

Religiosity, Anxiety and Depression among Israeli Medical Students

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ABSTRACT: **Background:** Religiosity has been examined as a mechanism of stress management. Since many studies have shown a high rate of psychological morbidity among medical students during different stages of training, it is important to investigate whether religiosity may serve as a protective factor.

Objectives: To assess the association between religiosity and depression or anxiety in a sample of medical students and to compare the results with a matched sample of students from other fields of study.

Methods: This cross-sectional study examined a sample of Tel Aviv University medical students and compared them with students in other faculties at the same university for any association between religiosity and depression or anxiety. The subjects completed the Beck Depression Inventory, the Beck Anxiety Inventory, a modified religiosity inventory, and a demographic and psychosocial variables inventory.

Results: Findings did not show a significant association between religiosity and depression or anxiety in the general sample ($n=119$). A positive significant correlation between religiosity and anxiety was found among medical students, with 29.4% of them reporting anxiety and 25.2% depression. While high rates of depression and anxiety were reported by students in the first to third years (preclinical years), there was a decrease in depression and anxiety in the fourth to sixth years (clinical years). However, higher anxiety and depression scores were noted among controls as compared to medical students.

Conclusions: In contrast to another recent investigation, a negative correlation between religion and depression/anxiety does not necessarily exist. An association between religiosity and mental health could have many theoretical and practical implications and requires further investigation. Similar to previous studies, the rates of depression and anxiety among Israeli medical students were comparable with those of other countries. These rates are considered higher than those in the general population and emphasize the importance of alertness to mental health issues among students, especially during the early study years.

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There is increasing interest in the general public and the medical community regarding the role of religion in physical and mental health [1]. Despite the historical sentiment of many psychiatrists regarding the association between religion and mental health, this view has recently been challenged [2]. Studies have found a positive association between religiosity and mental health, including less depression and faster recovery from depression, decrease in anxiety, lower suicide rate, and decrease in alcohol and drug abuse [2]. Furthermore, religiosity has been associated with general psychological well-being, including a state of happiness, a sense of satisfaction, hope, optimism, a sense of meaning in life, satisfaction in marriage, general stability and social support [2,3]. These findings appear to be more prominent among people facing stress in their lives, such as the elderly and those suffering from disability or disease [2,3].

In addition, studies that assumed religiosity may have a positive impact on physical health through a reduction in stress level and increased social support found a positive association between religiosity and several variables such as enhanced immune system function, lower cancer mortality rates, decreased cardiac morbidity, lower blood pressure and cholesterol levels, and healthier lifestyle including physical activity and less smoking [2,3]. In contrast, some studies have shown a negative association between religiosity and mental health [4], which includes “religious strain” – expressed mostly as feelings of guilt and alienation and associated with higher levels of depression and suicide, irrespective of the reported comfort found in religion [5]. Other authors have claimed that evidence relating religion to medicine is weak and unconvincing since it is based on studies with problematic methodology, conflicting results and data lacking specificity [1].

More specifically, the relationship of depression and anxiety to religion has been explored with the common assumption that the association is a positive, albeit weak, effect with consistency among various age, gender and ethnicity groups [6]. The association between religion and anxiety is even less clear, with some studies showing a positive effect and others a negative effect [7]. Notably, most studies regarding religiosity have been conducted among Christian communities in the United States and many among sick and elderly subgroups [1,8].

A more recent study from Iran [9] explored the association of religiosity with anxiety and depression variables in a sample of 285 fourth year medical students at the University of Teheran. The results of the study showed a significant association of "religious belief" score and "total religiosity" score with lower levels of anxiety. The association between these variables and low levels of depression reached a tendency to statistical significance. Their findings, claim the researchers, support the hypothesis that religion can be a protective factor against depression and anxiety. This is an important study since the data indicating a high incidence of psychiatric morbidity among medical students are substantial [10,11]. The prevalence of depression has even been shown by some to increase over the period of medical studies and to be higher in females than males [12,13].

Psychological distress has ramifications in the behavioral, cognitive and emotional areas of the student's life, such as academic functioning, cynical attitude, decreased empathy for patients, and drug use [11]. The high suicide rate among physicians may reflect the consequence of untreated depression [14].

