# Religion and Physical Health among Older Israeli Jews: Findings from the SHARE-Israel Study

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**ABSTRACT:** **Background:** Despite decades of research on religious determinants of health, this subject has not been systematically investigated within Jewish populations, in Israel or the diaspora. The present paper is part of a series of studies using large-scale population data sources to map the impact of religiousness on the physical and mental health of Jews.

**Objectives:** To identify religious predictors of physical health in a national probability sample of older Israeli Jews.

**Methods:** The data derive from the Israeli sample of the Survey of Health, Ageing and Retirement in Europe (SHARE), a cross-national survey program involving nearly a dozen nations. The Israeli sample comprises 1287 Jewish respondents aged 50 or over. Outcome measures include single-item assessments of self-rated health, long-term health problems, and activity limitation, as well as validated measures of diagnosed chronic diseases, physical symptoms, and activities of daily living (ADL) and instrumental ADL (IADL).

**Results:** Recent synagogue attendance is a significant predictor of better health for six of the seven health measures, even after adjusting for age and several other covariates and mediators, including measures of health-related behavior and social support. Prayer, by contrast, is inversely associated with health according to five measures, perhaps reflecting its use as a coping mechanism for individuals with health problems.

**Conclusions:** This study presents modest evidence of a salutary effect of Jewish religiousness on this population of older adults. Religiousness, in the form of synagogue participation, was seen to serve a protective function, and prayer a coping function.

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**KEY WORDS:** health, religion, Jews, Israel, age

Over the past three decades the study of religious influences on health has flourished. In fact, empirical research dates back over a century, but in the past decade growth has been exponential. It is estimated that several thousand studies and scholarly papers have been published on the subject [1]. The majority has focused on older adults [2].

While this literature encompasses studies on every major faith, there is a relative paucity of research among Jews, in Israel or the diaspora. This is not the case regarding mental health [3], with research conducted in Israel, Britain and the United States, but the issue of physical health has been neglected. A handful of studies appeared in the 1980s and 1990s [4-6], but since these were limited assessments of health status and of religiousness, generalizations about a possible protective effect of religion cannot be made easily.

In recent years studies have been conducted in Israel [7,8] and the Jewish diaspora [9,10], including focused research in specialized populations such as medical students [11]. However, with exceptions [9,10], this research did not draw on large population-based samples that enable the study of other religions. In large-scale social or health surveys outside of Israel, based on data from national probability samples, there are proportionally too few Jews for data analyses focusing on Jewish respondents, whether relating to their health, religiousness, or anything else.

In social or epidemiological research, especially on such a contentious topic as religion, there is also a need to sufficiently account for potential mediating or confounding factors in the exposure-outcome relationship [12]. In other words, investigators are burdened with identifying the "how" or "why" of a possible religion-health connection and not solely the "what." This entails not just identifying statistically significant associations between religious measures and health indicators, but adjusting for the effects of factors that may help to explain or elucidate positive findings. In previous research in other populations, this has included health-related behavior, social support, and other psychosocial concepts, as well as sociodemographic characteristics associated with both religion and health. Accordingly, such measures are typically included in statistical analyses, but that depends on access to large population surveys investigating such subjects. This is another benefit of large probability studies and thus also underscores why Jewish research has lagged.

As a remedy, an effort has begun using multiple probability samples with a national or multinational scope in which there are sufficient Jewish respondents and requisite measures. To date, published studies report on religious predictors of various outcomes in several Jewish populations: namely, self-ratings

of health using data from the U.S. National Jewish Population Survey [10], positive well-being within the Israeli sample and a combined diaspora sample from the World Values Survey [13], as well as psychological well-being and distress from the Israeli sample of the Gallup World Poll [14]. While religious measures are limited in these samples and few physical or mental health outcomes are available, these deficiencies are outweighed by an ability to generalize to the population and adjust for covariates.

The present study continues this effort, drawing on data from the Israeli sample of the Survey of Health, Ageing and Retirement in Europe (SHARE) (see description in Methods, below). While the religious measures here are not ideal, a cornucopia of physical and mental health variables and indices is available. In this study, the three available religious indicators (past-month synagogue activities, current prayer, and having received a religious education in childhood) are examined in relation to seven physical health outcomes: single-item measures of self-rated health, long-term health problems, and activity limitation, and scales of diagnosed chronic diseases, physical symptoms, activities of daily living, and instrumental activities of daily living. This is the widest array of health measures examined in one study in the literature on religion and health.

