons. The randomly selected courses were as  
84 follows: Ancient History and Music from the College of Arts and Law, Accounting and  
85 Finance and International Business from the College of Social Sciences, Dentistry from the  
86 College of Medical and Dental Sciences, Psychology from the College of Life and  
87 Environmental Sciences and Chemical Engineering and Electronic Engineering from the  
88 College of Engineering and Physical Sciences. This stratified random sampling method  
89 ensured that students represented a wide variety of academic disciplines.

90 Procedure

91 The survey was initially piloted, following which any sources of ambiguity were corrected.  
92 After permission was obtained from the respective programme leads, a total of 2,361  
93 undergraduates received a cover email containing a link to a short online survey. A  
94 reminder email was sent after 2 weeks. Students had an equal time of 2 months to com-  
95 plete the survey after which further entries were excluded. Spirituality was defined using  
96 the National Institute for Health and Clinical Excellence (NICE) definition of spiritual  
97 belief, 'the search for the existential or ultimate meaning in life' that 'may not always be  
98 expressed in a religious way' (NICE Guidance 2004). The two outcome measures were  
99 general health and life satisfaction. Life satisfaction was defined as 'our subjective eval-  
100 uation of the degree to which our most important needs, goals and wishes have been  
101 fulfilled' (Frisch 2006). The BMedSc Population Sciences and Humanities Internal Ethics  
102 Review Committee approved the study.

103 Measures

104 The survey took approximately 5 min to complete and consisted of four sections. 'Intro-  
105 duction' section asked basic demographic details and lifestyle behaviours including reli-  
106 gious/spiritual group membership, participation in an extracurricular group activity and  
107 smoking and alcohol consumption. In 'Methods' section, participants indicated the extent  
108 of their agreement or disagreement with 13 statements on the Spirituality Scale. This short  
109 scale was used to encourage response from students on a potentially uncomfortable subject.  
110 The Spirituality Scale has been used previously amongst a sample of students ( $n = 221$ )  
111 where it demonstrated a high internal consistency reliability estimate ( $\alpha = .96$ ). Conver-  
112 gent validity was demonstrated by the high inter-item correlations ( $r = .32-.81, p < .01$ ).  
113 Discriminant validity was also examined for and proven, supporting the overall construct  
114 validity of the scale (Nelms 2005). The order of the questions was altered slightly to ensure  
115 a clear flow and improve readability.

Author Proof



116 'Results' section assessed students' general health in three ways. The first question rated  
117 their general health from 'very good' to 'very bad' and was based on the proposed question  
118 for the 2011 census (Office for National Statistics 2009). Participants were then asked how  
119 many days over the past month their health was not good. This question was taken from the  
120 Centres for Disease Control and Prevention's Health-Related Quality of Life Scale,  
121 demonstrating good construct validity in a random sample of students (Zullig 2005). A  
122 shortened version of the Cohen–Hoberman Inventory of Physical Symptoms (CHIPS)  
123 asked about the occurrence of nine symptoms on a 4-point Likert scale (Lawler-Row and  
124 Elliott 2009). The CHIPS had good internal reliability in two separate college student  
125 samples ( $\alpha = .88$ ; Cohen and Hoberman 1983). Students were then asked if they had a  
126 chronic medical condition that could explain any of these symptoms. The last section of the  
127 survey was the Brief Multidimensional Students' Life Satisfaction Scale—College version.  
128 Eight dimensions of life satisfaction were assessed on a 7-point Delighted-Terrible scale,  
129 for example, 'I would describe my satisfaction with my family life as...' This scale  
130 recently demonstrated acceptable internal consistency ( $\alpha = .80$ ) and construct validity  
131 amongst 723 students (Zullig et al. 2009).

132 Active measures were taken to improve response in a typically recalcitrant population  
133 (Sax et al. 2003). These included a prize draw, A3 posters, messages on the University's  
134 Web portal, an article in the University's newspaper and messages on the social net-  
135 working website Facebook.