Since depression and anxiety among medical students have such an obvious negative effect on function in medical school and later in clinical practice, it is important to focus on the extent and severity of the problem, its causes, and potential factors that may alleviate or protect against the phenomenon [15]. Thus the primary objective of the current study was to assess the association of religion with depression and anxiety in a sample of medical students in another Middle Eastern country, Israel, compared with a sample of students from other fields of study.

SUBJECTS AND METHODS

A specially designed package of questionnaires (see below) was presented to medical students in all 6 years of study at a medical school in central Israel. In addition, a control sample of approximate age and gender-matched students from other university faculties was recruited. Participants were requested to complete the questionnaires anonymously and to deposit them in a sealed envelope in a designated box. The study was approved by the Beer Yaakov Mental Health Center Helsinki Committee Ethical Review Board.

STUDY MEASUREMENTS

The students who volunteered to participate in the study received questionnaires including the Beck Anxiety and Depression Inventories, a questionnaire on religiosity, and questions about psychosocial and demographic variables.

- **Depression** was measured using a Hebrew version of the Beck Depression Inventory-II. A cutoff point of 10 and

above was used for detection of depression in the sample of high functioning students

- **Anxiety** was measured using a Hebrew version of the Beck Anxiety Inventory. A cutoff point of 10 and above was used for detection of anxiety in the sample of high functioning students
- **Religiosity** was measured using a religiosity questionnaire based on a questionnaire from a recent study that similarly examined the association of religiosity with depression and anxiety among medical students in Iran [9]. The questionnaire (available on request) was translated into Hebrew and adapted to a Jewish population. This self-report questionnaire consists of 15 items and evaluates 3 dimensions of religiosity: religious beliefs (items 2,3,13,14,18), religious emotions (items 1,6,7,12,15) and religious behaviors (items 4,5,9,10,11). A reliability analysis of the questionnaire showed Cronbach's alpha to be 0.92. Bivariate correlations were performed between religiosity factors and the total score. The correlations indicated high associations between the factors (all r values > 0.62 , all P values < 0.001) as well as between the factors and the total score (all r values > 0.88 , all P values < 0.001). These outcomes indicate that the factors are dependent and therefore there is no reason to look at each factor rather than at the combined total score.

- **Psychosocial demographics.** This questionnaire included the following variables: age, gender, marital status, academic year, personal history of depression, family history (first degree) of depression, the presence of important physical or psychiatric illnesses (other than depression), presence of any important socioeconomic problem during the last month, and substance abuse.

STATISTICAL ANALYSIS

Data analysis was performed using SPSS software (16.0 version). Routine sample descriptive statistics were applied to the data. Dependence between variables was tested using the Pearson and the point-biserial correlation coefficients and 2 x 2 chi-square tests. Gender differences were analyzed using *t*-tests. Associations of faculty with anxiety and depression categorical scores were performed using logistic regression models. At the first stage, bivariate analyses were performed to identify significant predictors of anxiety and depression. The following background psychosocial and demographic variables were tested in the bivariate models: gender, age, marital status, past depression, family depression, additional psychiatric or physical problems, drug use, and socioeconomic distress. At the second stage, adjusted models were used to control for possible confounders. The criterion for variables to be added to the final model was an association at a significance level of $P \leq 0.1$. A conditional stepwise method was used to select the significant predictors. Odds ratios and 95% confidence intervals were calculated.

RESULTS

The sample included 170 subjects (100 males and 70 females): 119 medical students and 51 controls (19 in humanities and 32 in exact sciences) in their first to sixth year of university studies (mean 2.6, SD 1.5 years). Age ranged between 18 and 37 years (mean 24.6, SD 3.2 years). Nineteen were married.

