

Maternal and Personal Religious Engagement as Predictors of Early Onset and Frequent Substance Use

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Background and Objective: This study examined whether maternal and offspring's religiosity independently predict age of onset and frequency of substance use in offspring, and whether gender differentiates these associations.

Methods: Data were from the Mater Hospital and University of Queensland Study of Pregnancy, a birth cohort study. Participants were a cohort of 3,537 persons who were born during 1981–83 and were followed-up to 21 years. Odds ratio (OR) and 95% confidence interval (CI) were used to estimate relative risk of substance use.

Results: Both maternal and offspring's religious practice were associated with later onset and less frequent substance use. After adjustment for potential confounding and maternal religious background, offspring who were not attending church were more likely to report early onset of tobacco smoking (OR = 5.1; 95% CI: 2.8–9.4), alcohol drinking (OR = 17.4; 95% CI: 8.9–33.9) and cannabis use (OR = 7.5; 95% CI: 3.4–16.0).

Discussion and Conclusions: Findings of this study suggest family and personal religious practices are predictors of less substance use problems in adolescents and young adult males and females.

Scientific Significance and Future Directions: Religious engagement functions as a deterrent to adolescent tobacco, alcohol, and cannabis use. (*Am J Addict* 2014;23:363–370)

suggest that religious beliefs and participation are associated with decreased morbidity and mortality.^{2–5} Research has also demonstrated a relationship between religiosity and general well-being, mental health and substance use and abuse. Being reared in a religious family has been associated with lower levels of substance use and abuse. For example, parental religiosity, as measured by church attendance and perceived importance of attendance, predicts lower rates of adolescence alcohol use.⁶ There is, however, a need for research to explore whether family religious background and/or personal religious practices are independent predictors of offspring's substance use and whether this relationship can be otherwise explained by other confounding variables.

The impact of religious involvement on human health and behavior have, for long time, been the focal point of research.⁷ However, the impact of religiosity on substance use in young adults is less investigated.⁸ While the relationship between religious affiliation and substance use does not seem to be very strong,⁹ existing literature indicates that religious practices such as church/synagogue attendance, prayer, and scripture reading tend to be inversely associated with substance use and abuse. For example, in a prospective study of French teenagers, Weill and Le Bourhis¹⁰ found that teenagers who were docile, contented, and religious were less likely to smoke tobacco 5 years later. In another study, high school students who rarely attended church were more likely to drink more alcohol than students who attended church more often.¹¹ More recent population-based studies^{12–14} have reported that the level of general religiosity was inversely linked with substance abuse and dependence. In a representative sample of 20,130 adults in the U.S., Robinson et al.¹⁴ found that infrequent religious attendance was associated with substance use disorders.

However, adolescence and early adulthood are early stages of psycho-social development, with religious belief and practices a component of this developmental process.¹⁵ In

INTRODUCTION

Substance use in adolescence and early adulthood are common public health concerns in Australia. In the most recent national survey almost 13.0% and 21.0% of Australian aged 18–19 years reported smoking tobacco and cannabis in 2010, respectively.¹ Several systematic reviews and meta-analyses

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addition, initiation to use of substances usually occurs in early adolescence and evolves into abuse and dependence in early adulthood.¹⁶ Research has shown that onset of substance use in early adolescence predicts subsequent illicit drug use and abuse.¹⁷ There have been a few studies that prospectively examined the association between parental religiosity and offspring's substance use.^{18,19} In these studies, adolescent's perceptions of parental religiosity was inversely associated with offspring's substance use. In a 2-year longitudinal study of 12- to 14-year-old adolescents in the United States, Foshee and Hollinger⁶ found that maternal religiosity at the baseline predicted lower rate of alcohol use in children 2 years later. Notwithstanding, there remains a need for a long-term longitudinal study to examine relationship between parental religiosity and an individual's own religious engagement and substance use in adolescence and young adulthood.

Further, studies of religious beliefs and behavior have demonstrated that females are more religious than males, regardless of the type of religious organization or belief system.^{20,21} Consistent with the above finding, a review of empirical research suggests that early initiation to substance use and its prevalence is higher among males than females.²² It is important to determine whether the association of parental religious background and youth religious practices and substance use problems are gender specific.

