

# Religiosity as a moderator of ADHD-related antisocial behaviour and emotional distress among secular, religious and Ultra-Orthodox Jews in Israel

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## Abstract

**Background:** ADHD predicts higher levels of antisocial behaviour and distress while religiosity is related to lower levels of both. This raises the hitherto unexplored question of how these variables interact.

**Aims:** The objective of this study was to explore how religious individuals with ADHD fare in terms of these psychosocial outcomes.

**Method:** 806 secular, religious and Ultra-Orthodox Jewish adults in Israel completed measures of ADHD symptoms and treatment, emotional strengths and difficulties, religious belonging, religious behaviour and antisocial behaviour.

**Results:** Findings supported an additive-interactive model in which religiosity (a) correlates with lower levels of ADHD symptoms and diagnosis, (b) directly relates to less antisocial behaviour and less distress and (c) moderates the negative effects of ADHD on antisocial behaviour and distress. Findings further suggest that religious observance rather than religious belonging drives most of the moderating effect of religiosity, while religious belonging rather than religious observance drives negative attitudes towards ADHD.

**Conclusions:** Implications include the importance of treating religious individuals with ADHD in a more nuanced manner and of providing more information on ADHD to religious communities.

## Keywords

Attention Deficit Hyperactivity Disorder, antisocial behaviour, emotional distress, religious observance, religious belonging, social psychiatry

## Introduction

Two recurring findings in the study of mental health and religion are that ADHD predicts higher levels of antisocial behaviour and distress (Ryan et al., 2016; Young et al., 2015) and that religiosity is related to lower levels of both (Kelly et al., 2015; Park, 2017). This raises a conundrum not previously addressed in the research literature: How do religious individuals with ADHD fare in terms of these psychosocial outcomes? The following study explores the relationships between religiosity, ADHD, antisocial behaviour and emotional distress in a sample of 806 Jewish Israeli individuals ranging from secular to Ultra-Orthodox (a conservative and highly religious group).

This topic is of importance to religious populations since lack of information about the relation between ADHD and religiosity may fuel the difficulties experienced by religious individuals with ADHD and the concerns of their

parents, educators and religious leaders. Understanding the link between ADHD and religious functioning can alleviate these concerns and allow such individuals to integrate more successfully into their religious community.

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## The effects of ADHD and of religiosity on psychosocial outcomes

ADHD has been repeatedly associated with emotional distress (Kessler et al. 2006; Ryan et al., 2016, Sobanski, 2006), difficulties with social adjustment (Hoza, 2007; Kok et al., 2016), antisocial behaviour, delinquency, crime and incarceration (Fazel et al., 2008; Mohr-Jensen & Steinhausen, 2016; Pratt et al., 2002; Young et al., 2015). In contradistinction, being religious has been associated with less antisocial behaviour, lower delinquent behaviour, higher prosocial activity and higher well-being in both Western and non-Western cultural contexts (Abdel-Khalek, 2014; Ellison & Fan, 2008; Hood et al., 2018; Kelly et al., 2015; Laird et al., 2011). Meta-analyses and reviews have established a significant moderately negative correlation between religiosity and anti-sociality (Cheung & Yeung, 2011), while one longitudinal study indicated that religiosity may be causally related to lower levels of criminal behaviours among adolescents (Pirutinsky, 2014). In a recent review, Purwono et al. (2019) found that adolescent religiosity has been negatively associated with antisocial behaviour, including risky sexual practices, delinquency and substance use. Religiosity has also been associated with higher levels of self-control (ibid), effortful control (EC – the ability to control impulses to attain long-term goals), patience and obedience (McCullough & Willoughby, 2009; Reisig et al., 2012; Schnitker & Emmons, 2007). Finally, both religiosity and effortful control (EC) were negatively associated with aggression and problem behaviours such as stealing, lying to parents, fighting and skipping school (Aguilar-Cárceles et al., 2017; Schoepfer et al., 2019). These findings support the hypothesis that religiosity moderates the relation between EC and antisocial behaviours.

Although the combined effect of being religious and having ADHD on antisocial behaviour and emotional distress has previously not been explored, there are reasons to believe that religion might moderate the negative effect of ADHD on well-being and social behaviours:

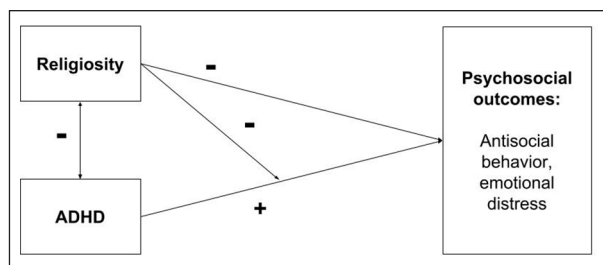
First, salutogenic theories of religiosity and spirituality (Aldwin et al., 2014; Antonovsky, 1996) suggest that religion might relieve some of the effects of ADHD and turn its challenges into a force for spiritual growth. Second, the buffering effect of a close-knit community (Hood et al., 2018) could decrease the loneliness associated with ADHD. Third, religious coping strategies such as prayer can help manage challenges associated with ADHD by imparting meaning on one's difficulties (Park et al., 2013) and fourth, powerful social-religious prohibitions on antisocial behaviours in religious groups may minimize options and motivation for engaging in such behaviours (Reisig et al., 2012). If EC is a 'mental muscle' which improves upon use (Baumeister & Exline, 1999), then religious individuals with ADHD may end up improving their EC (Hathaway & Barkley, 2003) thereby increasing their sense of well-being (McCullough & Willoughby, 2009).

