

Religious Values, Practices and Pregnancy Outcomes: A Comparison of the Impact of Sect and Mainstream Christian Affiliation

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Abstract

In this report 6566 women enrolled in the Mater-University of Queensland Study of Pregnancy (MUSP) were separated into three groups; members of religious sects, Christians who attend church frequently and Christians who are infrequent attenders. These three groups, respectively labelled Christian sects, Christian attenders and lukewarm Christians were compared on a number of social background, lifestyle and pregnancy outcome variables.

The sect members appeared to have the most favourable health, lifestyles and healthy babies at delivery, though this latter finding appears attributable to specific characteristics of the mother and her lifestyle. On most measures the children of lukewarm Christians appear to manifest the worst health while Christian attenders form a group whose children's health is between that of sect members and lukewarm Christians.

Keywords: religion, pregnancy, lifestyle, birthweight

Introduction

Much has been written on the association between religion and health. The majority of these papers have emphasised both the behavioural correlates of religious affiliation and the health consequences of such behavioural differences. The existence of a series of studies showing a strong association between religion and health raises questions which warrant further research.

Firstly, are the health advantages experienced by those who are more religious a direct consequence of their health related behaviours (e.g. less cigarette use, lower alcohol consumption) or are there less tangible factors (e.g. strong social support networks, the emotional and psychic benefits of a belief in a spiritual being) which contribute to this health advantage?

Secondly, does the changing character of religious commitment and involvement have implications for the association between religion and health? In particular is the decline in mainstream Christian religious activity reflected in the health of those involved?

Thirdly, a concomitant of the decline in the numbers adhering to the traditional Christian denominations is of particular interest; the apparently increasing numbers of persons who join minority sects. The sect members could be expected to manifest the most extreme levels of behaviour change and their health circumstances are therefore of particular interest. Is the health of sect members (and their children) better than that of practising members of the major Christian

churches?

Finally, the majority of previous studies of the health consequences of Christian sect membership have focused upon Seventh Day Adventists and Mormons with few, if any, previous studies of the health consequences of sect membership *per se*. Is sect membership, irrespective of the specific sect involved, an indication of a healthier lifestyle and consequently of a better pregnancy outcome?

In this study we consider the association between particular types of religious affiliation and the out-comes of the pregnancies of a sample of 6566 women in Brisbane, Australia. The research compares members of minority Christian sects with those who are frequent church attenders of the mainstream Christian denominations (Christian attenders) and those who rarely or never attend church but report their affiliation as Christian (lukewarm Christians).

Recent Changes in Patterns of Religious Affiliation

The general decline in Christian church attendance in many European countries [1] and Australia [2] raises the possibility that religion is becoming a less important influence over behaviour, values and beliefs.

British data point to an 8% decline in church membership of the major Christian churches between 1975 and 1985 but a substantial increase in the membership of minority Christian religions (e.g. Mormons, Jehovah's Witnesses) and massive increases in sect type groups during this same period of time [3]. Wilson [1, p. 5] has pointed out that there are now 5000 known small sect type groups and the number is growing.

Australian data confirm the decline in mainstream Christian church affiliation and participation in 1960s and 1970s and the increased role of such groups as Christian charismatic sects [2, pp. 229-293]. Curiously, part of the decline in church attendance in Australia is attributable to a concurrent temporal trend, the increased participation of women in the workforce and their consequent reduced religious involvement [4]. One likely explanation of the decline in religious participation by women is that as increased numbers of women enter the workforce they find, within the work situation, a substitute for the satisfactions which they previously derived from religious activity.

Despite this decline in mainstream Christian church membership and participation, there remain grounds for the view that religion is an influential force in determining behaviour in society. Thus the majority of Australians report they are religious (58%) and they overwhelmingly (80%) report a belief in God. Religious affiliation has been associated with political preferences, a willingness to engage in political action, tolerance of various deviants, sexist attitudes and sexual morality [5].

In sum, the trends in religious practice appear clear. The major Christian churches are experiencing reduced attendances, while some minority religious groups, especially those which demand extensive involvement and participation, are growing. Despite these general trends the majority of Australians profess a belief in God and appear to manifest some religious commitment.