It is hypothesized that synagogue participation is associated with better health. This may be due to healthy behavior and to tangible and emotional benefits of social support. Participation in congregational life can be a source of help during times of trouble and one's fellow congregants can provide friendship and other social or interpersonal resources that may affect health significantly [15]. Prayer, by contrast, is hypothesized to be inversely associated with health, due perhaps to its use as a coping mechanism for challenges such as ill health or age-related declines in physical function [16]; that is, people in ill health turn to prayer more so than people who are well, on average. If so, then poorer health may lead to greater or more frequent prayer, resulting in an inverse statistical association between prayer and health. The recency of praying as assessed in the SHARE study ("the present," see below), contrasted with the more retrospective scope of some of the health measures (past 3 months, past 6 months, "long-term," ever) supports this expectation. Hypothesizing an effect of a religious education is more challenging. Childhood Jewish religious education, ideally, may create a worldview that encourages reliance on God and integration into a synagogue community, both of which may promote psychosocial benefits, such as enhanced well-being, hope, or optimism. Whether such idealized benefits translate into physical or functional ones decades later is uncertain.

A critical issue that emerges in studies of religion and physical health is the potential confounding of measures of public religious behavior, such as synagogue participation, with health itself, particularly functional health. Higher scores on such religious measures may reflect better health – after all, people need to be ambulatory in order to attend synagogue – so subsequent statistical associations with health may be partly artifactual: a correlation of health (as assessed by health measures) with health (as assessed by public religious behavior measures). This methodological problem may be exacerbated in studies of older adults and in studies using prevalence survey (i.e., cross-sectional) designs, although there is longitudinal evidence that this issue is overstated: religious participation has been shown to persist and to be beneficial despite age-related functional declines [17,18]. In the present study, the wording and time-referents of these measures, as noted above, may partly mitigate this issue, enabling an inference of temporality (i.e., cause and effect), but still it remains, as in all cross-sectional studies. Since age adjustment is one way to address this issue, the effects of age are controlled for in this study. This may enable more secure conclusions regarding the effects of religiousness controlling for a potentially confounding impact of age-related declines in physical function.

## SUBJECTS AND METHODS

### SHARE – SURVEY OF HEALTH, AGEING AND RETIREMENT IN EUROPE

SHARE is a cross-national survey program containing data on health, socioeconomic status, and social and family networks among adults aged 50 or over, based on the Health and Retirement Study and the English Longitudinal Study of Ageing. The first wave of data was collected in 2004 in 11 European nations, and totaled over 27,000 respondents [19]. Subsequently, two more waves were added, with additional national samples, for a total of over 45,000 respondents.

From October 2005 to July 2006, data were collected for an Israeli sample [20]. Sampling of households was conducted (using a multi-stage stratified area probability procedure), with a nationwide telephone directory database (95% population coverage) and a sample of 150 of Israel's official 2300 statistical areas. The sample of eligible households numbered 2586 and the total sample of household interviews 1771, yielding a response rate of 68.5%. The final sample comprised 2586 interviewed respondents, of whom 2498 were aged 50 years or older. Data were collected by a computer-assisted personal interview (CAPI) system, with interviews lasting about 90 minutes. Detailed information can be found elsewhere [21]. The present analyses are limited to the survey's 1287 Jewish respondents (identified through a single-item measure of religious affiliation included in a subsample of 1704 respondents, representing 75.5% of the total sample). The average age was 64.4 years.

### MEASUREMENTS

These analyses use single-item variables and scales assessing physical health, religiousness, and potential mediators and covariates. Many were reverse-coded or contain other recodes to facilitate analyses.