## ADHD in religious communities – prevalence and psychosocial outcomes

ADHD is considered a neurodevelopmental disorder, whose aetiology is mainly genetic (Faraone et al., 2015). Therefore, the possibility that early religious belonging and observance play an etiological role in the development of ADHD symptoms is unlikely. Large epidemiological studies of the prevalence of ADHD in various populations have not typically included religiosity level as a variable (Polanczyk et al., 2014). However, there are two reasons to believe that the prevalence and reported prevalence of ADHD in adult religious communities is lower than among the general population, each supported by studies:

- (a) A higher religious attrition rate of individuals with ADHD is likely, since religiosity involves upholding rules and preserving boundaries, a particular challenge for this group. Religious behaviour also often requires EC (e.g. sitting still in services; observing dietary laws), and being part of a religious group involves adhering to group norms, another challenge for individuals with ADHD. Indeed, studies have found that fewer children and adolescents with ADHD attend religious services on a regular basis compared to those without ADHD (Lee et al., 2008; Mercer, 2011; Whitehead, 2018; c.f. Dew et al., 2007), and ADHD in childhood has been found to negatively correlate with the importance of organized religion in adult life (Mason, 2012).
- (b) While ADHD is stigmatized in the general population (Lebowitz, 2016), religious communities tend to have especially widespread mental health stigmas and ADHD may be especially stigmatized in religious groups, due to its expression in behavioural deviance (Peteet, 2019). Indeed, Li (2013) found that compared to the rest of the population, evangelical Christians were less likely to view ADHD as a real disease and more likely to reject treatment with medication. ADHD is under-reported, under-diagnosed and under-treated among minorities, including religious minorities (Slobodin & Masalha, 2020). Specifically, there are preliminary indications of a lower reported prevalence of the condition among Orthodox Jews (Armon, 2015).

Among the Ultra-Orthodox, ADHD has been found to relate to concealment of the condition, fear of condemnation, shame, weakened self-esteem and educational and occupational attrition (Armon, 2015; Ben Yair & Ronel, 2014; Goshen-Phillip, 2016). Impaired religious-spiritual functioning and stigmatization may explain the high level of distress among individuals with ADHD in religious communities (Ciftci et al., 2013; Dew et al., 2007; Hathaway et al., 2003; Filip, 2005; Mercer, 2011; Wesselmann & Graziano, 2010). Despite these challenges,



**Figure 1.** A model of the effects of religion and ADHD on psychosocial outcomes.

some inclusive religious communities, which focus on welcoming all worshippers, may become a haven for marginalized people with ADHD (Barkley, 2014; Mercer, 2011).

Based on these findings, the hypothetical model tested in this study is additive and interactive (Figure 1) and is expected to be most predictive for practice-based highly religious groups.

In this model, the more religious a group, the lower the reported prevalence of ADHD in it. Tested separately, religiosity will positively affect psychosocial outcomes, while ADHD will negatively affect those same psychosocial outcomes. Tested conjointly, religiosity will moderate the negative effect of ADHD on psychosocial outcomes, reducing its detrimental effects.

### Research hypotheses

This study was conducted in a Jewish Israeli context to provide information on ADHD in highly religious communities. Israelis tend to dichotomise Jewish society as ‘religious’ or ‘non-religious.’ Most Israeli Jews also identify themselves as belonging to one of five subgroups: secular (44%–51% of the population) and traditional (30%–39%) make up the ‘non-religious’ category; Religious Zionists (10%–15% of the population in Israel), Modern Ultra-Orthodox (a hybrid category, see Cahaner & Malach, 2019) and Ultra-Orthodox (9%–12.5% of the population), make up the ‘religious’ category (Central Bureau of Statistics, 2016; Guttman Center for Surveys, 2012)

We hypothesized the following:

1. Religious Jews (Ultra-Orthodox, Modern Ultra-Orthodox and Religious Zionist) will report lower levels of ADHD symptoms than will non-religious ones (traditional and secular).
2. Higher religiosity (in terms of belonging and of observance) will predict less antisocial behaviour and less emotional distress.
3. More ADHD symptoms will predict more antisocial behaviour and more emotional distress.
4. Religiosity will moderate the negative consequences of ADHD on antisocial behaviour and emotional distress.

5. Negative cultural attitudes towards ADHD will relate to higher levels of religiosity and more emotional distress among individuals with ADHD.

## Method

### Recruitment

Participants were recruited using convenience and snowball sampling with multiple points of onset via social networks that are commonly used in Israeli religious communities (Facebook and WhatsApp). Participants were told that the purpose of the study was to explore difficulties in keeping boundaries. ADHD was not mentioned while recruiting and there were no a-priori inclusion/exclusion criteria, in order to enlist participants with and without ADHD.

### Sample

The questionnaire was administered to 1,200 respondents. Of these, only those who reported their religious affiliation, gender and ADHD status and who were over 16 years of age ( $n=806$ ) were selected. 213 participants were excluded due to age considerations (210 participants under 16, and 3 outliers over 80). 18 participants were excluded because they did not report their gender; 81 – because of non-specific or missing religious affiliation; 64 – due to a lack of reported ADHD status and 38 – due to unreliable answering patterns (no variance in answers).

Of the 806 participants who made up the final sample, 51.6% were males and 48.4% were females. Their average age was 26.54 ( $SD=10.2$ ), with a range of 16 to 66. The average number of children in their family of origin was 5.95 ( $SD=3.09$ ). See full details in Table 1.

To allow for a higher-resolution analysis of religious subtypes, religious participants were over-sampled (79.1% of the sample versus 20% to 30% in the Israeli Jewish population; Central Bureau of Statistics, 2016) as were participants with ADHD (19.6% of the sample reported being diagnosed with ADHD versus an estimated 5% in the population; Willcutt, 2012).

### Measures

The ADHD categorical measure asked participants to note whether they had been diagnosed with ADHD, diagnosed as borderline-ADHD, not been diagnosed but suspect they have ADHD and do not have ADHD. The purpose of this was to bypass some of the stigma against mental disorders in religious communities, which may lead to under-testing and under-reporting of full-fledged ADHD through medical channels, as noted in the introduction.

