Religiosity, Anxiety and Pregnancy Outcomes in Indian Women

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The aim of the present study was to examine the relationships between religiosity, anxiety and pregnancy outcomes. It was hypothesised that (i) religiosity would be negatively related to anxiety, (ii) religiosity would be positively related to healthy pregnancy outcomes and (iii) anxiety would be negatively related to healthy pregnancy outcomes. The study was conducted on a sample of 200 pregnant women (aged 20-30 years) in the third trimester of their pregnancy, which were recruited in the Obstetrics department of the Institute of Medical Sciences, Banaras Hindu University, Varanasi. The assessment of gestational age was based on the last menstrual period. Religiosity and anxiety were assessed using Bhusan's Religiosity Scale, Rastogi and Tripathi's State and Trait and Free Floating Anxiety Scale (Hindi version) respectively. The personal data sheet was also used for obtaining information regarding the delivery and health status of the baby from hospital records. The data was analysed with correlation and hierarchical regression. Results indicated that religiosity is significantly negatively correlated with anxiety and positively correlated with pregnancy outcomes, indicating that more-religious women would experience less anxiety and would have healthy pregnancy outcomes. Results also revealed that anxiety is negatively related to healthy pregnancy outcomes.

Keywords: Religiosity, anxiety, gestational age, infant weight, Apgar score

Religion is a universal and widespread phenomenon, as it is the core of various cultures, and influences people of all ages, socio-economic status and educational levels. Every aspect of life, especially in the East, is more or less filled with religious sentiments or qualities and perceived as part of religious life. The personal, domestic and social lives of the people are largely influenced by the philosophy of their own religion (Shukla, 1990). Religion is a very significant social force in shaping human behaviour. It is closely related to the development and change of attitudes and beliefs, the arousal and reduction of anxiety and guilt and the determination of cognitive and motivational processes (Verma & Upadhyaya, 1984).

Religion is an important dimension of people's lives around the world. It has been reported that 98% of the population in India, 88% in Italy, 72% in France and 63% in Scandinavia say that they believe in God (Gallup, 1985). Of the world's 6 billion people, approximately two-thirds are either involved in religion or have been affected by religion in important ways (Paloutzian & Santrock, 2002). Females have shown a consistently stronger interest in religion than males have (Bijure Wallston, Smith, Lifrak & Friedman, 1993; Francis & Wilcox, 1998; Miller & Hoffman, 1995). They participate more in both organised and personal forms of religion, are more likely to believe in a higher power or presence and feel, more than men do, that religion is a very important dimension of their lives (Krejci, 1998).

Religion may be hypothesised to have an important influence on human health and behaviour. From the beginning of time, the mutual influence of religion and health has been recognised in various cultures of the world. Religious resources figure predominantly among the methods that are called on when coping with life stress and illness (Cole & Pargament, 1999; Dein & Stygal, 1997; Koenig, 1997; Pargament, 1997).

Numerous epidemiological studies have demonstrated religiosity to be positively associated with indicators of good mental health and negatively associated with symptoms of

mental illness. However, research regarding religiosity and pregnancy outcomes is the area that is still neglected. Although some research have been conducted on this important area, they are very limited. Pregnancy is portrayed as a joyous time. However, for some women, it may be a time of emotional disturbance. Religiosity may act as a coping mechanism in dealing with the ups and downs of pregnancy.

Depressive, anxiety and stress symptoms are quite prevalent during pregnancy (Beck, 2001; Copper, Murray, Hooper, West, 1996; Hertzberg, Wahlbeck, 1999). The influence of anxiety, depression and stress in pregnancy on a variety of perinatal outcomes has been widely investigated and this literature has been reviewed by several authors (Ascber, 1978).

The association of anxiety during pregnancy with adverse birth outcomes has been examined in a few studies, some of which focused an association (Brook, Anderson, & Bland, 1989) while some others did not (Peacock, Bland, Anderson, 1995; Wadhwa, Sanderman, Porto, 1993). High levels of anxiety make it difficult for women receiving fertility treatment to conceive (Sanders & Bruce, 1999). Anxiety in the expectant mother has been linked to an increased of foetal heart rate (Monk, Fifer, Myers, Sloan, Trien & Hurtado, 2000), premature births (Mackey, Williams, & Tiller, 2000), low weight at birth, foetal distress (Bhagwanani, Seagraves, Dierker & Lax, 1997), certain behavioural characteristics of the newborn baby (Oyemade et al. 1994) and congenital neonatal anomalies (Bhagwanavi et al. 1997). A recent meta-analysis reported that there was not a significant association between anxiety symptoms and overall perinatal outcomes, though small, statistically significant relationships were present for birth weight and a 5-minute Apgar score (Littleton, Breitkopf & Berenson, 2007).

Given the substantial prevalence of anxiety in pregnant women, with the possibility that this factor may negatively impact pregnancy and birth outcomes in Indian women and there is evidence that religion is generally associated with good mental health. In addition, it is a fact that little research has been done on religion and pregnancy outcomes, so research on relationship between religion, anxiety and pregnancy outcomes is warranted.