**Physical health indicators include:**

- *Self-rated health* ("Would you say your health is: ___?"; two questions combined and recoded as: 1 = poor or very bad, 2 = bad, 3 = fair, 4 = good, 5 = very good, 6 = excellent)
- *Long-term health problems* ("Do you have any long-term health problems, illness, disability or infirmity?" Coded: 0 = no, 1 = yes)
- *Activity limitation* ("For the past six months at least, to what extent have you been limited because of a health problem in activities people usually do?" Coded: 1 = not limited, 2 = limited, but not severely, 3 = severely limited)
- *Diagnosed chronic diseases* ("Has a doctor ever told you that you had any of the conditions on this card?"; a total score [coded: 0 = not selected, 1 = selected] summarizing 14 diagnoses: heart attack or other heart problems, high blood pressure, high blood cholesterol, stroke or cerebrovascular disease, diabetes, chronic lung disease, asthma, arthritis or rheumatism, osteoporosis, cancer or malignant tumor, stomach or duodenal or peptic ulcer, Parkinson disease, cataracts, hip or femoral fracture [$\alpha = 0.51$])
- *Physical symptoms* ("For the past six months at least, have you been bothered by any of the health conditions on this card?"; a total score [coded: 0 = not selected, 1 = selected] summarizing 11 symptoms: pain in back or knees or hips or other joint, heart trouble, breathlessness, persistent cough, swollen legs, sleeping problem, falling down, fear of falling down, dizziness or faints or blackouts, stomach or intestinal problems, incontinence [$\alpha = 0.74$])
- *ADL* (Activities of Daily Living Scale; a total score [coded: 0 = not selected, 1 = selected] of current physical limitations of over three months duration, summarized over 10 items [$\alpha = 0.85$])
- *IADL* (Instrumental Activities of Daily Living Scale; a total score [coded: 0 = not selected, 1 = selected] of current functional limitations of over three months duration, summarized over 13 items [$\alpha = 0.90$]).

**Religious measures include:**

- *Synagogue activities* ("Have you done any of these activities in the last month?: Taken part in a religious organization (church, synagogue, mosque, etc.)" Coded: 0 = no, 1 = yes)
- *Prayer* ("Thinking about the present, how often do you pray?" Coded: 1 = never, 2 = less than once a week, 3 = once a week, 4 = a couple of times a week, 5 = once daily or almost daily, 6 = more than once a day)
- *Religious education* ("Have you been educated religiously by your parents?" Coded: 0 = no, 1 = yes).

**Mediators include:**

- *Health behavior* (an index combining questions on smoking and drinking and coded 0 to 4, with higher scores designating more unhealthy behavior)
- *Social support* (an index combining questions on receiving help from outside the household in the past year and coded 0 to 4, with higher scores designating more frequent help).

**Covariates include:**

- *Age* (in years)
- *Gender* (0 = male, 1 = female)
- *Education* (0 = none, 1 = elementary school, 2 = non-academic secondary school – did not graduate, 3 = non-academic secondary school – graduated, 4 = academic secondary school – did not graduate, 5 = academic secondary school – graduated)
- *Marital status* (0 = not currently married and living together, 1 = currently married and living together)
- *Birth place* (0 = born outside Israel, 1 = born in Israel).

### STATISTICAL ANALYSIS

Analyses were conducted using SAS 9.2 Descriptive statistics (means and standard deviations), and bivariate Pearson ($r$) correlations for all study variables were obtained using the UNIVARIATE and CORR procedures, respectively. Hierarchical OLS regression was used to analyze effects of study variables on seven physical health indicators, separately, using the REG procedure. In Model I, each health indicator was regressed onto (i.e., determined by) the three religious measures; in Model II, the two mediating variables were added; in Model III, the five covariates were added, ensuring adjustment for age. Standardized ($\beta$) and unstandardized ($b$) regression coefficients are given, enabling comparisons both within and among respective outcome measures and associated models. This enables a look at the impact on health of each religious measure in multiple situations: bivariately (via correlations) and multivariably, both in the presence of other religious measures (Model I) and after controlling for effects of all other predictors (Models II and III).