Despite existing research linking religiosity and substance use, there are some limitations in the literature that warrant further investigation. Firstly, the data are mostly collected cross-sectionally, so it is not possible to know the temporality of observed associations. Secondly, most available studies have either focused on either parental or personal religiosity. There is a need to compare the impact of parental religious background with the youth personal current religious belief and practice. Further, previous investigations have failed to control for potential confounding factors such as socio-demographic characteristics, parental mental health, and parental substance use.

This article reports data from a prospective birth cohort study to examine: (1) the association of parental religious background when the child was born and offspring's religious beliefs and practices and offspring's early initiation to use of tobacco, alcohol, and cannabis, and frequency of use of these substances in early adulthood; (2) if the associations are independent of the impact of potential confounding factors; and (3) whether there are gender differences in the association between religiosity and an individual's substance use.

METHODS AND MATERIALS

Study Population

Data for this study were taken from the Mater-University of Queensland Study of Pregnancy (MUSP), a pre-birth cohort study which recruited pregnant women attending one of two major obstetric hospitals in Brisbane, Australia.^{23,24} Baseline data were collected at the first antenatal visit from 7,223

consecutive women (1981–83) who gave birth to a live singleton baby and were followed up at 3–5 days, 6 months, and 5, 14, and 21 years after the birth. Both mothers and their children were assessed at the follow-ups. The present analyses used data from both mothers and children from the baseline to 21-year follow-up survey. Written informed consent from each mother was obtained at all phases of data collection and from each young adult at the 21-year follow-up of the study. All phases of the MUSP have been approved by Ethics Committees of The University of Queensland and Mater Hospital.

Measurements

Maternal and Young Adult Religiosity

Maternal religiosity was measured before the child was born. At their first clinic visit, pregnant women were asked: "What is your present religion?". They were then divided into two groups: having any religion and no religion. In a second question, the women indicated whether they believe in God or not. A third question asked "How often do you go to church?", options were: weekly, monthly, less than once a month and never.

At the 21-year follow-up, the offspring were asked two questions. The first question asked "Do you believe in God?", options were no, yes, and do not know. They were also asked "How often do you go to church?". The participants were then divided into three groups: weekly, less than or once a month, and never.

Substance Use

The extent of smoking and drinking by young adults at the 21-year follow-up was assessed via self-report. Subjects were divided into three categories: non-smokers, smokers of less than 10 cigarettes per day and 10 or more cigarettes per day (for smoking), and less than half drink (glass), half to two drinks and more than two drinks per day (for alcohol consumption). Current cannabis use by the participants was assessed at the 21-year follow-up via a self-report questionnaire in which they were asked, "In the last month how often did you use cannabis, marijuana, pot, etc.?" Options for response were: have never used before, used but not in the last month, used once or so in the last month, used every few days and used every day. Young adults were then divided into three groups, never used; occasional use; and frequent use (used at least every few days). All participants were also asked three additional questions about their age at first use of cigarette, alcohol, and cannabis. Consistent with previous research¹⁷ 15 years of age was used as a cut-off point below which it was considered evidence of early onset.

Other Variables

Gender of child was taken from hospital records. Maternal socio-demographic background, including age (below 20 and 20 years or older); and education (post high school, completed high school, and incomplete high school) were assessed when the child was born. Mother's cigarette smoking was assessed at

all phases of the study according to the number of the cigarettes mothers reported they smoked over the 7 days prior to the survey (non-smoker, smoking 1–19, and 20+ cigarettes per day). We also obtained information on frequency (from never to daily) and quantity (from 0 to 7+ glasses) of alcohol consumption. They were then divided into three categories (abstainers, ≤ 1 glass, and > 1 glass per day).

Maternal anxiety and depression at the 5-year follow-up were assessed using the short form of the Delusions-Symptoms-States Inventory (DSSI).²⁵ The DSSI has been widely used and its validity has been established²⁶ against the DSM-III.²⁷ In the MUSP, the DSSI items were administered to the mother in the form of a self-report questionnaire, which included the seven-item anxiety (Cronbach's $\alpha = .76$) and depression (Cronbach's $\alpha = .79$) sub-scales.