Adult ADHD Self-Report Scale (ASRS-v1.1) is an 18-item scale measuring symptoms of ADHD based on DSM-IV criteria (Kessler et al., 2005). Participants are

**Table 1.** Demographics of sample: religious belonging, gender and age by ADHD status.

		None	Diagnosed	Undiagnosed	Total
Religious belonging	Secular	75 (42%)	52 (29%)	53 (29%)	180
	Traditional	30 (43%)	16 (23%)	24 (34%)	70
	RZ	100 (52%)	32 (17%)	60 (31%)	192
	MUO	97 (51%)	28 (16%)	48 (28%)	173
	UO	102 (53%)	30 (16%)	59 (31%)	191
Total		404	158	244	806
Gender	Male	187	101	131	419
	Female	217	57	113	387
Age	(Mean, sd)	27.53 (10.5)	23.66 (9.27)	26.75 (10.22)	26.54 (10.2)

UO: Ultra-Orthodox; MUO: Modern Ultra-Orthodox; RZ: Religious Zionist.

asked about the occurrence of ADHD symptoms, using 1-5 scale where 1 is 'never' and 5 is 'very often.' This scale has been professionally translated to Hebrew and found valid and reliable for the Israeli population (Cronbach's  $\alpha = .85$ ; Zohar & Konfortes, 2010). In this study, the Cronbach's  $\alpha$  for the ASRS was .89. In Israel, the clinical cut-off point for diagnosing ADHD using the ASRS requires scoring over 50 of a possible score of 90 on the entire scale (ibid).

Attitudes to ADHD scale, designed for this study, measures the attitudes of respondents to ADHD on a 1-5 scale, where 1 reflects a very positive and 5 reflects a very negative attitude to ADHD. The scale includes 11 items, and following reliability testing, 8 items were retained in this study. Examples of items are 'People with ADHD are lazy' and 'People don't want to marry people with ADHD'. The Cronbach's  $\alpha$  for the ADHD attitude scale was .72. Our assumption was that when analysed on a group-level, this measure indicates group attitudes to ADHD.

The Antisocial Behaviour Scale (ABS) is a 23-item scale based on Elliott and Ageton's (1980) Self-Report Delinquency scale (SRD) and on its Hebrew version by Yaakovson (2008) which was adapted for adults. Participants rated their answers on 1-5 scale, where 1 reflects no acts of delinquency and antisocial behaviour and 5 reflects frequent acts delinquency and antisocial behaviour. The measure includes six subscales: property, drugs, violence, internet, traffic and asocial activities. Cronbach's  $\alpha$  for the ABS scale was .89.

The Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997) was administered in a self-report version, professionally translated into Hebrew (sdqinfo.org). The SDQ is a 25-item 3-point Likert-type scale (0 = not true, 1 = somewhat true, 2 = certainly true) measuring four types of difficulty (hyperactivity, emotional symptoms, conduct problems and peer problems;  $\alpha = .62$  in adult version of scale, Brann et al., 2018), as well as prosocial behaviour (Goodman, 1997, 2001). Participants completed the entire SDQ in this study ( $\alpha = .79$ ), but for the main analyses, the emotional subscale ( $\alpha = .70$ ) was used as a measure of emotional distress.

**Religiosity measures.** We elicited two aspects of religiosity: Belonging and Behaving. All participants were asked to note their religious affiliation. Respondents who identified as religious or traditional were also asked to complete two specially developed religiosity scales:

The Religious observance scale (RO) measures behaviours related to the practical aspects of Judaism; examples of items include 'Observes the laws of the Sabbath and avoids desecrating it' and 'Recites the blessings before and after eating.'

The Ultra-Orthodox Identity scale measures the sense of commitment to an Ultra-Orthodox identity. Examples of items include 'avoids secular entertainment places such as clubs' and 'Would meet and marry spouse only through a traditional matchmaker.' Both scales were measured using a 1-5 Likert scale, where 1 is 'not at all' and 5 is 'to a very great extent'. Cronbach's  $\alpha$  was .93 for the Religious Observance scale and .94 for the Ultra-Orthodox Identity scale. Religious observance and Ultra-Orthodox Identity were highly intercorrelated in this sample ( $r = .64, p < .001, n = 625$ ). Secular participants were not asked to complete these two scales as they were considered irrelevant to them (resulting in  $n = 626$  for those models using Religious Observance and Ultra-Orthodox Identity).<sup>1</sup>

## Results

### Demographics

The first 2 ADHD groups (diagnosed and diagnosed as borderline ADHD) were combined to form a 'Diagnosed ADHD' group, the third – a 'Non-diagnosed ADHD' and the fourth – a 'No ADHD' group. Table 1 presents the distribution of the sample in terms of religiosity and ADHD.

There was no difference on the religious observance scale by gender, although the ratio of females to males differed across religious categories, with significantly more Ultra-Orthodox and Modern Ultra-Orthodox males and more Religious Zionist, traditional and secular females ( $p < .001$ ). ADHD levels did not differ significantly by gender in this sample, contrary to Israeli epidemiological data (Zohar & Konfortes, 2010). Being female was



significantly related to less antisocial behaviour symptoms on the SRD ( $F(1,804)=45.43, p < .001$ ), and higher distress on the SDQ emotional subscale ( $F(1,804)=23.18, p < .001$ ).

### Preliminary analyses

Among participants, 37.2% reported being recommended testing for ADHD. 28.8% of the sample reported being tested, and 19.6% were medically diagnosed with ADHD. Another 13.6% were told they have borderline ADHD and a further 19.6% were not tested but believe that they suffer from ADHD.

The relation between reported ADHD diagnosis (yes/no) and the ASRS symptom scale was tested using the cut-off criteria described above. The two diagnostic indicators matched each other to a large extent: Only 11.6% of those undiagnosed with ADHD met the symptom criteria for ADHD using our scale, whereas 49% of those diagnosed with ADHD met those same criteria ( $\chi^2=163.67, p < .001$ ). This can serve as a validity check for the ASRS and can alleviate the concern that individuals who are treated medically for ADHD might not have ranked highly on the ASRS.