Associations between group and background variables were performed. Gender segregation did not differ between groups ($P = 0.7$). Medical students were slightly older than controls (25.1 ± 2.8 vs. 23.5 ± 3.7 years respectively) ($t = 3.2$, $df = 168$, $P < 0.01$). Marital status differed between groups since a greater proportion of medical students were married compared to controls (15% vs. 2%) ($\chi^2 = 6.2$, $df = 1$, $P = 0.01$). Drug use, mainly cannabis, was reported by 22 subjects (13.1%) with a higher rate among controls (21.6%) compared to medical students (9.4%) ($\chi^2 = 4.6$, $df = 1$, $P = 0.03$).

RATING SCALES

- Anxiety and Depression**

The answers given by each respondent on the depression and anxiety scales were summed up and are presented in Tables 1 and 2. Higher anxiety and depression scores were noted in controls compared to medical students ($t = 3.1$, $df = 65.8$, $P < 0.01$; $t = 3.1$, $df = 67.4$, $P < 0.01$, respectively). Figure 1 presents the differences between the groups in mean depression and anxiety scores. Anxiety and depression scores were further analyzed using the clinical cutoff point. The rate of positive scores was higher among controls than among medical students in both anxiety and depression ($\chi^2 = 7.2$, $df = 1$, $P < 0.01$; $\chi^2 = 12.3$, $df = 1$, $P < 0.001$, respectively). t -tests showed no difference between the total religious scores of medical students and controls. t -tests showed lower scores of anxiety and depression in students in the clinical years (years 4–6) (mean 5.5, SD 5.9; mean 5.4, SD 4.8, respectively) compared with students in the preclinical years (years 1–3) (mean 8.6, SD 7.1; mean 7.6, SD 6.9 respectively) among medical students ($t = 1.8$, $df = 117$, $P = 0.07$; $t = 2.5$, $df = 117$, $P = 0.01$, respectively) [Figure 2].

- Religion and anxiety/depression**

Bivariate associations between religiosity and anxiety or depression in the total sample were not significant ($r = 0.07$, $P = 0.36$; $r = 0.02$, $P = 0.80$, respectively). A positive correlation was found between religiosity and anxiety in the medical student sample ($r = 0.24$, $P < 0.01$). Associations between type of faculty and anxiety or depression categorical scores were performed using logistic regression models. A significant association was found between faculty and anxiety (OR = 0.40, 95% CI = 0.20–0.78) and between faculty and depression (OR = 0.30, 95% CI = 0.15–0.60), indicating a lower rate of anxiety and depression in the medical student sample.

OR = odds ratio

CI = confidence interval

Table 1. Averages, SD and t values of anxiety and depression scores in the total sample and the different groups

	Total sample	Medical students	Other students	t (df)
	M (SD) (N=170)	M (SD) (N=119)	M (SD) (N=51)	
Anxiety	9.0 (8.7)	7.5 (6.8)	12.7 (11.3)	3.1 (65.8)*
Depression	8.2 (7.8)	6.8 (6.2)	11.5 (9.95)	3.1 (67.4)*

* $P < 0.01$

Table 2. Averages and χ^2 values of depression and anxiety scores according to clinical cutoff in the total sample and the different groups

	Total sample	Medical students	Other students	χ^2 (df=1)
	% (N)	% (N)	% (N)	
Anxiety	35.9% (61)	29.4% (35)	51.0% (26)	7.2*
Depression	33.5% (57)	25.2% (30)	52.9% (27)	12.3*

* $P < 0.01$

Figure 1. Differences in depression and anxiety scores between the groups

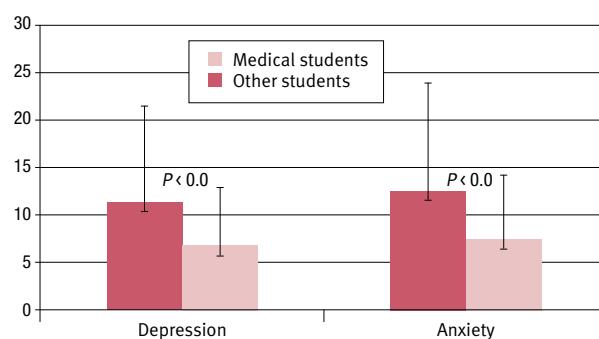
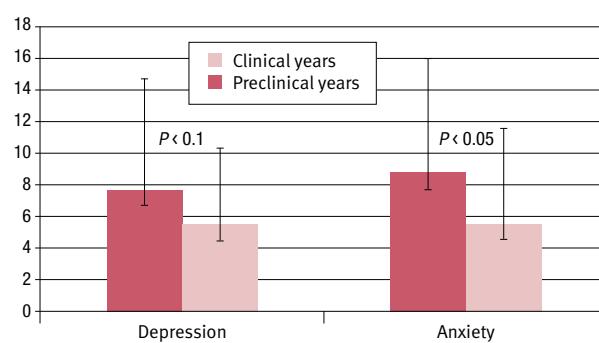