Objectives:

(i) To examine the relationship between religiosity and anxiety.

(ii) To study the relationship between religiosity and pregnancy outcomes (birth weight, gestational age and apgar score of 1 and 5 minutes.

(iii) To evaluate the relationship between anxiety and pregnancy outcomes.

Hypotheses:

(i) Religiosity would be negatively related to anxiety.

(ii) Religiosity would be positively related to healthy pregnancy outcomes (gestational age, infant weight and apgar score of 1 & 5 minutes).

(iii) Anxiety would be negatively related to healthy pregnancy outcomes (gestational age, infant weight and apgar score of 1 & 5 minutes).

Method

Sample:

Recruitment of pregnant women was co-ordinated informed consent by the Department of Obstetrics and Gynaecology, Sir Sunder Lal Hospital, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India. The sample of the study was consisted of 200 (Hindu) pregnant women aged (20-30 years) in the third trimester of their pregnancy.

Inclusion criteria: Age between 20 and 35 years, ability to read and write Hindi, in the third trimester of their pregnancy and absence of psychological or psychiatric disease necessitating hospitalisation.

Exclusion criteria: Unmarried mothers, HIV positive mothers and women with chronic infectious diseases. Those with cardiopathy, mental diseases, hypertension/preeclampsia/eclampsia, vaginal bleeding and multiple deliveries were not included in the study.

Measures:

The Religiosity scale developed by Bhusan (1974) was used to ascertain the degrees to which

women describe themselves as religious. It consists of 36 items, out of which 25 are positive and 11 are negative. The items are rated on the five-point Likert type scale ranging from 1 (Totally agree) to 5 (Totally disagree). The religiosity scale posses fairly high reliability, the spearman-brown formula gave a reliability co-efficient of .82 (Bhusan, 1971) and Cronbach alpha gave a reliability co-effiecient of (.89) (Kumari, Joshi & Jain, 2009). The subject's religiosity score is the algebraic sum of scores obtained on all the different items. As the number of items in the scale is 36, the range of possible scores on it is from 36 to 180. Higher scores obtained by subjects indicates a greater degree of religiosity.

Anxiety: It was measured by using the full version of the state and trait anxiety scale of state, trait and free-floating anxiety scale (Hindi version) of Rastogi and Tripathi (1986) in the third trimester of pregnancy. The indices of internal consistency for both the state and trait scale is .93 and .89 respectively.

Measures of Pregnancy Outcomes: The present study includes three pregnancy outcomes, i.e. gestational age, infant weight and apgar score of 1 and 5 minutes. All the three outcomes were treated as continuous variables.

i) Gestational age was measured in weeks at delivery using the "37 weeks" clinical criterion.

ii) Infant weight was measured in grams, using the "2500 grams" clinical criterion.

iii) Apgar score was determined by evaluating the newborn baby on 5 simple criteria, on a scale from 0 to 10. The five criteria included Appearance, Pulse, Grimace, Activity and Respiration. Scores ≤ 3 are generally regarded as critically low, 4 to 6 as fairly low and 7 to 10 as generally normal.

Procedure:

Participants from the outpatient department (OPD) who were in the third trimester of their pregnancy were explained the details of the study and their informed consent was obtained. At this stage, the demographic data, medical, obstetrical and gynaecological history was thoroughly documented and the booklet containing the questionnaires was handed over to complete in the clinic. Gestational age was determined by the last normal menstrual period.

Results

It was found that the mean score of religiosity was 140.24 (SD. 11.43), the mean score of state anxiety was 40.50 (SD. 5.07) and the mean score of trait anxiety was 42.27 (SD. 5.05). The scores obtained by the religiosity scale was divided into two groups, first as the high level of religiosity group and second as the low level of religiosity group through a median, to observe which level of group has more anxiety and healthy pregnancy outcomes. This is presented in Table 1. The total number of subjects in the high religiosity group and the low level of religiosity is 110 and 90 respectively. Through descriptive statistics means, S.D. and t-value were calculated. It was found that the mean scores of anxiety were less in the high religiosity group. The high religiosity group has a mean of 38.12 (SD. 2.4), whereas the low religiosity group has a mean of 43.41 (SD. 5.88) for state anxiety .Similarly, the mean of trait anxiety is 40.02 in the high religiosity group and 45.01 in the low religiosity group. The t-value of the mean scores of state anxiety is 8.54 and The t-value of the mean scores of trait anxiety is 7.94, which is significant at the 0.01 level. Thus, it indicates that the women who are more religious are less anxious in the third trimester of their pregnancy.