### Hypothesis testing

For all hypotheses, statistical tests were conducted on both the continuous (ASRS) and dichotomous (ADHD yes/no) ways of measuring ADHD. Only results using the ASRS are reported for the sake of parsimony, but all tests were also highly significant in the same direction when using the dichotomous measure of ADHD in tests suitable for categorical variables.<sup>2</sup> Religious belonging and religious behaviour are reported separately, because one of the goals of this study was to assess the relative importance of each aspect of religiosity.

#### (i) Hypothesis 1: Religious individuals will report less ADHD

This hypothesis was supported by the findings. When ADHD was measured on a symptomatic scale, the difference between religious ( $M=2.48, SD=.73$ ) and non-religious participants ( $M=2.82, SD=.78$ ) was significant ( $F(1,804)=34.58, p < .001$ ). Likewise, when religiosity was measured as religious observance, more religious observance was related to lower levels of ADHD symptoms ( $r=-.28, n=626, p < .001$ ).

#### (ii) Hypotheses 2 and 3: Religiosity and ADHD in relation to antisocial behaviour and emotional distress

Both hypotheses were supported. Antisocial behaviour significantly differed by religious belonging ( $F(1,802)=20.73, p < .001$ , partial eta squared=.025). Participants

who identified as religious reported less antisocial behaviour ( $1.37, SD=.40$ ) than those who did not ( $1.57, SD=.56$ ). Antisocial behaviour was also negatively associated with higher levels of religious observance ( $r=-.382, p < .001, n=626$ ). Finally, antisocial behaviour was found to be associated with higher levels of ADHD symptoms ( $r=.423, p < .001, n=806$ ). Emotional distress, measured by the SDQ emotional subscale, significantly differed by religious belonging too ( $F(1,802)=8.07, p < .01$ , partial eta squared=.01). Participants who identified as religious reported less distress ( $1.70, SD=.48$ ) than non-religious ( $1.85, SD=.57$ ). Distress was also negatively associated with higher levels of religious observance ( $r=-.263, p < .001, n=626$ ). Finally, distress was positively associated with higher levels of ADHD symptoms ( $r=.491, p < .001, n=806$ ).

#### (iii) Hypothesis 4: Religiosity will moderate the negative consequences of ADHD

This hypothesis was partially supported by findings, depending on what aspect of religiosity was accounted for (group belonging or observance). A four-step regression model regressed antisocial behaviour onto gender, SES, religious belonging, religious observance and ADHD symptoms. All non-categorical variables were centred around the mean. First, gender and SES were controlled for. Second, antisocial behaviour was regressed onto a set of three contrast codes reflecting differences between types of religious belonging (traditional, Religious Zionist, Modern Ultra-Orthodox and Ultra-Orthodox). As noted above, participants self-identifying as secular were not asked about religious observance, so the following analyses exclude the secular group. Third, reported ADHD symptoms and reported religious observance were added to the model. In the fourth step interactions between each of the three contrast codes and ADHD symptoms and religious observance respectively, were examined as well. A model regressing emotional distress on the same variables was tested as well.

For antisocial behaviour the full model accounted for significant variance in antisocial behaviour and each step explained a significant part of the variance. Summary statistics for the first three steps are presented in Table 2. The  $R^2$  for the full model was .319; (adjusted  $R^2=.31; SE=.38; F(6,612)=22.08, p < .01$ ).

As can be seen in the table, in the full model, while controlling for gender and SES and adding religious observance and ADHD symptoms, ADHD symptoms were positively associated with more antisocial behaviour ( $B=.23, t(1)=9.69, p < .001$ ). Religious observance was associated with less antisocial behaviour ( $B=-.14, t(1)=-5.29, p < .001$ ). The effect of religious group disappeared when adding religious observance.

There was an interaction between religious observance and Ultra-Orthodoxy versus other (less religious) groups

**Table 2.** Hierarchical regression analyses for variables predicting antisocial behaviour ( $N=626$ ).

Variable	Unstandardized coefficients		Standardized coefficients	$t$	
	$B$	SEB	$B$		
Step 1 (controls)	Gender	-.20	.04	-.22	-5.68***
	SES	-.02	.02	-.03	-.72
Step 2	(Constant)	1.45	0.02		78.68***
	Traditional vs. others	-0.09	0.01	-0.25	-6.67***
	UO vs. MUO and RZ	-0.05	0.01	-0.14	-3.72**
Step 3	MUO vs. RZ	-0.01	0.02	-0.01	-0.32
	(Constant)	1.43	0.02		83.73***
	Traditional vs. others	-0.03	0.01	-0.08	-2.16*
	UO vs. MUO and RZ	-0.02	0.01	-0.06	-1.81
	MUO vs. RZ	0.01	0.02	0.02	0.61
	RO	-0.14	0.02	-0.23	-5.58***
Step 4	ASDS	0.20	0.02	0.32	9.08***
	(Constant)	1.46	0.02		60.33***
	Traditional vs. others	-0.04	0.02	-0.10	-1.73
	UO vs. MUO and RZ	0.00	0.01	-0.01	-0.33
	MUO vs. RZ	0.02	0.02	0.03	0.77
	RO	-0.14	0.03	-0.24	-5.29***
	ASRS	0.23	0.02	0.38	9.69***
	RO* (traditional vs. others)	-0.03	0.02	-0.09	-1.68
	RO* (UO vs. MUO and RZ)	-0.05	0.02	-0.10	-2.53*
	RO* (MUO vs. RZ)	0.01	0.03	0.02	0.50
	ASRS* (traditional vs. others)	-0.05	0.02	-0.11	-2.93**
ASRS* (UO vs. MUO and RZ)	-0.02	0.02	-0.05	-1.56	
ASRS* (MUO vs. RZ)	0.05	0.03	0.06	1.70	

Notes: (1) UO: Ultra-Orthodox; MUO: Modern Ultra-Orthodox; RZ: Religious Zionist; RO: religious observance; ASRS: ADHD self report scale.

(2) Control variables from step 1 included in steps 2, 3 and 4.