## 136 Statistical Analysis

137 Data were analysed using SPSS Statistics 18.0. First, a descriptive analysis of demo-  
138 graphics was undertaken. The spirituality responses were coded from 1 for 'strongly dis-  
139 agree' to 5 for 'strongly agree'. 'Agree' and 'strongly agree' were combined as were  
140 'disagree' and 'strongly disagree' to enable the proportions in these groups to be compared  
141 using binomial tests. The coded responses were summed into a score out of 65, a higher  
142 score reflecting a higher degree of spirituality. The same was done for the symptoms scale  
143 giving a score out of 36 (higher score meaning better health) and for life satisfaction giving  
144 a score out of 56 (higher score meaning greater life satisfaction).

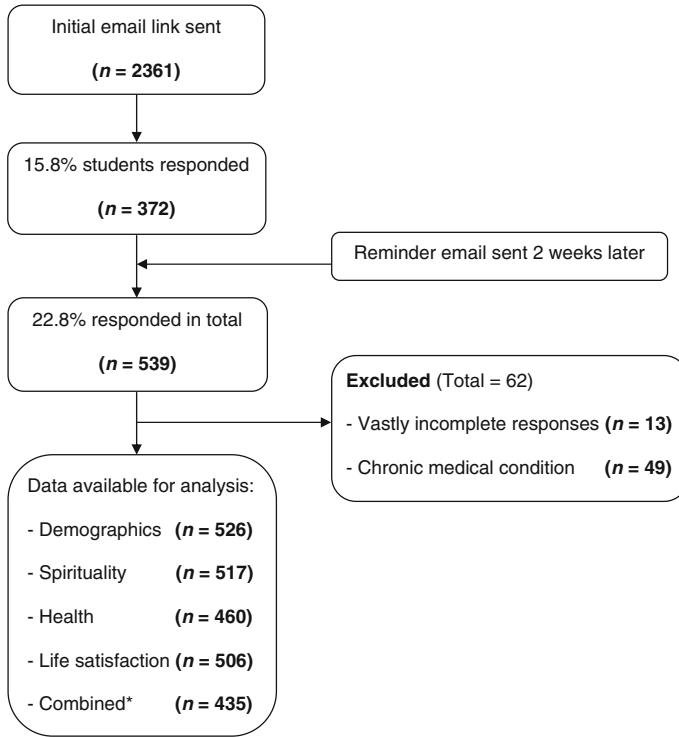
145 If distributions were skewed, they were summarised using median and interquartile  
146 range (IQR), otherwise means and standard deviations were given. Correlation analyses  
147 were undertaken between these three total scores. The normality of the total spirituality,  
148 health and life satisfaction score residuals was assessed. Mean total spirituality scores were  
149 compared across the demographic variables using independent *t* tests and analysis of  
150 variance (ANOVA). Analysis of covariance (ANCOVA) was undertaken to see if any  
151 differences were still present after controlling for total health score and life satisfaction  
152 score. Multivariate regression analyses were conducted with total spirituality score as the  
153 independent variable and total health and life satisfaction score as dependent variables. A  
154 minimum sample size of 204 participants was required for the multiple regression analyses  
155 to demonstrate a medium effect size ( $f^2 = .15$ ) of spirituality on the health and life sat-  
156 isfaction of students with 12 predictors (power = .90,  $\alpha = .01$ ).

## 157 Results

158 The response rate achieved was 23 % (539 out of 2,361), giving the study sufficient power  
159 for the primary research question. From the initial sample of 539, 13 students were



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**Fig. 1** Response flow chart. Asterisk demographic, spirituality, health and life satisfaction responses combined

160 excluded because they only completed ‘Introduction’ section of the survey. Numbers  
 161 completing each section vary slightly as not all participants completed all sections. Ana-  
 162 lysis between sections was conducted with the maximum number of students who had  
 163 completed both sections. Forty-nine participants were excluded from primary analyses  
 164 because they had a chronic medical condition. Where only one item on any scale was  
 165 missing, the mean value was substituted. Analysis was conducted on the complete data set  
 166 and after mean value substitution. If more than one item was missing, the participant was  
 167 excluded. A response flow chart is shown in Fig. 1.