Statistical Analysis

According to age of onset of substance use, participants were divided into three groups: those who never used before, those who began using at or before 15 years, and those who started using a substance after 15 years. We used chi-square tests and logistic regression to estimate the risk (expressed as the odds ratio [OR] and 95 percent confidence interval [95% CI]) of young adults' pattern of substance use and age of onset of substance use for each independent variable. As the outcome variables consisted of more than two categories, we analyzed the data using multinomial logistic regression.²⁸ First, we used univariate logistic regression models to examine unadjusted association between maternal and personal religiosity and substance use problem (Table 2). In addition, we developed a multivariate model including a selected group of potential confounders such as mother's age and education, mother's mental health and mother substance use (Table 3). In the first adjusted model, we controlled the association of both maternal and personal religiosity, and substance use for participant's gender and interaction of gender and religious variables. As there was no significant gender interaction in the associations, we present the data for the whole sample (data are not shown). Finally, we conducted additional adjusted logistic regression including all independent variables as well as potential confounders in the same model (Table 4).

RESULTS

Descriptive Findings

Participants had mean age of 20.6 (ranged 18.2–23.6) years. The vast majority (92.5%) were of Caucasian background, 3.5% and 3.9% had at least an Asian or Aboriginal and Torres Strait Islander parent, respectively. Some 79.7% of mothers and 47.8% of offspring believed in God. Some 16.4% of mothers compared to 8.0% of offspring reported weekly church attendance, while 58.8% and 76.7% of children were not going to church at all. Of 3,537 young adults (47.5% male, 52.5% female), 36.4% reported smoking cigarettes, 17.9% reported they were drinking more than two standard drinks per day, and 49.3% reported having ever used cannabis. A

substantial proportion of participants reported onset of smoking (15.3%), alcohol consumption (17.5%), and cannabis use (12.2%) before 15 years. There was no significant difference between males and females in rate of early onset of smoking and drinking. However, males were significantly more likely to begin cannabis use before 15 years ($p < .01$). In addition, frequent smoking, drinking, and cannabis use were more common in young adult males than females ($p < .001$).

Maternal and Personal Religiosity, and Substance Use

There was a strong association between the mother's belief in God and church attendance at the baseline and their offspring's (now young adults) belief in God and church attendance at the 21-year follow-up. There was a modest but significant correlation (Spearman's $\rho = .15$, $p < .001$) between mother's belief in God and church attendance, but a non-significant correlation between offspring's belief in God and church attendance. Age of initiation to cigarette smoking and cannabis use were strongly correlated, but there was a negative association between age of onset of alcohol consumption, and that of tobacco and cannabis use. Table 1 shows the prevalence of young adults' age of onset and frequency of substance use according to their mothers and own religiosity.

Table 2 presents the results of unadjusted association between maternal and offspring religiosity and early onset and frequent use of substances. For this analysis, risk of both early onset and frequent use of three substances is estimated, with never use of tobacco, $< .5$ glass of alcohol per day and never use of cannabis being reference categories. Unadjusted associations show that maternal belief in God at the baseline was not associated with offspring's substance use in adolescence and early adulthood. However, mothers who never went to church compared to those who attended church weekly were significantly more likely to have their children initiate tobacco smoking (OR = 2.1; 95% CI: 1.5–2.8), alcohol consumption (OR = 4.9; 95% CI: 3.3–7.2) or cannabis use (OR = 2.3; 95% CI: 1.7–3.3) at or before 15 years or frequently using substances in early adulthood. The data also show that offspring who believed in God were between .3 time (for alcohol) and .7 times (for tobacco) less likely to begin substance use at early age or frequently use cannabis in early adulthood. Offspring's religious practice as measured by church attendance strongly predicted lower risk of substance use.