## RESULTS

Table 1 shows that the three religious measures are significantly intercorrelated, as are all seven health indicators. As anticipated, synagogue attendance is associated with better health

**Table 1.** Descriptive statistics and Pearson correlations* for study variables

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Mean | SD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Synagogue activities | | | | | | | | | | | | | | | | | .11 | .31 |
| 2. Prayer | .51[c] | | | | | | | | | | | | | | | | 2.4 | 1.8 |
| 3. Religious education | .27[c] | .40[c] | | | | | | | | | | | | | | | .53 | .50 |
| 4. Self-rated health | -.01 | -.11[c] | -.08[b] | | | | | | | | | | | | | | 3.6 | 1.3 |
| 5. Long-term problems | -.01 | .02 | -.01 | -.50[c] | | | | | | | | | | | | | .56 | .50 |
| 6. Activity limitation | -.02 | .12[c] | .07[a] | -.61[c] | .49[c] | | | | | | | | | | | | 1.5 | .71 |
| 7. Chronic diseases | -.06[a] | .01 | .04 | -.49[c] | .45[c] | .44[c] | | | | | | | | | | | 1.6 | 1.6 |
| 8. Physical symptoms | .01 | .16[c] | .13[c] | -.56[c] | .34[c] | .53[c] | .54[c] | | | | | | | | | | 1.7 | 1.9 |
| 9. ADL | -.02 | .12[c] | .13[c] | -.57[c] | .37[c] | .62[c] | .46[c] | .65[c] | | | | | | | | | 1.6 | 2.3 |
| 10. IADL | -.06[a] | .07[b] | .10[c] | -.43[c] | .23[c] | .50[c] | .36[c] | .50[c] | .71[c] | | | | | | | | .69 | 1.9 |
| 11. Poor health behavior | -.08[b] | -.08[b] | .01 | .03 | .00 | -.07[b] | .02 | -.01 | -.01 | .01 | | | | | | | 1.1 | 1.1 |
| 12. Social support | .01 | .10[c] | .11[c] | -.27[c] | .16[c] | .32[c] | .24[c] | .33[c] | .37[c] | .43[c] | .03 | | | | | | .39 | 1.0 |
| 13. Age | .01 | .01 | .10[c] | -.29[c] | .21[c] | .24[c] | .36[c] | .29[c] | .35[c] | .33[c] | -.02 | .29[c] | | | | | 64.4 | 10.3 |
| 14. Female | -.19[c] | -.08[b] | -.02 | .03 | -.08[b] | -.04 | .03 | .10[c] | .09[b] | .05 | .08[b] | .05 | -.13[c] | | | | .57 | .50 |
| 15. Education | -.13[c] | -.18[c] | -.27[c] | .21[c] | -.07[a] | -.16[c] | -.10[c] | -.22[c] | -.24[c] | -.16[c] | -.04 | -.15[c] | -.13[c] | .07[b] | | | 3.5 | 1.6 |
| 16. Married | .07[b] | .02 | .00 | .15[c] | -.11[c] | -.17[c] | -.16[c] | -.21[c] | -.25[c] | -.24[c] | .00 | -.30[c] | -.26[c] | -.17[c] | .06[a] | | .76 | .43 |
| 17. Israeli born | -.09[c] | -.11[c] | -.18[c] | .25[c] | -.13[c] | -.16[c] | -.22[c] | -.21[c] | -.21[c] | -.17[c] | -.02 | -.15[c] | -.33[c] | .04 | .13[c] | .10[c] | .37 | .48 |

[a]$P < 0.05$, [b]$P < 0.01$, [c]$P < 0.001$

according to two indicators, and prayer is associated with worse health according to five measures, as is religious education. Religiousness is mostly associated with healthy behavior and social support, and the latter is associated inversely with health: those in worse health are more likely to have received outside help. Finally, age is inversely associated with health; furthermore, compared to immigrants, native-born Israelis are healthier and less religious.

Table 2 demonstrates that synagogue attendance is significantly associated with better health for six of the seven health indicators (Model I); for five of these, the effect remains significant after all adjustments (Model III). As expected, greater attendance is associated with less morbidity, even after adjusting for age. Still, notwithstanding age adjustment, one cannot be certain that this indicates a protective effect as opposed to an artifact of better ambulatory status.

Prayer is significantly associated with poor health according to five health indicators (Model I); all of these remain significant after all adjustments (Model III). The directionality is as expected, perhaps indicating that prayer is used as a coping mechanism. Religious education is associated with three health measures (Model I), but no effects remain after adjustment. Finally, the bivariate effects of age and being born in Israel persist as net effects for every health measure, underscoring the importance of having adjusted for them in these analyses.