168 Almost 95 % of respondents were aged between 18 and 22 (range 17–62 years). Mean  
 169 age of respondents was similar to that of non-respondents, 20.2 years (SD = 2.5) and  
 170 20.0 years, respectively. Female and White students were overrepresented amongst the  
 171 respondents. Arts and Law students had the highest response, and although response from  
 172 the other colleges appears similar, only 6 % of Accounting and Finance students respon-  
 173 ded. Further data on characteristics of respondents and non-respondents are presented in  
 174 Table 1.

175 Table 2 shows the responses from the Spirituality Scale. Binomial tests were performed,  
 176 and the asterisked items are those where the proportion that agreed or strongly agreed  
 177 significantly differed from the proportion that disagreed or strongly disagreed. Clearly,





**Table 1** Baseline characteristics of respondents and non-respondents

College	Arts and Law	Social Sciences	Medical and Dental Sciences	Life and Environmental Sciences	Engineering and Physical Sciences	Total
<b>Respondents</b>						
<i>n</i>	152 (53.9)	62 (16.2)	77 (16.9))	107 (21.0)	123 (16.8)	526 (22.3)
Mean age (SD)	20.0 (3.6)	20.1 (1.5)	21.1 (1.9)	19.6 (1.2)	20.6 (2.1)	20.3 (2.1)
<b>Gender</b>						
Male	43 (28.5)	20 (32.3)	18 (23.4)	8 (7.5)	80 (65.0)	170 (32.4)
Female	108 (71.5)	42 (67.7)	59 (76.6)	99 (92.5)	43 (35.0)	355 (67.6)
<b>Year of study</b>						
Year 1	56 (36.8)	26 (41.9)	17 (22.1)	52 (48.6)	39 (31.7)	192 (36.5)
Year 2	56 (36.8)	18 (29.0)	11 (14.3)	29 (27.1)	35 (28.5)	149 (28.3)
Year 3	36 (23.7)	11 (17.8)	15 (19.5)	26 (24.3)	33 (26.8)	124 (23.6)
Years 4/5	4 (2.7)	7 (11.3)	34 (44.1)	0	16 (13.0)	61 (11.6)
<b>Ethnicity</b>						
White	137 (90.1)	47 (78.3)	19 (24.7)	86 (80.4)	61 (50.0)	353 (67.5)
Black	1 (0.7)	1 (1.7)	3 (3.9)	3 (2.8)	8 (6.6)	16 (3.1)
Asian	9 (5.9)	11 (18.3)	50 (64.9)	13 (12.1)	45 (36.8)	130 (24.9)
Other	5 (3.3)	1 (1.7)	5 (6.5)	5 (4.7)	8 (6.6)	24 (4.5)
<b>Religious belief</b>						
Christian	53 (34.9)	18 (29.1)	10 (13.0)	36 (33.6)	36 (29.3)	156 (29.7)
Hindu	0	4 (6.5)	14 (18.2)	3 (2.8)	8 (6.5)	29 (5.5)
Muslim	3 (2.0)	1 (1.6)	13 (16.9)	5 (4.7)	16 (13.0)	38 (7.2)
Sikh	2 (1.3)	1 (1.6)	14 (18.2)	2 (1.9)	6 (4.9)	26 (4.9)
Agnostic	40 (26.3)	3 (4.8)	9 (11.7)	17 (15.9)	9 (7.3)	78 (14.8)
Atheist	31 (20.4)	15 (24.2)	6 (7.7)	19 (17.7)	15 (12.2)	86 (16.4)
Other	16 (10.5)	5 (8.0)	7 (9.1)	9 (8.4)	14 (11.4)	51 (9.7)
None	7 (4.6)	15 (24.2)	4 (5.2)	16 (15.0)	19 (15.4)	62 (11.8)