The second specific objective of this study was to examine if the relationship between maternal and personal religiosity and substance use is independent of potential confounding factors. Table 3 presents the findings of adjusted associations controlled for participant's gender, maternal age and education, maternal mental health (anxiety and depression), and maternal substance use (smoking and drinking) measured at the baseline. As the strength of association between maternal and offspring's religiosity and substance use behaviors were not materially different between males and females, and there was no significant interaction between gender and either

TABLE 1. Maternal and personal religiosity, and substance use in adolescence and early adulthood

Baseline variables	N	Age of initiation to use			Substance use at 21-year follow-up								
		Early onset (<15 years)			Smoking			Drinking			Cannabis		
		Tobacco	Alcohol	Cannabis	None	<10	10+	<.5	.5–2.0	>2.0	Never	Occasional	Frequent
Maternal belief in God													
No	144	20.1	20.1	16.0	61.1	16.7	22.2	45.8	38.9	15.3	50.7	30.6	18.7
Yes	2,818	14.6	17.4	11.6	64.0	18.0	18.0	44.6	37.7	17.7	51.0	37.4	11.6
Do not know	575	17.4	17.7	14.4	62.4	14.8	22.8	45.2	35.7	19.1	49.0	35.3	15.7
Maternal church going													
Weekly	580	10.2	14.0	7.6	71.1	15.7	13.2	44.3	40.0	15.7	56.0	8.5	31.5
≤Once a month	876	15.5	17.2	11.3	65.5	18.0	16.5	44.0	35.5	18.5	50.1	11.6	38.2
Never	2,081	16.6	18.6	13.9	58.4	17.8	23.8	47.8	36.0	16.2	45.8	14.4	39.8
21-year follow-up	N	Age of initiation to use			Substance use at 21-year follow-up								
		Early onset (<15 years)			Smoking			Drinking			Cannabis		
		Tobacco	Alcohol	Cannabis	None	<10	10+	<.5	.5–2.0	>2.0	Never	Occasional	Frequent
Personal belief in God													
No	870	17.1	21.3	15.8	59.1	16.5	24.4	41.1	38.3	20.6	46.4	36.2	17.4
Yes	1,690	13.1	15.4	10.2	66.6	17.6	15.7	48.3	35.9	15.8	54.1	35.7	10.1
Do not know	977	17.4	17.8	12.6	62.4	17.7	19.9	41.9	39.2	18.9	48.5	39.1	12.4
Personal church going													
Weekly	283	4.6	7.4	2.8	91.2	5.3	3.5	78.8	18.4	2.8	85.9	13.4	.7
≤Once a month	540	12.6	12.8	8.0	65.6	19.4	15.0	44.8	38.7	16.5	50.9	40.2	8.9
Never	2,714	16.9	19.5	14.1	60.4	18.2	21.4	41.2	39.1	19.7	47.0	38.5	14.5

Data are % within each category of independent variables; smoking cigarettes: number per day (none, <10, 10+); drinking: number of glasses per day (<.5, .5–2.0, >2.0); cannabis: days used in the last month (never used, occasionally, frequently).

maternal or personal religiosity, the findings are not presented separately for male and female offspring. Adjusted for a selected group of potential confounders, maternal church attendance at the baseline remained significantly associated with risk of early onset and frequent substance use in offspring, although the effect size of associations were reduced. Consistent with the data in Table 2, participants who were not attending church compared to those who were attending weekly were much more likely to have reported early onset of tobacco smoking (OR = 5.2; 95% CI: 2.9–9.2), alcohol drinking (OR = 21.5; 95% CI: 12.2–37.7) or cannabis use (OR = 7.3; 95% CI: 3.5–14.9), or report frequent substance use in early adulthood.

In addition to multivariate association presented in Table 3, we conducted a series of logistic regression including maternal church attendance, personal belief in God and personal church attendance as well as all potential confounders in the same model (see Table 4). In the fully adjusted model only participant’s church attendance remained significantly associated with early onset and frequent use of substance use. The data show that after controlling for maternal religious activity and other potential confounders such as mother’s age and education, mother’s substance use and mental health, offspring who did not attend church at all or attended less frequently compared to those who attended church weekly were at

significantly increased risk of early onset of tobacco smoking, alcohol drinking and cannabis use. They were also much more likely to frequently smoke cigarettes, drink alcohol or use cannabis in early adulthood.