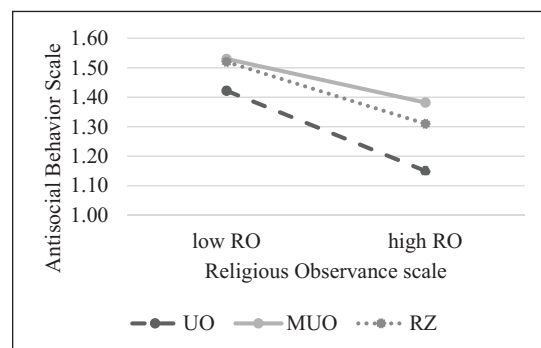
\* $p < 0.05$  \*\* $p < 0.01$  \*\*\* $p < 0.001$

( $B = -.054$ ,  $t(1) = -2.526$ ,  $p < .05$ ), and an interaction between ADHD symptoms and the traditional group versus all the other (more religious) groups ( $B = -.051$ ,  $t(1) = -2.927$ ,  $p < .01$ ).

When running the regression model separately for each religious group, the effect of ADHD on antisocial behaviour while controlling for religious observance was much stronger for the less religious groups, while the effect of religious observance on antisocial behaviour while controlling for ADHD was much stronger for the more religious groups. Figures 2 and 3 chart the slopes of each group (B).

For emotional distress, the full model accounted for significant variance in distress and each step explained a significant part of the variance. Summary statistics for the first three steps are presented in Table 3. The  $R^2$  for the full model was .29; (adjusted  $R^2 = .27$ ;  $SE = .42$ ;  $F(6,612) = 18.92$ ,  $p < 0.01$ ).

After controlling for gender, SES and religious groups, ADHD symptoms were positively associated with more distress ( $B = .303$ ,  $t(1) = 11.402$ ,  $p < .001$ ). Religious observance was associated with less distress ( $B = -.096$ ,  $t(1) = -3.27$ ,  $p < .01$ ). The question of whether these relationships changed based on religious belonging was also



**Figure 2.** Antisocial behaviour symptoms by religious observance for religious groups.

explored. None of the interactions were significant, so the sample was not split by religious group for further testing.

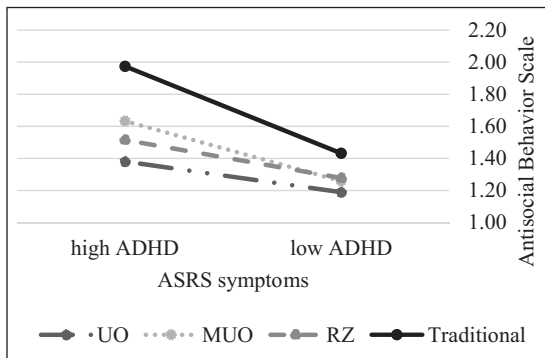
(iv) *Hypothesis 5: Negative attitudes towards ADHD will correlate with religiosity*

This hypothesis was supported for religious belonging but not for religious observance. Negative attitudes towards

ADHD differed significantly by religious group ( $F(4,802)=18.96, p<.001$ ). Post-hoc Scheffe analyses identified significant differences between the Ultra-Orthodox ( $M=2.63, SE=.04, n=191; p<.001$ ), the Religious Zionist group ( $M=2.24, SE=.05, n=192; p<.001$ ) and the secular group ( $M=2.17, SE=.04, n=180; p<.001$ ) as well as between the Modern Ultra-Orthodox

( $M=2.62, SE=.05, n=173, p<.001$ ) and all of the other groups.

In line with the importance of religious belonging for attitudes towards ADHD, negative attitudes towards ADHD were positively correlated with the Ultra-Orthodox Identity scale ( $r=-.26, p<.001, n=625$ ). Attitudes towards ADHD were not related to religious observance ( $r=.063, p=0.11, n=626$ ). Participants with ADHD held more negative attitudes towards ADHD than those without it ( $r=.22, p<.001$  and  $r=.019, p=.695$  respectively). However, only for Ultra-Orthodox participants with ADHD were these negative attitudes to ADHD also strongly correlated with emotional distress ( $r=.388, p<.001$ ).



**Figure 3.** Antisocial behaviour symptoms by ADHD symptoms for religious groups.

### Discussion

The findings of this study supported the posited additive-interactive model in which religiosity (a) correlates with lower levels of ADHD symptoms and diagnosis, (b) directly relates to less antisocial behaviour and less emotional distress and (c) moderates the negative effects of

**Table 3.** Hierarchical regression analyses for variables predicting emotional distress ( $N=626$ ).

Variable	Unstandardized coefficients		Standardized coefficients	t	
	B	SEB	B		
Step 1 (controls)	Gender	0.16	0.04	0.16	4.01***
	SES	-0.07	0.03	-0.11	-2.87**
Step 2	(Constant)	1.75	0.02		83.81***
	Traditional vs. others	-0.05	0.02	-0.12	-2.96**
	UO vs. MUO and RZ	-0.03	0.01	-0.09	-2.43*
Step 3	MUO vs. RZ	0.03	0.03	0.05	1.17
	(Constant)	1.74	0.02		91.88***
	Traditional vs. others	0.01	0.02	0.03	0.75
	UO vs. MUO and RZ	-0.01	0.01	-0.04	-1.04
	MUO vs. RZ	0.05	0.02	0.08	2.20*
Step 4	RO	-0.10	0.03	-0.16	-3.67***
	ASRS	0.28	0.02	0.42	11.76***
	(Constant)	1.78	0.03		65.96***
	Traditional vs. others	-0.01	0.02	-0.02	-0.28
	UO vs. MUO and RZ	0.00	0.02	0.00	0.09
	MUO vs. RZ	0.05	0.02	0.08	2.26*
	RO	-0.10	0.03	-0.15	-3.27***
	ASRS	0.30	0.03	0.45	11.40***
	RO* (traditional vs. others)	-0.04	0.02	-0.10	-1.91
	RO* (UO vs. MUO and RZ)	-0.04	0.02	-0.07	-1.82
	RO* (MUO vs. RZ)	-0.02	0.03	-0.02	-0.52
ASRS* (traditional vs. others)	-0.03	0.02	-0.06	-1.56	
ASRS* (UO vs. MUO and RZ)	-0.01	0.02	-0.03	-0.73	
ASRS* (MUO vs. RZ)	0.04	0.03	0.04	1.19	

Notes: (1) UO: Ultra-Orthodox; MUO: Modern Ultra-Orthodox; RZ: Religious Zionist; RO: religious observance; ASRS: ADHD self-report scale; (2) Control variables from step 1 were also included in steps 2, 3 and 4. \* $p<0.05$  \*\* $p<0.01$  \*\*\* $p<0.001$

ADHD on antisocial behaviour and emotional distress. Attitudes to ADHD were more negative among the most conservatively religious group than among other groups.