Religion and Behaviour in Contemporary Society

In considering the impact of religious beliefs and practices upon behaviour, it is pertinent to distinguish the dominant Christian religious groups (Catholics, Protestants) from the growing number of minority religions and sect groups.

The Australian Values Study Survey (AVSS) compared the values and

behaviours of 1228 randomly selected Australians. Once the data were adjusted for age differences, the associations between religiosity and a wide range of variables were either weak but significantly different or not significantly different. The major differences which remained of interest were in personal morality [6]. Thus it appears that for the majority of Australians their values, beliefs and behaviour are now only weakly related, if at all, to their religious affiliation and practices.

By contrast members of minority sect groups appear to 'live' their religion. These members often present themselves in a manner which is physically distinctive; they frequently restrict their social and recreational (as well as procreational) activities to their fellow sect members and they subscribe to views which attract an often negative response from others in society. They are overtly ethnocentric in their interactions.

Membership of the Jehovah's Witness sect requires a public demonstration that 10 hr a month or more is spent in house-to-house proselytising [7]; while other sects require their members to avoid idle thoughts and conversations and not to interact un-necessarily with non-sect members [8].

Sect membership appears to be associated with dramatic behavioural differences, but it does not follow that variations in the frequency of church attendance by members of the major Christian religions, are associated with distinguishable health related behaviours.

Religion and Health - The Dominant Religions

The dominant Protestant and Catholic religions place an emphasis on behaviours which would presumably have a variety of health benefits. Thus temperance, sexual fidelity, industry and moderation in all things should guide Christian behaviour. In addition, it could be argued that the truly devout believers benefit from a sense of certainty, an ability to accept and deal with the tensions and stresses of life.

In general studies confirm that devout Christians manifest a healthy lifestyle and better health. Thus religious Protestant students appear to drink less alcohol [9], and more religious youth appear less likely to use 'soft' drugs, alcohol, to smoke cigarettes and to have pre-marital sexual intercourse [10]. Australian studies tend to confirm these findings, while other results suggest that the more religious lead, or at least claim to lead, a more abstemious lifestyle [5, p. 1].

It is consequently not surprising that the health of the more religious appears to be better. Thus the Evans County Cardiovascular Study found that frequency of church attendance was associated with lower blood pressure levels [11], an observation confirmed by a subsequent study of blood pressure variations in religious and non-religious immigrants to the U.S.A. [12]. Other studies have found that the more religious have fewer physical, mental and social symptoms [13] and have lower age, sex and race adjusted death rates from heart disease, pulmonary emphysema, suicide and liver cirrhosis [14], although it may be that this latter result is an artefact reflecting the inability of those already ill to go to church [15].

Previous studies imply that higher levels of religious participation are associated with a more healthy lifestyle which, in turn, is associated with better health, although there remains some uncertainty about the extent and magnitude of better health enjoyed by the more devout.

Religion and Health - The Sects

The decline in membership of the dominant Christian denominations may reflect,

on the one hand, disaffection with traditional and ritualistic modes of worship and, on the other, a desire for a more active, participatory and understandable style of worship.

The outstanding and distinguishing characteristics of sect worship are the requirement for frequent involvement and participation, often encompassing most if not all aspects of daily life. Thus Jehovah's Witnesses restrict their use of alcohol [7, pp. 91-92]. Christadelphians subscribe to the absolute authority of the Bible. They disapprove of alcohol use and may choose to be conscientious objectors [7, pp. 50-53]. The Pentecostal, Charismatic Christian and Assembly of God are Christian revival groups which place an emphasis upon the personal experience of the spirit of God. They subscribe to the cure of illness by the laying on of hands, and emphasise an ascetic lifestyle which restricts the use of cigarettes, alcohol and even the wearing of cosmetics [7, pp. 111-117; 16]. Two other sects which have been the subject of considerable previous health related research are the Seventh Day Adventists (SDAs) and the members of the Church of Jesus Christ of the Latter Day Saints (Mormons).

SDAs are required to abstain from smoking, drinking alcohol, the use of stimulants like tea and coffee, the eating of pork and hot/spicy foods. They are encouraged to follow a vegetarian diet, to have regular exercise, to rest one day in seven and they are required to follow conservative sexual practices [17, 18]. Presumably like the followers of other sects, SDA members do not always follow the demands of their faith and certainly some (perhaps most) who claim to be members break some of its principles [19, 20].