DISCUSSION

These data suggest both maternal and personal religious engagement as predictors of lower risk of early onset and frequent substance use. When examined separately, level of religious engagement as measured by church attendance by both mothers and children was inversely associated with early onset and frequent substance use in children. This effect was not explained by a selected group of potential confounders. However, when both maternal and offspring’s religious practice were included in the same model, maternal religious beliefs and practices were less important to offspring’s own religiosity. In fact, the data suggest that belief in God is less important than the level of religious engagement. In addition, although females were more religious and less likely to be using substances, our data indicate that the association of religious involvement and substance use is not gender specific.

Findings of this multivariate study support previous investigations which have found an association between either

TABLE 2. Risk of early onset and frequent substance use according to maternal and personal religiosity

Baseline variables	Early onset (<15 years)			Frequent substance use at 21-year follow-up		
	Tobacco	Alcohol	Cannabis	Tobacco	Alcohol	Cannabis
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Maternal belief in God						
No	1.0	1.0	1.0	1.0	1.0	1.0
Yes	.7 (.5–1.1)	1.1 (.5–2.2)	.7 (.4–1.1)	.8 (.5–1.2)	1.2 (.7–1.9)	.6 (.4–1.0)
Do not know	.9 (.5–1.4)	1.9 (.8–4.7)	.9 (.5–1.5)	1.0 (.6–1.6)	1.3 (.7–2.1)	.9 (.5–1.4)
Maternal church going						
Weekly	1.0	1.0	1.0	1.0	1.0	1.0
≤Once a month	1.9 (1.3–2.6)	4.2 (2.6–6.9)	1.9 (1.3–2.8)	2.1 (1.5–2.9)	1.9 (1.4–2.6)	1.6 (1.1–2.3)
Never	2.1 (1.5–2.8)	4.9 (3.3–7.2)	2.3 (1.7–3.3)	2.7 (2.0–3.7)	1.7 (1.3–2.2)	2.0 (1.5–2.8)
21-year follow-up	Early onset (<15 years)			Frequent substance use at 21-year follow-up		
	Tobacco	Alcohol	Cannabis	Tobacco	Alcohol	Cannabis
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Personal belief in God						
No	1.0	1.0	1.0	1.0	1.0	1.0
Yes	.7 (.5–.8)	.3 (.2–.5)	.6 (.4–.7)	.6 (.5–.7)	.6 (.5–.8)	.5 (.4–.6)
Do not know	1.0 (.8–1.3)	1.4 (.8–2.4)	.8 (.6–1.0)	.8 (.6–1.0)	.9 (.7–1.1)	.7 (.5–.9)
Personal church going						
Weekly	1.0	1.0	1.0	1.0	1.0	1.0
≤Once a month	4.5 (2.4–8.3)	9.9 (5.1–19.3)	4.8 (2.2–10.3)	5.9 (3.0–11.6)	10.2 (4.8–21.6)	21.2 (5.1–88.1)
Never	6.5 (3.7–11.5)	24.3 (14.2–41.5)	9.2 (4.5–18.7)	9.1 (4.8–17.3)	13.3 (6.5–27.2)	37.5 (9.2–151.0)

Never use of substance considered reference category.

TABLE 3. Adjusted risk of early onset and frequent substance use according to maternal and personal religiosity¹