Figure 2. Differences in depression and anxiety scores in medical student's preclinical and clinical years



The final model of anxiety included the following predictors: faculty, religiosity, gender, past depression, family history of depression, and socioeconomic distress. The final model included the following significant variables: faculty (OR = 0.44, 95% CI = 0.21–0.90), indicating a reduced risk for anxiety

among medical students, and family history of depression (OR = 2.76, 95% CI = 1.01–7.60) due to increased risk for subjects with depression in first-degree relatives. The final model of depression included the following predictors: group, gender, marital status, past depression, family history of depression, and socioeconomic distress. The final model included the following significant variables: faculty (OR = 0.32, 95% CI = 0.15–0.69), indicating a reduced risk for depression among medical students. Additional significant predictors were gender (OR = 2.64, 95% CI = 1.23–5.70) due to greater risk for women, past depression (OR = 4.19, 95% CI = 1.88–8.69) due to increased risk for subjects with past depression, and socioeconomic distress (OR = 3.62, 95% CI = 1.14–11.46) due to increased risk for subjects reporting on socioeconomic distress.

DISCUSSION

We did not find a significant association between religiosity and anxiety or depression in the overall sample. The results are consistent with previous findings that show no association between religion and psychiatric morbidity [3], but are inconsistent with other findings that do show some association between these variables [9,16,17]. These contradictions can be explained by examining the characteristics and different emphasis of the studies. For example, when examining psychiatric morbidity, a different emphasis is given to psychiatric disorders versus psychological well-being. Whereas many studies found an association between religious activity and lower rate of psychological distress [18], and other studies stress the importance of religion in coping with stressful life events [19], only a few studies actually found an association between religiosity and psychiatric disorders [20].

Social psychology studies examining different aspects of personality and social functioning, but not psychiatric disorders, found a negative association between religious involvement and problems of social conduct, alcohol and substance use [16], and a positive association with a sense of self-esteem, family cohesiveness and self-perceived well-being [2]. Therefore, it may be suggested that a healthy lifestyle is one of the effects of religion protecting against psychiatric morbidity [4].

The present study examined the current level of religiosity rather than a lifetime pattern of religiosity. This may have affected to some extent the association between religiosity and mental disorders. A change in the pattern of religious activity may be a marker of psychological distress; conversely, psychiatric issues can cause a decrease in such activity in religious communities [20]. Furthermore, religiosity is a complex and multi-dimensional concept and studies that are undertaken focus on different dimensions of religiosity. When religiosity is broken down into specific variables, interesting associations are found between these variables and psychiatric morbidity. When examining religiosity as "organizational

religiosity" (public activity related to religiosity), some studies have shown an inverse association between religiosity and depression [19]. Furthermore, belonging to a religious community has been positively associated with better health measures and counterbalances the negative effect of recent life events [21]. Nevertheless, there is evidence that participation, formally or informally, in different social groups, religious or non-religious, may itself have a positive effect on health and reduces psychological distress [22]. However, studies have found no association between "subjective/private religiosity" (individual religiosity that does not include public participation in religious organizations and rituals) and depression or psychopathology [19–21].

Our findings show a significant positive, however moderate, association between religiosity and anxiety among medical students. It appears therefore, at least in this study sample, that religion does not necessarily have a 'calming effect' on medical students exposed to, and required to cope with, illness and death in their studies.