### *The negative correlation between ADHD and religiosity*

The lower prevalence of ADHD found among religious individuals in this study could be explained, as posited in the introduction, by higher religious attrition due to difficulties with effortful control (Mason, 2012; Mercer, 2011) or by a biased under-report and under-diagnosis of ADHD symptoms in religious communities due to mental health stigmas (Petee, 2019). A longitudinal tracking of changes in religious observance and belonging should be used for further testing of these accounts.

### *Religiosity as a moderator of the link between ADHD and antisocial behaviour*

Among the religious, ADHD posed less of a risk factor for antisocial behaviour than among less religious people. This moderation can be explained by theories of religious socialization, which contend that religious groups enforce stronger norms against antisocial behaviour and allow less scope for deviance (Hood et al., 2018). Clinical evidence associates ADHD with functional impairment reflected in long-term educational, social and occupational disadvantage (Klein et al., 2012; Lin et al., 2015), mental and physical health-related outcomes (Brook et al. 2013), antisocial behaviour and crime (Pratt et al., 2002). These associated features of the disorder are important treatment targets because each is associated with substantial burden to the individual and their family and community through the criminal justice, social and health systems.

This study further suggests that religious observance rather than religious belonging drives most of the moderating effect of religiosity, while religious belonging rather than religious observance drives negative attitudes towards ADHD. However, this needs to be further explored using additional outcome variables and measures of religious faith.

### *Implications for treatment of ADHD in conservative religious communities*

Our findings are also a call to treat individuals with ADHD in a more nuanced manner: Being an individual with ADHD in a highly religious society can be quite difficult, but it can also lead to better management of the disorder. The more the religious institution 'smooths' the interaction between ADHD and religious norms, the more likely it is that individuals with ADHD will become well-integrated into their religious community and will be able to reap the benefits of belonging and meaning without the deleterious

consequences of being stigmatized and censured. Possible interventions include cognitive-behavioural training aimed at enhancing effortful control and self-moderation, providing more information on ADHD to the community and encouraging religious leaders to consider that ADHD warrants religious mitigations, such as religiously permitted abbreviated prayer.

### *Design weaknesses and alternative interpretations of findings*

This study utilized self-report tools. Future research should use alternative measures of ADHD severity and antisocial behaviours, including community-based or in-person interviews to confirm the findings, as well as clinical diagnoses of ADHD in order to control for self-report confounds and to provide a broader model of religiosity in this context. Future research should also explore the role of social and family support and educational level in the relationship between ADHD, religiosity and antisocial behaviour.

Two additional limitations are the relatively young average age of participants in this study ( $M=26.5$ ;  $SD=10.2$ ), and the use of online recruitment methods that excludes those who eschew the internet. It should be noted that among the Ultra-Orthodox today, 67% have access to the internet through home connection or cell-phone, reflecting a significant increase in recent years (Nachshoni, 2020), but this is still below the general Israeli population average use of the internet at 89% (Cahaner & Malach, 2019). Further studies should target older populations and use additional surveying techniques. In sum, the currently used approaches of online recruitment and self-report might limit the confidence to extend the findings to the general population and to religious communities from different cultural backgrounds.

One of the questions left unresolved by our study is the question of directionality: Our model implies that more religiosity moderates the adverse effects of ADHD directly and indirectly. However, it is possible to construe ADHD as moderating the palliative effects of religiosity on psychosocial outcomes. A full model of the interaction between ADHD and religion should account for both causal directions, relating to the effects of ADHD on religious functioning and on the effects of religiosity on ADHD-related outcomes.

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### **Supplemental material**

Supplemental material for this article is available online.



## Notes

1. Despite nuanced academic typologies of actual religious practice in Israel (IDI (Israel Democracy Institute), 2011; Rosner & Fuchs, 2019) which often present Jewish observance as a continuum, many Jewish Israelis still consider observance to be dichotomous: one is either 'religious' or 'secular.' To ask those who self-define as secular to elaborate upon their religious observance can be construed as offensive. We therefore deemed it wise to omit the religious scale questions for those who self-defined as 'secular' to avoid unnecessary survey dropout rate.
2. Results using a dichotomous measure of ADHD are reported in the Supplemental Material.