Baseline variables	Early onset (<15 years)			Frequent substance use at 21-year follow-up		
	Tobacco	Alcohol	Cannabis	Tobacco	Alcohol	Cannabis
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Maternal church going						
Weekly	1.0	1.0	1.0	1.0	1.0	1.0
≤Once a month	1.5 (1.1–2.2)	3.6 (2.2–6.0)	1.5 (1.1–2.2)	1.6 (1.1–2.2)	2.0 (1.4–2.8)	1.4 (1.0–2.1)
Never	1.5 (1.1–2.1)	4.3 (2.8–6.6)	1.7 (1.2–2.5)	1.8 (1.3–2.5)	1.7 (1.2–2.3)	1.7 (1.2–2.4)
21-year follow-up	Early onset (<15 years)			Frequent substance use at 21-year follow-up		
	Tobacco	Alcohol	Cannabis	Tobacco	Alcohol	Cannabis
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Personal belief in God						
No	1.0	1.0	1.0	1.0	1.0	1.0
Yes	.7 (.6–.9)	.4 (.2–.6)	.6 (.5–.8)	.7 (.5–.9)	.8 (.6–1.0)	.6 (.4–.7)
Do not know	1.0 (.8–1.4)	1.4 (.7–2.5)	.8 (.6–1.0)	.8 (.7–1.1)	1.0 (.8–1.3)	.7 (.5–1.0)
Personal church going						
Weekly	1.0	1.0	1.0	1.0	1.0	1.0
≤Once a month	4.1 (2.2–7.7)	9.3 (4.7–18.4)	3.9 (1.8–8.5)	5.1 (2.6–10.1)	10.1 (4.7–21.5)	17.9 (4.3–74.8)
Never	5.2 (2.9–9.2)	21.5 (12.2–37.7)	7.3 (3.5–14.9)	6.5 (3.4–12.5)	13.6 (26.0–28.1)	30.6 (7.5–124.2)

Never use of substance considered reference category; the data for maternal belief in God are not presented as it was not significantly associated with offspring's substance use in the multivariate model; ¹adjusted for participant's gender, mother's age and education, mother's mental health (anxiety and depression), and mother substance use (cigarette smoking and alcohol drinking).

TABLE 4. Adjusted risk of early onset and frequent substance use according to personal church attendance¹

	Early onset (<15 years)			Frequent substance use at 21-year follow-up		
	OR (95% CI)	Alcohol OR (95% CI)	Cannabis OR (95% CI)	Tobacco OR (95% CI)	Alcohol OR (95% CI)	Cannabis OR (95% CI)
Personal church going at 21-year follow-up						
Weekly	1.0	1.0	1.0	1.0	1.0	1.0
≤Once a month	4.1 (2.2–7.7)	8.3 (4.1–16.8)	4.0 (1.8–8.9)	4.9 (2.4–9.8)	10.0 (4.7–21.5)	18.9 (4.5–79.3)
Never	5.1 (2.8–9.4)	17.4 (8.9–33.9)	7.5 (3.5–16.0)	5.8 (2.9–11.3)	14.6 (6.9–30.9)	31.8 (7.8–131.8)

Never use of substance considered reference category; ¹adjusted for participant's gender, mother's age and education, mother's mental health, and mother substance use, as well as maternal church attendance and personal belief in God; the data for maternal belief in God, maternal church attendance and offspring's belief in God are not presented as they were not significantly associated with offspring's substance use in the fully adjusted model.

family religious practices^{6,18,19} or personal religiosity^{10–12,29,30} and development of offspring's substance use problems. However, some of the previous studies have not controlled for potentially important confounding factors, such as family socio-economic background. Furthermore, most studies have not controlled for the association between young adults' religiosity and substance use for parental religiosity. Our findings are consistent with Burkett¹⁹ and Chadwick and Top³¹ who found a significant effect of adolescent religiosity on their alcohol use, even after controlling for parental religiosity.

This study contributes to the literature in several ways. First, it is based on a large long-term longitudinal birth cohort that has data on a wide range of potential confounding factors. Having considered a very long term interval between assessment of maternal religiosity (before the child birth) and offspring's substance use in early adulthood, this study is novel in supporting the hypothesis that family religiosity protects children against substance use problems. Second, available data on both maternal and own religious engagement allows an examination of the independent effect of each of these factors on children's substance use. To our best of knowledge, this has not been addressed in the previous investigation. Further, the study examined the possible association between religiosity and both licit and illicit substances in both males and females.