Despite the failure of members to adhere totally to the tenets of their religion, numerous studies now unequivocally demonstrate the reduced morbidity and mortality and the longer life expectancy of SDAs. SDAs have a low incidence of hypertension [21], lower cholesterol levels, less evidence of respiratory and emotional/psychological problems [22] and much lower death rates from all the major causes of death [19, pp. 1016-1028; 20, pp. 296-314; 23]. Interestingly the risk of lung cancer among non-smoking SDAs is half that among demographically similar non-smoking non-SDAs, suggesting that SDAs benefit not only by not smoking themselves but also by having social networks which do not expose them to passive smoking [20, p. 307].

Mormons in many respects, live a similar lifestyle to SDAs and manifest many of the same benefits with just a few exceptions. Mormons proscribe the use of alcohol, tea, tobacco, and coffee; they encourage a strict moral/sexual code, strong family ties and high levels of education [24-26]. Mormons are however permitted to consume meat (though they limit this intake) and like SDAs, only about half adhere to the demands of their religion [25, pp. 37-38; 27]. Mormons appear to have a somewhat higher incidence of hypertension than SDAs, perhaps as a consequence of the inclusion of meat in their diet [28].

The health benefits of the Mormon lifestyle are outstanding. Mormons have overall adult mortality rates about 75% those of a comparably aged U.S. population and at 35 years, an 8 year longer life expectancy [26, pp. 69-74]. Utah, in which 73% of residents are Mormon, has the highest birthrate in the U.S.A. and the lowest infant mortality rate [29].

In sum, sect membership is likely to confer a number of health benefits although data demonstrating this are only available for SDAs and Mormons and are generally restricted to adult morbidity and mortality. It is also not clear whether the health benefits associated with sect membership are directly attributable to a small number of specific lifestyle differences (e.g. smoking, alcohol, vegetarian diet) or whether there are health benefits which are a function of less tangible aspects of group affiliation (e.g. strong social ties, family support and a religious

commitment). response rates and research items are elsewhere [30] and are only briefly described here.

Beginning on 5 January 1981, data were collected for 8556 consecutive patients presenting for their first antenatal clinic visit at one of two major obstetric hospitals in Brisbane. All the respondents are public patients and the sample underrepresents upper class, more educated, higher family income women, but does not appear biased in other important respects.

Women were asked to complete a questionnaire at their first clinic visit (phase A), another one three to four days after the birth (phase B) and another six months later (phase C). The medical details of the pregnancy were abstracted from the hospital record and included in the data set. Response rates at each of the phases were 99% (phase A), 87% (phase B) and 81% (phase C). The medical records for all mothers who gave birth were available. Details of variations in response rates by demographic back-ground have shown that younger women, unmarried women, and women from lower income families have a higher loss to follow-up. All analyses of pregnancy outcomes are consequently adjusted for these variables.

In a previous paper a comparison of some sect groups in our sample indicated they had similar pregnancy outcomes [31]. Consequently for the purposes of this analysis the sub-sample of Christians was divided into three groups. Group one comprised those members of the following sects who reported attending church weekly or monthly (in parentheses number classified as sect members over total number reporting this as current religion).

- (i) Assembly of God (77/86);
- (ii) Brethren (18/22);
- (iii) Christadelphian (10/11);
- (iv) Christian Charismatic (13/15);
- (v) Church of Nazarene (6/9);
- (vi) Jehovah's Witnesses (67/75);
- (vii) Mormon (59/90);
- (viii) Pentecostal (55/64);
- (ix) Christian Revival (2/2);
- (x) Seventh Day Adventist (29/42);
- (xi) Reform Church of Australia (5/5);
- (xii) Ananda Marga (2/2);
- (xiii) World Church of God (6/6).