## DISCUSSION

The findings for synagogue involvement and prayer are robust: they are observed across various health measures. Moreover, they withstand adjusting for health behavior, social support, and several sociodemographic correlates, most importantly age. This suggests (but cannot prove with certainty) a beneficial health effect of religious participation, as found by studies in other populations. Without multiple waves of data or a longitudinal design, one cannot rule out that this finding at least partly reflects an artifact in assessment of synagogue participation among these older respondents [22] related to its possible confounding with functional health, as described earlier.

Combined with the findings for prayer, these analyses do not prove that religion does not serve a protective or primary preventive function in this population (although it may), but that certain expressions of religiousness may decline with poor health (e.g., synagogue attendance) and others may increase as a coping response (e.g., prayer). The main finding here may be of less relevance epidemiologically but of greater relevance for caregivers focused on providing social and health services in partnership with religious organizations and resources.

One finding involving a covariate [Table 2] may appear unusual, but really is not. Social support is significantly and strongly associated with poorer health for every health mea-

**Table 2.** Regressions of physical health indicators on religious measures

| | Self-rated health | | | Long-term health problems | | | Activity limitation | | |
|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | I | II | III | I | II | III |
| | β (b) SE | β (b) SE | β (b) SE | β (b) SE | β (b) SE | β (b) SE | β (b) SE | B (b) SE | β (b) SE |
| Synagogue activities | .06 (.27)[a] .14 | .04 (.18) .13 | .05 (.22) .13 | -.03 (-.04) .05 | -.01 (-.02) .05 | -.03 (-.04) .05 | -.12 (-.27)[c] .07 | -.09 (-.22)[b] .07 | -.10 (-.23)[b] .07 |
| Prayer | -.13 (-.09)[c] .03 | -.10 (-.07)[b] .02 | -.10 (-.07)[b] .02 | .04 (.01) .01 | .03 (.01) .01 | .04 (.01) .01 | .17 (.07)[c] .01 | .13 (.05)[c] .01 | .13 (.05)[c] .01 |
| Religious education | -.05 (-.13) .08 | -.03 (-.07) .08 | .04 (.11) .08 | -.02 (-.02) .03 | -.03 (-.03) .03 | -.07 (-.07)[a] .03 | .03 (.05) .04 | .01 (.01) .04 | -.03 (-.04) .04 |
| Poor health behavior | | .02 (.02) .03 | .03 (.03) .03 | | .00 (.00) .01 | .00 (.00) .01 | | -.08 (-.05)[b] .02 | -.09 (-.05)[b] .02 |
| Social support | | -.26 (-.33)[c] .04 | -.17 (-.22)[c] .04 | | .16 (.08)[c] .01 | .10 (.05)[b] .01 | | .31 (.22)[c] .02 | .24 (.17)[c] .02 |
| Age | | | -.16 (-.02)[c] .00 | | | .15 (.01)[c] .00 | | | .11 (.01)[c] .00 |
| Female | | | .01 (.04) .07 | | | -.07 (-.07)[a] .03 | | | -.04 (-.06) .04 |
| Education | | | .14 (.12)[c] .02 | | | -.03 (-.01) .01 | | | -.10 (-.05)[c] .01 |
| Married | | | .03 (.10) .09 | | | -.04 (-.04) .03 | | | -.06 (-.11)[a] .05 |
| Israeli born | | | .15 (.39)[c] .08 | | | -.07 (-.07)[a] .03 | | | -.06 (-.10)[a] .04 |
| *F* | 7.56 | 22.63 | 25.39 | .49 | 6.75 | 9.27 | 10.71 | 34.76 | 24.36 |
| *p* | ‹.0001 | ‹.0001 | ‹.0001 | .69 | ‹.0001 | ‹.0001 | ‹.0001 | ‹.0001 | ‹.0001 |
| $R^2$ | .02 | .08 | .17 | .00 | .03 | .07 | .02 | .12 | .17 |