Mechanisms of Association

It might be argued that the observed association is due to other background factors that are related to both maternal and personal religiosity, and offspring's substance use. Given the present analysis controlled for a selected group of potential confounders and strength of association, this possibility has been reduced. One potential explanation for the protective effect of maternal religiosity might be that religious families define their moral values, encourage moral concepts in their children and influence their attitudes of resilience against drug use.³² The observed association between religiosity and less substance use in young people might be understood through primary socialization theory argued by Oetting et al.^{33,34} They propose that social norms, including deviant behavior and substance use, are learnt from specific primary sources such as the family, the school, and peer clusters. Oetting et al.,³³ claim

that religion promotes resilience in adolescence as religion shapes the "primary socialization sources" surrounding an adolescent, specifically family, peers, and school. According to this theory, young people with more religious engagement have peers who do not use substances, attend a school with activities not involving substances, and are reared in families, in which parents socialize without use of substances such as alcohol. In this view, it is not religious participation itself that is important but the social and environmental consequences of that participation.

Another theory that may explain the association between religiosity and substance use is social control³⁵; it is suggested that emotional attachments to peers who use substances is a primary cause of substance use in adolescents and young adults. In this theory, individual's behaviors are often controlled by strong bonds to the conventional society, families, schools, and religions. Parents who are more religious may dictate more restrictive rules governing problem behaviors, including adolescent substance use.³⁶ Further, those who are strongly committed to religious practices probably associate with others holding similar views. Thus, the strongly religious children are less likely to affiliate with peer groups that encourage experimentation with cigarettes, alcohol, and other drugs and more likely to participate in peer networks and activities that do not involve drugs. Given the strong relationship between drug use by peers and an adolescent's own drug use, the norms of the peer group are especially important as predictors of whether a particular person will start using drugs in adolescence.³⁷

An alternative explanation for the link between religiosity and substance use in young people might be attributed to the effect of religiosity on stress-coping strategies. Research indicates that young people may use substance as mean to cope with stress attributed to untreated underlying problems, the so called self-medication hypothesis.³⁸ On the other hand, religious involvement is associated with enhanced social support, and greater social support improves mental health. Therefore, it may be suggested that religious engagement can buffer the impact of stress on substance use.³⁹ In the present study, the association between maternal religiosity and offspring's substance use is mainly explained by offspring's own religious practice, suggesting that the impact of maternal

religiosity on children's substance use is indirect via children's religiosity. Notwithstanding these theoretical contributions, the specific mechanisms of association between religiosity and lower rates of substance use are yet to be adequately identified and empirically tested.

Limitations

Some limitations should be noted when considering the findings presented here. First, as with almost all population-based cohort studies, there has been attrition from the original cohort. Loss to follow-up at different follow-up times was likely to be associated with lower socio-economic status and the younger age of the mother at the birth of the child (<20 years). These women were also more likely to experience mental health problem and use substances than those women remaining in the study. However, the results would be misleading if the associations examined either did not exist or were in the opposite direction to non-participants⁴⁰ and this is not the case.

Second, this study is limited to women and their children; we could not control the observed associations for paternal potential confounding factors such as mental health and substance use. In addition, age of initiation to use and frequency of use of substances were measured at the 21-year follow-up by self-report. Questions about the validity of self-report measures of substance use frequently are raised.⁴¹ The measures used in the present study to improve the accuracy of responses included the assurance of confidentiality and administration of the questionnaire in a private location. There may also be concern about measurement bias when the onset of drug use has begun long before the measurement. However, previous studies have suggested that self-reports of substance use are generally valid and reveal more use than laboratory tests and collateral reports from family members.⁴²

A third limitation relates large confidence intervals for some of the associations presented in Tables 2–4. Although the effect sizes of those associations are very strong, small numbers of people in respective categories have led to very wide confidence intervals.

CONCLUSION

Tobacco smoking, alcohol drinking, and cannabis use is relatively common in young Australians, and our findings indicate that about one in five young persons have begun smoking cigarettes or cannabis use before 15 years of age. Our data suggest that family religious background and primarily personal religious practice have strong protective effect on risk of early onset and frequent use of substances in young people.

Scientific Significance and the Future Directions

Given the strength of association and similar findings in previous research, it seems plausible to consider a causal association between religiosity and substance use. Other studies have described several pathways to drug use in

adolescents and young adults. We recommend further investigation to explore how pathways of drug use are connected to religious engagement.

Declaration of Interest

The authors have no conflict of interest.

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