## References

- Abdel-Khalek, A. M. (2014). Religiosity, health and happiness: Significant relations in adolescents from Qatar. *International Journal of Social Psychiatry, 60*(7), 656–661.
- Aguilar-Cárceles, M. M., & Farrington, D. P. (2017). Attention deficit hyperactivity disorder, impulsivity, and low self-control: Which is most useful in understanding and preventing offending? *Crime Psychology Review, 3*(1), 1–22.
- Aldwin, C. M., Park, C. L., Jeong, Y. J., & Nath, R. (2014). Differing pathways between religiousness, spirituality, and health: A self-regulation perspective. *Psychology of Religion and Spirituality, 6*(1), 9.
- Antonovsky, A. (1996). The salutogenic model as a theory to guide health promotion. *Health Promotion International, 11*(1), 11–18.
- Armon, Y. (2015). *The attitudes of teachers and students towards ADHD - Educational, social, emotional and behavioral aspects in relation to religiosity*. Unpublished Doctoral dissertation, School of Education, Bar Ilan University.
- Barkley, R. A. (Ed.). (2014). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment*. Guilford Publications.
- Baumeister, R. F., & Exline, J. (1999). Virtue, personality, and social relations: Self-control as the moral muscle. *Journal of Personality, 67*(6), 1165–1194.
- Ben Yair, Y., & Ronel, N. (2014). Immigrants in their own land: Haredi youth at risk and in social isolation. *Society and Welfare, 34*(1), 53–55.
- Brann, P., Lethbridge, M. J., & Mildred, H. (2018). The young adult strengths and difficulties questionnaire (SDQ) in routine clinical practice. *Psychiatry Research, 264*, 340–345.
- Brook, J. S., Brook, D. W., Zhang, C., Seltzer, N., & Finch, S. J. (2013). Adolescent ADHD and adult physical and mental health, work performance, and financial stress. *Pediatrics, 131*(1), 5–13.
- Cahaner, L., & Malach, A. (2019). *The yearbook of ultra-orthodox in Israel*. The Israel Democracy Institute.
- Central Bureau of Statistics. (2016). *Social survey 2016: Religiosity in Israel-characteristics of different groups*. The Israel Government.
- Cheung, C., & Yeung, J. W. (2011). Meta-analysis of relationships between religiosity and constructive and destructive behaviors among adolescents. *Children and Youth Services Review, 33*, 376–385.
- Ciftci, A., Jones, N., & Corrigan, P. W. (2013). Mental health stigma in the Muslim community. *Journal of Muslim Mental Health, 7*(1), 102.
- Dew, R. E., Daniel, S. S., & Koenig, H. G. (2007). A pilot study on religiousness/spirituality and ADHD. *International Journal of Adolescent Medicine and Health, 19*(4), 507–510.
- Elliott, D. S., & Ageton, S. S. (1980). Reconciling race and class differences in self-reported and official estimates of delinquency. *American Sociological Review, 45*, 95–110.
- Ellison, C. G., & Fan, D. (2008). Daily spiritual experiences and psychological well-being among US adults. *Social Indicators Research, 88*(2), 247–271.
- Faraone, S. V., Asherson, P., Banaschewski, T., Biederman, J., Buitelaar, J. K., Ramos-Quiroga, J. A., Rohde, L. A., Sonuga-Barke, E. J. S., Tannock, R., & Franke, B. (2015). Attention-deficit/hyperactivity disorder. *Nature Reviews Disease Primers, 1*, 15020.
- Fazel, S., Doll, H., & Långström, N. (2008). Mental disorders among adolescents in juvenile detention and correctional facilities: A systematic review and meta-regression analysis of 25 surveys. *Journal of the American Academy of Child & Adolescent Psychiatry, 47*(9), 1010–1019.
- Filip, D. D. (2005). *Initial clinical validation of the faith situation questionnaire*. Unpublished Doctoral dissertation, School of Psychology and Counselling, Regent University.
- Goodman, R. (1997). The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry, 38*(5), 581–586.
- Goodman, R. (2001). Psychometric properties of the strengths and difficulties questionnaire. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*, 1337–1345.
- Goshen-Phillip, S. (2016). *Fieldwork: ADHD as perceived by students and staff in the Haredi sector* [Unpublished MA thesis]. Lewinsky College.
- Guttman Center for Surveys. (2012). *A portrait of Israeli Jews: Beliefs, observance, and values of Israeli Jews, 2009*. Israel Democracy Institute.
- Hathaway, W. L., & Barkley, R. A. (2003). Self-regulation, ADHD & child religiousness. *Journal of Psychology & Christianity, 22*(2), 101–115.
- Hathaway, W. L., Douglas, D., & Grabowski, K. (2003). Faith situations questionnaire: Childhood normative data. *Journal of Psychology and Christianity, 22*, 141–154.
- Hood, R. W., Jr., Hill, P. C., & Spilka, B. (2018). *The psychology of religion: An empirical approach*. Guilford Publications.
- Hoza, B. (2007). Peer functioning in children with ADHD. *Journal of Pediatric Psychology, 32*(6), 655–663.
- IDI (Israel Democracy Institute). (2011). *A portrait of Israeli Jews*. The Israel Democracy Institute and AVI CHAI Israel Foundation.
- Kelly, P. E., Polanin, J. R., Jang, S. J., & Johnson, B. R. (2015). Religion, delinquency, and drug use: A meta-analysis. *Criminal Justice Review, 40*(4), 505–523.
- Kessler, R. C., Adler, L. A., Ames, M., Demler, O., Faraone, S., Hiripi, E., & Walters, E. E. (2005). The World Health Organization adult ADHD self-report scale (ASRS): A short screening scale for use in the general population. *Psychological Medicine, 35*, 245–256.