Group two (see Table 1) comprised all members of the Catholic and Protestant churches who reported attending church weekly or monthly. Group three was similar in reported current religion to group two but it only included those members who stated they attended church less than monthly. These three groups were respectively labelled (mostly) Christian sect members, Christian attenders and lukewarm Christians. Those women who professed no religion ($n = 1171$), who stated they were non-Christian ($n = 112$), 'other' ($n = 104$), or who belonged to a sect but attended infrequently ($n = 80$), were excluded from the analysis. A further 523 women either did not answer the questions concerning their religion or provided insufficient information. Two main comparisons are of interest. Firstly, do sect members (as defined above) differ from Christian attenders in their lifestyles, health and the outcomes of their pregnancies? Secondly, do Christian attenders differ from lukewarm Christians on the same variables?

Table 1. Religious affiliation of sample

	<i>n</i>	%
Christian sect	349	5.3
Christian attender	1063	16.2
Christian lukewarm	5154	78.5
	6566	100

Table 2. Socio-demographic characteristics of mother and her religious affiliation

	Christian sect	Christian attender	Lukewarm Christian	Significance* (P value)
Percent family income below \$5200 per year	4	7	8	P = 0.002
Percent education incomplete junior high school	13	18	20	P < 0.001
Percent lowest occupational status	12	13	19	P < 0.001
Percent aged 18 years or less	3	5	9	P < 0.001
Percent never married	4	11	26	P < 0.001
Percent five or more previous pregnancies	4	3	1	P < 0.001

*Cochran-Mantel-Haenszel test of general association [32].

Results

Table 2 provides details of the association between religious affiliation and the socio-demographic characteristics of respondents. There are important demographic differences between the three groups with sect members reporting higher incomes, higher education and occupational status levels. As well, sect members appear to be somewhat older, more often married and to have had more previous pregnancies. On these demographic variables Christian attenders appear to fall between the sect members and the lukewarm Christians.

Table 3 suggests there are major lifestyle differences between women members of the three religious groups. Sect members eat breakfast more frequently, few report smoking in the week of their first clinic visit, the vast majority claim to have abstained from alcohol since becoming pregnant and they report lower rates of coffee and tea consumption. Sect members have larger social networks but they appear, more frequently, to report an un-planned pregnancy. On each of these variables lukewarm Christians appear to lead a less healthy lifestyle while the lifestyle of the Christian attenders appears to be located between that of lukewarm Christians and sect members. These differences remain significant after adjustment for the mother's sociodemographic characteristics.

Table 4 examines the gestation at delivery, of the three groups. Analysis of variance is used to determine whether the three religious groups vary, and is followed by pairwise comparisons of the groups. Table 4 also illustrates the effect of progressive adjustment for socio-demographic and lifestyle factors. Sect mothers, on average, have slightly longer gestations at delivery, but Christian attenders and lukewarm Christians do not differ in this. Adjustment for socio-demographic variables leaves the original association substantially intact but additional adjustment for the mother's cigarette and alcohol use early in pregnancy reduces the association to one of marginal significance.

In a similar fashion, Table 5 compares the three groups on both the birthweight

of the baby, and the baby's percentile score of weight for gestational age. The weight for age percentile was calculated from the total sample of 6566 pregnancies, excluding those of gestation less than 30 weeks. For each gestation (in weeks) babies were ranked according to birthweight and each was allocated a score between 0 (bottom 1% of weight for gestation) and 99 (top 1% of weight for gestation), inclusive, corresponding to the percentile occupied. Both weight variables show similar results. Sect mothers have the heaviest babies (about 150 g heavier than the babies of lukewarm Christian mothers), while mothers who attended church frequently have babies whose birthweight is similar to those of sect mothers. Adjustment for the mothers socio-demographic characteristics leaves this finding unaltered but interestingly, further adjustment for cigarette and alcohol use early in pregnancy eliminates the association. Similarly, the birthweight for gestational mean age percentile scores of the three groups are indistinguishable once the means are adjusted for lifestyle variables. Further comparisons (not presented) examining perinatal mortality rates, disability rates and admission to the intensive care unit failed to identify differences between the three groups, though the small numbers in each group suggests that such a comparison is not a sensitive test of the health differences of the children of mothers of the three comparison groups.