**Table 1** continued

College	Arts and Law	Social Sciences	Medical and Dental Sciences	Life and Environmental Sciences	Engineering and Physical Sciences	Total
Non-respondents						
<i>n</i>	130 (46.1)	320 (83.8)	378 (83.1)	403 (79.0)	609 (83.2)	1,835 (77.7)
Mean age	18.9	19.7	20.8	19.7	20.7	20.0
Gender						
Male	84 (64.1)	192 (60.0)	153 (40.5)	46 (11.4)	477 (77.9)	952 (51.6)
Female	47 (35.9)	128 (40.0)	225 (59.5)	357 (88.6)	135 (22.1)	892 (48.4)
Ethnicity						
White	126 (96.9)	118 (36.9)	83 (22.0)	309 (76.7)	148 (24.3)	784 (42.6)
Black	0	19 (5.9)	7 (1.9)	9 (2.2)	66 (10.8)	101 (5.5)
Asian	0	112 (35.0)	258 (68.3)	55 (13.6)	130 (21.3)	555 (30.2)
Other	0	8 (2.5)	14 (3.7)	13 (3.2)	9 (1.5)	44 (2.4)

Values are number (per cent within college) unless otherwise indicated

Asian includes Indian, Pakistani, Bangladeshi, Chinese and Asian Other

Numbers vary slightly due to missing data for some variables

Non-respondents ethnicity data were incomplete



**Table 2** Responses to Spirituality Scale ( $n = 517$ )

Statement	Disagree/strongly disagree	Neutral	Agree/strongly agree
I am a very spiritual person	39.1 % (202)	27.8 % (144)	33.1 % (171)
I try to be a spiritual person	35.8 % (185)	19.7 % (102)	44.5 % (230)*
My spiritual beliefs help me to be a better person	32.5 % (168)	17.8 % (92)	49.7 % (257)***
My spirituality is at the core of who I am	48.6 % (251)***	22.4 % (116)	29.0 % (150)
My spirituality is my inner voice speaking to me	50.9 % (263)***	21.8 % (113)	27.3 % (141)
I believe god, creator or higher power is present in my life	36.8 % (190)	17.4 % (90)	45.8 % (237)*
My spirituality is my personal connection with god or a higher power	46.0 % (238)**	19.0 % (98)	35.0 % (181)
My spiritual beliefs are the foundation for my religious background	48.4 % (250)***	19.1 % (99)	32.5 % (168)
My spiritual beliefs make my life more meaningful	36.2 % (187)	19.5 % (101)	44.3 % (229)*
I feel as if my life has a higher purpose	35.2 % (182)	23.2 % (120)	41.6 % (215)
My spiritual beliefs guide my relationships with other people	45.7 % (236)***	23.4 % (121)	30.9 % (160)
I would feel lost without my spiritual beliefs directing my life	51.6 % (267)***	20.7 % (107)	27.7 % (143)
My spiritual beliefs positively impact my health and well-being	37.3 % (193)	23.4 % (121)	39.3 % (203)

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

178 elements of spirituality are playing some part in the lives of students, for example, in terms  
 179 of helping them to be 'a better person' and imparting more meaning in life.

180 The mean total spirituality score was 37.3 (SD = 14.6, range 13–65,  $n = 517$ , coefficient  
 181 of skewness =  $-.053$ , standard error =  $.117$ ). Total health score was negatively  
 182 skewed (coefficient of skewness =  $-.757$ , standard error =  $.114$ ) with a median score of  
 183 31 (IQR = 7, range 15–36,  $n = 460$ ) as was total life satisfaction score (coefficient of  
 184 skewness =  $-.731$ , standard error =  $.109$ ) with a median score of 43 (IQR = 10, range  
 185 13–56,  $n = 505$ ).