[a]$P < 0.05$, [b]$P < 0.01$, [c]$P < 0.001$

**Table 2** continued

| | Diagnosed chronic diseases | | | Physical symptoms | | | ADL scale | | |
|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | I | II | III | I | II | III |
| | β (b) SE | β (b) SE | β (b) SE | β (b) SE | β (b) SE | β (b) SE | β (b) SE | B (b) SE | β (b) SE |
| Synagogue activities | -.09 (-.47)[b] .16 | -.07 (-.36)[a] .16 | -.06 (-.31)[a] .16 | -.11 (-.69)[c] .20 | -.08 (-.52)[b] .19 | -.07 (-.41)[a] .19 | -.13 (-.98)[c] .24 | -.10 (-.77)[c] .23 | -.09 (-.70)[b] .22 |
| Prayer | .04 (.04) .03 | .02 (.01) .03 | .03 (.03) .03 | .18 (.19)[c] .04 | .14 (.16)[c] .04 | .15 (.16)[c] .04 | .14 (.19)[c] .04 | .11 (.14)[c] .04 | .12 (.16)c .04 |
| Religious education | .05 (.16) .10 | .02 (.08) .09 | -.03 (-.09) .09 | .10 (.37)[b] .12 | .06 (.25)[a] .11 | .01 (.02) .11 | .11 (.53)[c] .14 | .08 (.39)[b] .13 | .02 (.08) .13 |
| Poor health behavior | | .01 (.02) .04 | .01 (.02) .04 | | -.01 (-.01) .04 | -.02 (-.04) .04 | | -.02 (-.04) .05 | -.04 (-.07) .05 |
| Social support | | .24 (.37)[c] .04 | .13 (.20)[c] .04 | | .31 (.59)[c] .05 | .21 (.40)[c] .05 | | .35 (.82)[c] .06 | .23 (.54)[c] .06 |
| Age | | | .28 (.04)[c] .00 | | | .18 (.03)[c] .01 | | | .23 (.05)[c] .01 |
| Female | | | .04 (.13) .09 | | | .12 (.44)[c] .10 | | | .10 (.49)[c] .12 |
| Education | | | -.04 (-.04) .03 | | | -.14 (-.16)[c] .03 | | | -.16 (-.24)[c] .04 |
| Married | | | -.04 (-.13) .10 | | | -.07 (-.31)[a] .12 | | | -.09 (-.48)[b] .15 |
| Israeli born | | | -.10 (-.32)[c] .09 | | | -.08 (-.33)[b] .11 | | | -.06 (-.29)[a] .13 |
| *F* | 3.40 | 17.66 | 24.37 | 17.69 | 39.06 | 33.51 | 15.77 | 47.55 | 45.67 |
| *p* | .0173 | ‹.0001 | ‹.0001 | ‹.0001 | ‹.0001 | ‹.0001 | ‹.0001 | ‹.0001 | ‹.0001 |
| $R^2$ | .01 | .07 | .17 | .04 | .13 | .21 | .04 | .16 | .27 |

[a]$P < 0.05$, [b]$P < 0.01$, [c]$P < 0.001$

sure (Models II and III), which would seem to contradict the longstanding literature on social support and health [23]. In the present study, however, this measure was constructed to assess help from outside the household, and such help is, on average, utilized more among those with health problems, especially in a society like Israel which provides for people with such needs. This also serves, incidentally, as another possible proxy, alongside age, for the kind of physical declines that might increase the likelihood of being confined to one's home. That this measure, too, was adjusted for in multivariable analyses may provide additional support for the synagogue attendance findings being substantive and not artifactual.

**Table 2** continued

| | IADL scale | | |
|---|---|---|---|
| | I | II | III |
| | β (b) SE | β (b) SE | β (b) SE |
| Synagogue activities | -.14 (-.88)[c] .19 | -.11 (-.67)[c] .18 | -.10 (-.59)[c] .18 |
| Prayer | .11 (.12)[b] .04 | .06 (.07)[a] .03 | .07 (.08)[a] .03 |
| Religious education | .10 (.38)[c] .12 | .06 (.23)[a] .11 | .02 (.10) .10 |
| Poor health behavior | | -.01 (.01) .04 | -.01 (-.02) .04 |
| Social support | | .42 (.79)[c] .04 | .32 (.60)[c] .05 |
| Age | | | .21 (.04)[c] .01 |
| Female | | | .04 (.14) .10 |
| Education | | | -.07 (-.09)[b] .03 |
| Married | | | -.08 (-.34)[b] .12 |
| Israeli born | | | -.03 (-.10) .10 |
| *F* | 11.67 | 62.18 | 43.12 |
| *p* | <.0001 | <.0001 | <.0001 |
| $R^2$ | .03 | .20 | .26 |