Table 3. Religious affiliation of mother and her lifestyle at first clinic visit

	Christian sect	Christian attender	Lukewarm Christian	Sig.*	Sig. adj.+
Percent eating breakfast almost every day	76	71	56	P < 0.001	P < 0.001
Percent nil cigarettes in last week	94	78	54	P < 0.001	P < 0.001
Percent no alcohol since pregnant	72	59	48	P < 0.001	P < 0.001
Percent no coffee since pregnant	51	38	36	P < 0.001	P < 0.001
Percent no tea since pregnant	36	26	25	P < 0.001	P < 0.001
Percent no marihuana in last month	97	98	95	P < 0.001	P = 0.05
Percent with planned/possibly planned pregnancy	75	80	80	P = 0.07	P = 0.002
Percent stating large number in social network	50	38	33	P < 0.001	P < 0.001

*Cochran-Mantel-Haenszel (CMH) test of general association [32, p. 420].

+CMH, adjusted for mother's age, previous pregnancies, marital status and income.

Table 4. Gestation at delivery by mother's religious affiliation*

	Gestation in delivery (in weeks)		
	Unadjusted mean	Adjusted mean+	Adjusted mean++
1. Christian sect	39.6	39.6	39.5
2. Christian attender	39.3	39.3	39.3
3. Christian lukewarm	39.3	39.2	39.3
Significance	P = 0.01	P = 0.02	P = 0.06
All paired comparisons	1 vs 2	P < 0.01	P = 0.04
	1 vs 3	P < 0.01	P = 0.02
	2 vs 3	P = 0.98	P = 0.91

*GLM program [32, pp. 433-506].

+Adjusted for the following socio-demographic variables; mother's age, previous pregnancies, marital status and income.

++Adjusted for the above socio-demographic variables and the following lifestyle variables; cigarette and alcohol use.

Discussion

In the context of an apparent decline in the importance of the traditional Christian churches, this study has compared the pregnancy outcomes of women sect members, Christian church attenders and lukewarm Christians.

The data point to the better pregnancy outcomes of sect mothers (longer gestations at delivery, heavier babies at delivery), and the poorer pregnancy outcomes of lukewarm Christian mothers. In most instances, children of Christian attenders were more like children of Christian sect mothers than children of lukewarm Christians.

The findings also point to the healthier lifestyle of the sect mothers, and the intermediate position (on the lifestyle variables) of the Christian attender mothers.

Could these findings be artefactual, a consequence perhaps of some as yet unconsidered factor? It might be suggested that mothers who report sect membership are healthier than other Christian mothers, prior to joining their sect. The factors which persuade some persons to join a minority sect are not well understood. One study of such sect joiners suggests that their health related behaviour improves following membership [33]. There appears little reason to believe that sect joiners are a particularly healthy group, and the argument that sect membership improves health related behaviours, and health, is more consistent with the available evidence.

Alternatively, it might be suggested that unhealthy sect mothers do not attend church, thus producing a bias in favour of sect attending mothers. This possibility would be more tenable were the sample not comprised of young, generally healthy women.

Table 5. Birthweight and birthweight adjusted for gestation by mother's religious affiliation

		Birthweight (g)		
		Unadjusted mean	Adjusted mean*	Adjusted mean+
1.	Christian sect	3490	3439	3416
2.	Christian attender	3436	3393	3390
3.	Christian lukewarm	3340	3327	3362
	Significance	P < 0.001	P < 0.001	P = 0.14
All paired comparisons	1 vs 2	P = 0.14	P = 0.22	P = 0.48
	1 vs 3	P < 0.001	P < 0.001	P = 0.10
	2 vs 3	P < 0.001	P < 0.01	P = 0.17
		Percentile of birthweight for gestation		
		Unadjusted mean	Adjusted mean*	Adjusted mean+
1.	Christian sect	55.2	52.7	51.6
2.	Christian attender	54.1	52.0	51.9
3.	Christian lukewarm	48.5	48.0	49.9
	Significance	P < 0.001	P < 0.001	P = 0.14
All paired comparisons	1 vs 2	P = 0.55	P = 0.70	P = 0.87
	1 vs 3	P < 0.001	P < 0.01	P = 0.33
	2 vs 3	P < 0.001	P < 0.001	P = 0.06

*Adjusted for the following socio-demographic variables; mother's age, previous pregnancies, marital status and income.

+Adjusted for the above socio-demographic and the following lifestyle variables, cigarette and alcohol use.

Further, it is pertinent to note that this study compares relatively large samples and therefore differences of even modest magnitude are significant, though as we

have observed some of the observed differences are both statistically significant and substantial in magnitude.