186 A  $t$  test revealed that students who drank alcohol had lower levels of spirituality  
 187 ( $M = 34.4$ ;  $SD = 13.7$ ) than those who did not ( $M = 45.7$ ;  $SD = 14.1$ ),  $t(515) = -8.23$ ,  
 188  $p < .0001$ . In addition, a Spearman's correlation revealed that alcohol consumption was  
 189 significantly negatively correlated with total spirituality score ( $r = -.313$ ,  $p < .0001$ ,  
 190  $n = 379$ ). There were no significant differences in total spirituality scores between male  
 191 and female students, students who were part of an extracurricular group activity and those  
 192 who were not and students who smoked compared with those who did not.

193 In order to investigate differences in levels of spirituality across the demographic vari-  
 194 ables, a one-way ANOVA was performed with total spirituality score as the dependent



**Table 3** Comparison of total spirituality scores across a set of demographic variables

Variables	<i>M</i>	<i>SD</i>	<i>n</i>
<b>Marital status</b>			
Single	38.8	14.8	328
In a relationship	33.9	13.7	178
Married	51.7	17.4	7
Divorced	39.5	6.4	2
<b>College</b>			
Arts and Law	36.0	13.8	150
Social Sciences	35.4	11.9	60
Medical and Dental Sciences	44.4	15.3	75
Life and Environmental Sciences	33.7	14.2	106
Engineering and Physical Sciences	38.6	15.2	121
<b>Ethnicity</b>			
White	33.1	13.5	345
Indian	46.1	13.8	70
Pakistani	52.7	8.8	17
Chinese	36.1	12.3	28
Black	52.9	7.8	16
Other	46.6	12.6	38
<b>Religious belief</b>			
Christian	44.7	12.2	153
Hindu	45.8	11.7	29
Muslim	51.9	9.6	38
Sikh	51.6	8.0	25
Agnostic	30.5	9.4	76
Atheist	22.2	9.2	85
Other	38.3	11.4	50
None	28.6	11.2	61

195 variable. Table 3 displays the means and standard deviations. There was a statistically sig-  
 196 nificant difference in mean total spirituality score between students from the five colleges,  
 197  $F(4,507) = 7.15, p < .0001 (\eta^2 = .05)$ . Hochberg's GT2 post hoc test revealed that Den-  
 198 tistry students had significantly higher spirituality ( $M = 44.4$ ;  $SD = 15.3$ ) than Arts and Law  
 199 students, Social Sciences students and Psychology students ( $p < .05$ ). Spirituality score was  
 200 significantly different between students of different ethnicities,  $F(5,508) = 26.50, p < .0001$   
 201 ( $\eta^2 = .21$ ). White students had the lowest spirituality ( $M = 33.1$ ;  $SD = 13.4$ ), and Hoch-  
 202 berg's GT2 test indicated that this was significantly different from Black students ( $p < .05$ ),  
 203 who had the highest spirituality ( $M = 52.9$ ;  $SD = 7.8$ ). Pakistani students had a similar high  
 204 level of spirituality ( $M = 52.7$ ;  $SD = 8.8$ ), but these results must be read with caution  
 205 because of the differences in numbers between the ethnic groups (see Table 3). Lastly, there  
 206 were also significant differences in spirituality between different religious groups,  
 207  $F(7,509) = 63.52, p < .0001 (\eta^2 = .47)$ . Muslim students had the highest level of spiritu-  
 208 ality ( $M = 51.9$ ;  $SD = 9.6$ ), and Hochberg's GT2 test revealed that this was significantly  
 209 different from all other students ( $p < .05$ ) except for Sikhs and Hindus who had the second  
 210 and third highest spirituality scores, respectively. Mean total spirituality scores were also



211 significantly different for students of different marital status but not significantly different for  
212 students in different years, with different levels of general health or with different numbers of  
213 days that their health was not good.