[a]$P < 0.05$, [b]$P < 0.01$, [c]$P < 0.001$

Another minor point: regarding the internal-consistency reliability of health outcome measures, these are mostly simple counts that summarize the presence of health conditions or challenges – not quite the same as psychological scales which jointly assess a common underlying concept. The relatively low reliability score for diagnosed chronic diseases (α = 0.51) is therefore not a problem in this study; the index still provides an accurate count of diagnosed diseases. The other three scales exhibit high reliability.

In summary, the present study offers modest evidence of a health benefit from Jewish religiousness – whether as a protective factor or a coping response – that is consistent with results from previous studies in other religious groups and in other countries. Similar to studies of non-Jews and studies outside of Israel, particular religious indicators are significantly associated with health-related outcome measures even after controlling for effects of potential mediators and sociodemographic correlates. It is noteworthy that the present findings relate to physical or functional health, not to mental health or psychological well-being for which a measured religious impact, for good or bad, may be more anticipated in light of psychological theory and clinical observation [24].

Without detailed information on religious identity and observance – according to the familiar Israeli categories of ultra-Orthodox (*haredim*), orthodox/observant (*dati'im*), traditional (*masortim*), and secular (*hilonim*) – it is not known whether these findings differ among these different religious groups of Jewish Israelis. Recent analyses of Israeli data on mental health suggest such a gradient in both religiousness and well-being, although not in their interrelation [14]. It would be valuable to explore whether such differences exist for physical health as well, especially since these religious categories serve to identify distinctive sociocultural and socioeconomically defined groups within Israeli society [25]. The challenge, as always, for research on this subject is for access to data sources that contain both validated indicators of health or disease status and religious measures that make sense within a respective population and culture, such as among Israeli Jews.

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## Capsule

### Passenger deletions generate therapeutic vulnerabilities in cancer

Inactivation of tumor-suppressor genes by homozygous deletion is a prototypic event in the cancer genome, yet such deletions often encompass neighboring genes. The authors propose that homozygous deletions in such passenger genes can expose cancer-specific therapeutic vulnerabilities when the collaterally deleted gene is a member of a functionally redundant family of genes carrying out an essential function. The glycolytic gene enolase 1 (ENO1) in the 1p36 locus is deleted in glioblastoma (GBM), which is tolerated by the expression of ENO2. Muller and co-scientists show that short-hairpin-RNA-mediated silencing of ENO2 selectively inhibits growth, survival and the tumorigenic potential of ENO1-deleted GBM cells, and that the enolase inhibitor phosphonoacetohydroxamate is selectively toxic to ENO1-deleted GBM cells relative to ENO1-intact GBM cells or normal astrocytes. The principle of collateral vulnerability should be applicable to other passenger-deleted genes encoding functionally redundant essential activities and provide an effective treatment strategy for cancers containing such genomic events.

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## Capsule

### Antibodies to fight Influenza

With its ability to reassort in animal hosts like pigs and birds, and to cause pandemics, influenza A viruses are often in the spotlight. However, a substantial portion of the annual flu burden is also the result of influenza B virus, which is a single influenza type that is characterized by two antigenically and genetically distinct lineages. Dreyfus and colleagues identified three monoclonal human antibodies that are able to protect against lethal infection with both lineages of influenza B virus in mice. Two antibodies, which bind to distinct regions of the viral hemagluttinin (HA) molecule, neutralize multiple strains from both lineages of influenza B virus, whereas the third antibody binds to the stem region of HA and is able to neutralize both influenza A and B strains. The structural data from these antibodies bound to HA, together with already known antibodies targeting influenza A, may provide clues for designing a universal vaccine to protect against both influenza virus types.

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