Once the outcomes are adjusted for lifestyle differences between the sect groups (in addition to the earlier adjustment for socio-demographic differences), the three religious groups no longer differ in the outcomes of their pregnancies, further pointing to the health benefits of the lifestyle of sect members.

The findings suggest that there is a continuing impact of religious beliefs and practices on health related behaviours and the consequent health of pregnant women. In particular sect mothers appear to live a very healthy lifestyle ingesting fewer harmful substances and they appear to have larger and more supportive social networks.

On most of these lifestyle variables Christian attenders also appear to behave in a more healthy manner when compared to lukewarm Christians, but not as healthy a manner as sect mothers.

The finding that the three religious groups have similar pregnancy outcomes, once the data are adjusted for lifestyle differences between them, warrants special comment.

One interpretation of this finding is that the life-style differences used in the statistical adjustment explain the birthweight variations between the religious groups (i.e. smoking and alcohol consumption). From this interpretation it would follow that if all women could be persuaded to smoke and to drink alcohol as infrequently as do sect mothers, then the mean birthweight of their babies would be greater.

Another interpretation of the finding would question this latter conclusion. Thus it could be argued that sect women (and to a lesser extent Christian attenders) differ from other women professing Christianity not simply in their use of cigarettes and alcohol, but in a wide range of behaviours, only a few of which we identify in this paper. By statistically adjusting for cigarette and alcohol use, it is possible that, because the variables are block-booked (they go together), other factors are being implicitly controlled as well. It might be the case that the birthweight differences are, in practice, attributable to behaviours which are closely linked to cigarette and/or alcohol use, but are not a consequence of such use.

There is however, a more plausible third possibility which warrants consideration. While it is unreasonable to suggest that variables are block-booked, it does not follow that such an observation denies the direct causal impact of the mothers' substance use on the birthweight of baby. Sect mothers may behave quite differently, in many respects, to mothers categorised as lukewarm Christians, but the babies' birth-weight may still be most directly influenced by whether the mother smokes cigarettes. This suggestion is supported by an inspection of Table 5 which shows that sect mothers and Christian lukewarm mothers have babies whose birthweight (adjusted for socio-demographic variables) differs by about 100 g, an amount plausibly due to smoking.

However, the very observation of a complex of behavioural differences, while it does not deny the causal validity of a single factor, has substantial implications for possible health promotion efforts.

Sect mothers limit their use of harmful substances, it could be argued, because their health related behaviour is predicated upon a strongly held set of moral values and precepts. It follows from this interpretation that efforts to dissuade women from smoking may be relatively unsuccessful in the absence of similarly and broadly held sets of values and beliefs. Substance use (and abuse) are not

likely to be individual behaviours which may be modified in isolation from the other aspects of a persons' lifestyle. Rather the findings of this study direct attention to the whole of an individual's lifestyle and the likely need to address this on a broad front. This is not to deny that mass media methods, individual counselling and taxation increases may all lead to reductions in cigarette and alcohol use, but rather to note that these latter approaches produce modest declines compared to the wide variations in cigarette and alcohol use observed in this study.

Conclusion

Generally the data confirm the existence of an important association between the religious beliefs and related practices of pregnant women and the outcomes of their pregnancies. Higher levels of religious commitment appear to be associated with more favourable pregnancy outcomes, with mothers who profess sect affiliations having the best pregnancy outcomes.

While it appears that the better health of the more religiously active is a consequence of their more abstemious lifestyle, it would be simplistic to suggest that lifestyle is independent of the underlying moral preferences, values and beliefs. In a practical sense it is likely to be difficult to encourage pregnant women to modify their behavioural patterns without also addressing their fundamentally held values and beliefs.

The findings suggest three conclusions. Firstly, despite a change in the nature of religious practice, religious beliefs continue to influence health related behaviours and health. Secondly, the healthiest group appears to be those women who belong to minority Christian religious sects. Thirdly, underlying the health related behaviours of Christian sect members are likely to be a constellation of interrelated values. This points to the need for those seeking to modify the health of others to consider the structural circumstances of those whose behaviour they wish to change in addition to addressing specific beliefs and behaviours.

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