214 After controlling for mean total health score and life satisfaction score using ANCOVA,  
215 all the significant differences in mean total spirituality score were still present. Had  
216 Bonferroni corrections been applied to the ANOVAs and ANCOVAs, all but one of the  
217 results would have remained statistically significant. Only differences in spirituality  
218 between students of different marital status would not have remained significant, sug-  
219 gesting that this may be a chance finding.

220 The study was designed to identify whether there was a reported relationship between  
221 spirituality, health and life satisfaction of undergraduates. Spearman's correlation analysis  
222 revealed weak correlations between total spirituality score and health score ( $r = -.051$ ,  
223  $p = .252$ ,  $n = 501$ ) and between total spirituality score and life satisfaction score  
224 ( $r = .019$ ,  $p = .681$ ,  $n = 496$ ). The health score was divided into two groups; participants  
225 with a score of 31 (the median value) and above were classified as having high health score  
226 and those below 31 as having low health score. Binary logistic regression using the forward  
227 stepwise method showed that total spirituality score was not a significant predictor  
228 ( $p = .282$ ) of health score. The model, which included total life satisfaction score,  
229 accounted for 23.9 % of variance (Nagelkerke  $R^2 = .239$ ) and correctly classified 69 % of  
230 participants as having high or low health score using a cut-off value of .5.

231 Total spirituality score was also not a significant predictor ( $p = .371$ ) of life satisfaction  
232 score in the multiple linear regression analysis using the forward method. The model,  
233 which included total health score, predicted 31.1 % of the variance in life satisfaction  
234 ( $R^2 = .311$ ). For both regression analyses, the following factors were considered as  
235 potential covariates but were not all selected by the regression process: age, gender, year of  
236 study, course, college, ethnicity, religious belief, marital status, member of a religious/  
237 spiritual group, part of extracurricular group, do you smoke, smoking consumption, do you  
238 drink alcohol and alcohol consumption. Including the students who had a chronic medical  
239 condition did not alter the results and neither did missing value substitution.

## 240 Discussion

241 This is the first study to report on student spirituality in the UK. The data did not reveal a  
242 significant relationship between undergraduates' spirituality, health and life satisfaction.  
243 This is contrary to most previous research. Although a US study did show a significant  
244 positive relationship between spirituality and health, a convenience sample of students was  
245 used, selected from only one course (Nelms 2005). Conversely, this present study had a  
246 large sample of undergraduates representing students from across the university. Fur-  
247 thermore, the majority of students rated their health as 'good' or 'very good' over the past  
248 month and over 75 % reported as being 'satisfied', 'pleased' or 'delighted' with their  
249 overall life. Therefore, the little variation present may not have been enough to elicit  
250 significant relationships. This was also true for a similar study in the USA (Nagel and  
251 Sgoutas-Emch 2007).

252 However, many students view spirituality in a positive light and consider it an important  
253 issue, for example, by adding meaning to their lives. The fact that a third of students  
254 reported being very spiritual but nearly half reported trying to be spiritual implies a certain  
255 desire for spirituality, perhaps as something they would wish to explore or as a worthy  
256 aspiration. It could be argued that this is sufficient evidence to encourage universities to



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257 incorporate spirituality more into campus life. A US longitudinal study by the Higher  
258 Education Research Institute has demonstrated that university can enhance students'  
259 academic skills by providing more opportunities to connect with their inner lives, for  
260 example, by meditation and self-reflection (Astin et al. 2011).

261 Students who do not drink alcohol had higher levels of spirituality than those who do,  
262 and as alcohol consumption increases, students' level of spirituality decreases. This is  
263 consistent with previous literature (Nelms 2005; Nagel and Sgoutas-Emch 2007). As  
264 spirituality is related to religion (Miller and Thoresen 2003) and some religions prohibit or  
265 discourage the consumption of alcohol, this is perhaps not a surprise finding. On the other  
266 hand, smoking did not correlate with spirituality level. As with the case for a previous  
267 study, the low rates of smoking in this sample probably explain this finding (Nagel and  
268 Sgoutas-Emch 2007).