- Kessler, R. C., Adler, L., Barkley, R., Biederman, J., Conners, C. K., Demler, O., & Spencer, T. (2006). The prevalence and correlates of adult ADHD in the United States: Results from the National Comorbidity Survey Replication. *American Journal of Psychiatry*, *163*(4), 716–723.
- Klein, R. G., Mannuzza, S., Olazagasti, M. A. R., Roizen, E., Hutchison, J. A., Lashua, E. C., & Castellanos, F. X. (2012). Clinical and functional outcome of childhood attention-deficit/hyperactivity disorder 33 years later. *Archives of General Psychiatry*, *69*(12), 1295–1303.
- Kok, F. M., Groen, Y., Fuermaier, A. B., & Tucha, O. (2016). Problematic peer functioning in girls with ADHD: A systematic literature review. *PLoS One*, *11*(11), e0165119.
- Laird, R. D., Marks, L. D., & Marrero, M. D. (2011). Religiosity, self-control, and antisocial behavior: Religiosity as a promotive and protective factor. *Journal of Applied Developmental Psychology*, *32*(2), 78–85.
- Lebowitz, M. S. (2016). Stigmatization of ADHD: A developmental review. *Journal of Attention Disorders*, *20*(3), 199–205.
- Lee, S. S., Lahey, B. B., Owens, E., & Hinshaw, S. P. (2008). Few preschool boys and girls with ADHD are well-adjusted during adolescence. *Journal of Abnormal Child Psychology*, *36*(3), 373–383.
- Li, K. (2013). Religion and medicalization: The case of ADHD. *Journal for the Scientific Study of Religion*, *52*(2), 309–327.
- Lin, Y. J., Lo, K. W., Yang, L. K., & Gau, S. S. F. (2015). Validation of DSM-5 age-of-onset criterion of attention deficit/hyperactivity disorder (ADHD) in adults: Comparison of life quality, functional impairment, and family function. *Research in Developmental Disabilities*, *47*, 48–60.
- Mason, P. B. (2012). *The relationship between religion and attention deficit hyperactivity disorder* [Unpublished Doctoral dissertation]. Mississippi State University.
- McCullough, M. E., & Willoughby, B. L. (2009). Religion, self-regulation, and self-control: Associations, explanations, and implications. *Psychological Bulletin*, *135*, 69–93.
- Mercer, J. A. (2011). Attending to children, attending to god: Children with ADHD and Christian spirituality. *Journal of Childhood and Religion*, *2*(7), 1–38.
- Mohr-Jensen, C., & Steinhausen, H. C. (2016). A meta-analysis and systematic review of the risks associated with childhood attention-deficit hyperactivity disorder on long-term outcome of arrests, convictions, and incarcerations. *Clinical Psychology Review*, *48*, 32–42.
- Nachshoni, K. (2020). *The Corona effect among the ultra-orthodox: A 39% leap in connecting to the internet*. YNET. Retrieved December 24, 2020, from <https://www.ynet.co.il/judaism/article/SJQf5NYQv>
- Park, C. L. (2017). Religious cognitions and well-being: A meaning perspective. In M. Robinson & M. Eid (Eds.), *The happy mind: Cognitive contributions to well-being*. Springer.
- Park, C. L., Edmondson, D., & Hale-Smith, A. (2013). Why religion? Meaning as motivation. In K. I. Pargament, J. J. Exline & J. W. Jones (Eds.), *APA handbook of psychology, religion, and spirituality (Vol. 1): Context, theory, and research* (pp. 157–171). American Psychological Association.
- Peteet, J. R. (2019). Approaching religiously reinforced mental health stigma: A conceptual framework. *Psychiatric Services*, *70*(9), 846–848.
- Pirutinsky, S. (2014). Does religiousness increase self-control and reduce criminal behavior? A longitudinal analysis of adolescent offenders. *Criminal Justice and Behavior*, *41*(11), 1290–1307.
- Polanczyk, G. V., Willcutt, E. G., Salum, G. A., Kieling, C., & Rohde, L. A. (2014). ADHD prevalence estimates across three decades: An updated systematic review and meta-regression analysis. *International Journal of Epidemiology*, *43*(2), 434–442.
- Pratt, T. C., Cullen, F. T., Blevins, K. R., Daigle, L., & Unnever, J. D. (2002). The relationship of attention deficit hyperactivity disorder to crime and delinquency: A meta-analysis. *International Journal of Police Science & Management*, *4*(4), 344–360.
- Purwono, U., French, D. C., Eisenberg, N., & Christ, S. (2019). Religiosity and effortful control as predictors of antisocial behavior in Muslim Indonesian adolescents: Moderation and mediation models. *Psychology of Religion and Spirituality*, *11*(1), 55–64.
- Reisig, M. D., Wolfe, S. E., & Pratt, T. C. (2012). Low self-control and the religiosity-crime relationship. *Criminal Justice and Behavior*, *39*(9), 1172–1191.
- Rosner, S., & Fuchs, C. (2019). *#IsraeliJudaism: Portrait of a cultural revolution*. The Jewish People Policy Institute.
- Ryan, J., Ross, S., Reyes, R., Kosmerly, S., & Rogers, M. (2016). Social functioning among college students diagnosed with ADHD and the mediating role of emotion regulation. *Emotional and Behavioural Difficulties*, *21*(4), 387–402.
- Schnitker, S. A., & Emmons, R. A. (2007). Patience as a virtue: Religious and psychological perspectives. In *Research in the social scientific study of religion* (Vol. 18, pp. 177–207). Brill.
- Schoepfer, A., Reitzel, J. D., & Norris, A. (2019). Low self-control and ADHD: Similar yet different concepts in the study of crime. *Journal of Crime and Justice*, *42*(3), 288–299.
- Slobodin, O., & Masalha, R. (2020). Challenges in ADHD care for ethnic minority children: A review of the current literature. *Transcultural Psychiatry*, *57*(3), 468–483.
- Sobanski, E. (2006). Psychiatric comorbidity in adults with attention-deficit/hyperactivity disorder (ADHD). *European Archives of Psychiatry and Clinical Neuroscience*, *256*(1), i26–i31.
- Wesselmann, E. D., & Graziano, W. G. (2010). Sinful and/or possessed? Religious beliefs and mental illness stigma. *Journal of Social and Clinical Psychology*, *29*(4), 402–437.
- Whitehead, A. L. (2018). Religion and disability: Variation in religious service attendance rates for children with chronic health conditions. *Journal for the Scientific Study of Religion*, *57*(2), 377–395.
- Willcutt, E. G. (2012). The prevalence of DSM-IV attention-deficit/hyperactivity disorder: A meta-analytic review. *Neurotherapeutics*, *9*(3), 490–499.
- Yaakovson, S. (2008). *The attitudes of at-risk Haredi youth towards law breaking* [Unpublished MA thesis in social work]. The Hebrew University.
- Young, S., Moss, D., Sedgwick, O., Fridman, M., & Hodgkins, P. (2015). A meta-analysis of the prevalence of attention deficit hyperactivity disorder in incarcerated populations. *Psychological Medicine*, *45*(2), 247–258.
- Zohar, A., & Konfortes, H. (2010). Diagnosing ADHD in Israeli adults: The psychometric properties of the adult ADHD self-report scale (ASRS) in Hebrew. *The Israel Journal of Psychiatry and Related Sciences*, *47*(4), 308.