Studies that examined "religious coping" found that different religious coping mechanisms affect mental health in different ways. Positive forms of religious coping include searching for spiritual support from a deity and the community, a sense of meaning and forgiveness, as opposed to negative forms of religious coping that include a passive attitude that deflects responsibility to a higher power, anger, difficulty forgiving a deity, and viewing negative events as divine punishment. Positive forms of religious coping are associated with less depression, anxiety and psychological stress, and better coping with stressful life events, whereas negative forms of religious coping are associated with opposite outcomes [7].

Finally, there are methodological differences between studies that affect the findings. These include differences in sample size and demographic characteristics of sample groups (most studies were carried out in the United States and in older Christian populations [1,8], in contrast to this study sample population), lack of a uniform measure of the "religiosity" variable, and the use of self-report questionnaires that tend to overestimate religiosity level [4]. Thus it cannot be concluded that religiosity itself is protective of depression or anxiety. Rather, many factors associated with social and personality characteristics and their integration must be considered as well.

In the current study 29.4% of the students were anxious and 25.2% were depressed. These findings are in line with previous findings from studies of medical students in the USA [14]. A systematic review of studies from the USA and Canada show a higher level of distress among medical students compared with a general age-matched population; however, it remains inconclusive whether this distress is higher or lower than among other students [11]. In fact, very few studies have compared subjective depression and anxiety between medical students and other students. Interestingly, in this study, stu-

dents from other faculties reported a significant higher rate of depression and anxiety than did medical students. These findings are consistent with findings of a study in the USA where medical students reported less distress, depression and anxiety compared with law students [23], but are inconsistent with a Turkish study that found a higher rate of distress among second year medical students than among commerce and physical education students [13]. These differences in findings can be explained by differences in sample size, timing of questionnaire completion with regard to the academic year, and specific faculties selected for the comparison group.

Similar to previous studies, this study showed a higher level of anxiety and depression among medical students in the preclinical years (years 1–3), with a decrease in the clinical years (years 4–6) [24]. It has been suggested that this finding can be attributed to the influence of multiple stress factors in the first year of medical school [15]. However, most studies of this nature are cross-sectional, while longitudinal studies are ideally required to establish the nature of depression and distress over the course of medical studies.

It also remains unclear whether the training process in medical school is causally associated with depression, or that there are more students predisposed to depression among candidates for medical school [10,24]. A study examining the rate of depression among students prior to the beginning of the first year of medical school compared with the rate during medical school showed a significant increase in depression during medical school studies [12,24]. On the other hand, one study found that two-thirds of depressed medical students reported a history of past depression and almost a half reported a family history of depression [10].

Limitations of the study include its cross-sectional nature and the fact that only one medical school was represented. In addition, the study population consisted of volunteers and it is difficult to know precisely how representative they were of the student body as a whole. Similar to other studies of such a nature, depression and anxiety may have been underestimated in this study due to non-responder bias, as studies have shown that non-responders are more depressed than volunteers [25]. Furthermore, the study variables were measured by self-report questionnaires, which do not allow diagnostic conclusions since there was no secondary screening such as a clinical interview. We chose a relatively low cutoff score for the definition of depression and thereby may have increased the false positive diagnosis. Since the study is not prospective, no causal association can be declared between religiosity and depression or anxiety. Finally, the study did not explore whether depressed or anxious students sought professional help. This would be important in future studies since some studies have reported a low rate of treatment by mental health services among medical students, despite psychological distress and even suicidal ideation [14,15,23].

This study's findings are important for medical educators. Psychological distress, depression and anxiety may accompany the students later in life and in clinical practice and may thus adversely influence the quality of medical care [15]. However, it appears – at least from the results of this study – that religious behavior is not necessarily protective against depression and anxiety in this population of medical students. Physicians should be cautious before recommending religious activity as the only way of providing comfort during periods of emotional stress and difficulty. Students should be educated as early as the first year about the manifestations of depression and anxiety and the importance of early treatment [14]. Behavioral medicine courses can be a natural platform for this purpose [24]. It may also be important to screen for these disorders and encourage confidential use of student psychological counseling services. Considering the scale of the problem, further studies are required to further describe, understand and manage the phenomenon.

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