269 Dentistry students had the highest level of spirituality. This can be explained by the fact  
270 that over 50 % of Dentistry students were Muslim, Sikh or Hindu, and students of these  
271 faiths had the highest levels of spirituality amongst the religions. It is interesting to note  
272 that for reasons that are uncertain, Psychology students from the College of Life and  
273 Environmental Sciences had the lowest level of spirituality. Amongst the ethnicities, Black  
274 students had the highest spirituality and White students had the lowest. This is in line with  
275 US literature where African American students have been shown to have higher levels of  
276 spirituality compared with White students (Nelms 2005). As White students were over-  
277 represented amongst the respondents and had the lowest spirituality, this could explain the  
278 relatively low mean total spirituality score.

279 Response bias could have occurred in favour of students who were more spiritual.  
280 However, if this was the case, the courses with the highest response rates would have had a  
281 greater spirituality score. Response rates between courses varied from 6 to 61 %, and there  
282 was no relationship between course response rate and spirituality score. Therefore, it is  
283 likely that response bias did not occur; it may have been eliminated by the attractive prizes  
284 offered in the prize draw.

285 This study has several limitations. The brief 13-item Spirituality Scale used may not  
286 have incorporated everyone's understanding of spirituality. Indeed, as the scale was taken  
287 from a US study, the questions may not be entirely generalisable to a UK population. For  
288 example, most of the questions are framed from a religious perspective and are positively  
289 phrased. A mixed-methods approach may be required to fully appreciate different per-  
290 ceptions of spirituality.

291 Although the study's response rate appears to be low (23 %), a national survey of first-  
292 year students that compared response rates by mode of administration revealed that the  
293 online survey method achieved the lowest response rate at 17.1 % (Sax et al. 2003).  
294 Despite respondents and non-respondents differing slightly in terms of gender, indicating a  
295 possible lack of generalisability to the male population, they were similar in terms of mean  
296 age. Furthermore, the percentage of respondents who belonged to a religion (57 %) was  
297 exactly the same as that of the British public in 2008, as quoted by the recent British Social  
298 Attitudes Survey (National Centre for Social Research 2010).

299 The use of self-reported measures of health is a limitation of the study, but it would  
300 have been impractical, time consuming and potentially unethical to obtain objective  
301 records. It could also be argued that a personal perception of one's health is just as  
302 important if not more important than one's actual physical health. Lastly, as with all cross-  
303 sectional studies, any relationships observed cannot be considered causal.

304 There is a need for further research in the area of students' spirituality and health.  
305 Multicentre longitudinal studies should be undertaken to ascertain causal relationships as



306 to whether or not including spirituality into one's life as a young adult has beneficial health  
307 and life satisfaction outcomes in the future. This research could lead to health promotion  
308 strategies in a university setting by embedding elements of spirituality that are protective to  
309 health.

310 Further research may also inform general practitioners in the UK of the potential  
311 influence of spirituality on students' health and well-being. In terms of patient care, the  
312 General Medical Council has recognised that in the diagnosis and management of patients,  
313 doctors should appreciate the importance of spiritual factors (General Medical Council  
314 2009) and as far as NICE are concerned, we should ensure 'that spiritual elements of illness  
315 are taken into account' (NICE Guidance 2004).

316 This initial study has identified a desire for spirituality amongst UK undergraduate  
317 students. There is an indication that universities have a role to play in supporting students'  
318 search for meaning and purpose as they prepare themselves for the challenges ahead. This  
319 could be achieved by offering impartial workshops as an opportunity to discuss existential  
320 topics, including spirituality in issues to do with student support and welfare and increasing  
321 the awareness of faith societies on campus.

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