Table 1. Significance of the difference between the mean scores of state anxiety and trait anxiety during the 3rd trimester of pregnancy in the high religiosity group and the low religiosity group

	High Religiosity Group (N= 110)		Low Religiosity Group (N=90)		t-ratio
	Mean	S. D.	Mean	S. D.	
State anxiety in 3rd trimester	38.12	2.46	43.41	5.88	8.54**
Trait anxiety in 3rd trimester	40.02	2.98	45.01	5.69	7.94**

**p<.01

Table 2. Significance of the difference between the mean scores of gestational age, infant weight and apgar score of 1 and 5 minutes in the high religiosity group and the low religiosity group

High Religiosity	Group (N= 110)		Low Religiosity Group (N=90)		t-ratio
	Mean	**SD**	**Mean**	**SD**	
Gestational age	37.72	.70	36.81	.92	7.75**
Infant weight	2.99	.32	2.54	.32	9.56**
Apgar score of 1 minute	7.46	.65	5.92	1.61	8.48**
Apgar score of 5 minute	8.53	.58	7.08	1.61	8.06**

**p<0.01

Similarly, the result displayed in Table 2 also shows that the total number of subjects in the high religiosity group is 110 and the total number of subjects in the low religiosity group is 90. It shows that t-ratios were significant in case of the high religiosity group and the low religiosity group on all the pregnancy outcomes viz., gestational age, infant weight and apgar score of 1 & 5 minute**s.** It is visible from Table 2 that highly religious women were delivering at $\geq$ 37 weeks **(**t= 7.75. p<0.01), higher infant weight (t=9.56,

p<0.01) and good apgar score at 1 minute (t= 8.48, p<0.01) and 5 minutes (t= 8.06, p<0.01), revealing that women with high religiosity were more likely to deliver at $\geq$ 37 weeks, infant birth weight $\geq$ 2500 grams and normal apgar score of 1 & 5 minutes.

The Pearson correlation coefficient was used to study the relationship between religiosity, anxiety and pregnancy outcomes, which is shown in Table 3.

Table 3. Correlational analysis between religiosity, anxiety and pregnancy outcomes (gestational age, infant weight and apgar score) during the third trimester of pregnancy

	State Anxiety	Trait Anxiety	Gestational Age	Infant Weight	Apgar . Score 1 min	Apgar Score 5 min.
Religiosity	-.763**	-.726**	.692**	.717**	.725**	.706**

** p<0.01

Table 4. Correlations between anxiety and pregnancy outcomes (gestational age, infant weight and apgar score of 1 and 5 minutes)

	Gestation Age	Infant Weight	Apgar Score of 1 Minute	Apgar Score of 5 Minute
State anxiety 3rd trimester	-.648**	-.668**	-.784**	-.780**
Trait anxiety 3rd trimester	-.594**	-.655**	-.703**	-.696**

** p<0.01

This table shows that religiosity is significantly negatively correlated with state anxiety and trait anxiety (p<0.01), whereas it has significant positive correlation with gestational age (p<0.01), infant weight (p<0.01), apgar score of 1 minute (p<0.01) and apgar score of 5 minutes (p<0.01). This reveals that women who were more religious were less anxious during the third trimester of their pregnancy and were more likely to have healthy pregnancy outcomes in terms of

gestational age, infant weight and apgar score of 1 and 5 minutes. The correlation analysis in the above table shows that state and trait anxiety in the third trimester are negatively correlated with gestational age (p<0.01), infant weight (p<0.01), apgar score of 1 minute (p<0.01) and apgar score of 5 minutes (p<0.01). This indicates that women who reported higher state and trait anxiety were more likely to deliver an infant of shorter gestational age and more likely to deliver a low birth weight infant.

Discussion

The purpose of this study was to examine the associations between religiosity, anxiety, and pregnancy outcomes. Firstly, our findings indicate that there is a significant inverse relationship between greater religiosity and symptoms of anxiety in pregnant women. This finding supports previous research linking religiosity with better mental health. A very recent study conducted by Mann, McKeown, Bacon, Vesselinov & Bush (2008) examined the relationships between religiosity, spirituality, and anxiety in pregnant women. They found that overall religiosity and spirituality (odd ratio 0.53; p=0.006) were significantly associated with significantly lower odds of a positive anxiety screen.

Similarly, in a one-year follow-up study of 177 older adults in the Netherlands, Braam Beckman, Deeg, Smith and Tillburg (1997) found that people who indicated religion to be one of the three most important things in their lives had significantly less chance of becoming depressed in comparison with those who did not ascribe such importance to religious faith. These finding shows a negative relationship between religion and anxiety, proving our hypothesis that women with high religiosity have less anxiety as compared to women with low religiosity.

Secondly, religiosity is significantly positively associated with gestational age, birth weight and apgar score after delivery. After an exhaustive search for literature related to religiosity/ spirituality and pregnancy, we found that research on these variables remains very limited. A study by Najman, Williams, keeping, Morrison and Anderson, (1988) on the relationship of religiosity with maternal and infant health, revealed that religious sect members (Mormon, Seventh Day Adventist or Jehovah's exhibited significantly fewer health risk behaviours in pregnancy, such as the use of alcohol, drugs or tobacco and other unhealthy lifestyle choices and practices. Their infants weighted significantly more and had a later gestational age at birth than infants of mainstream Catholics and Protestants. Similarly, Magna and Clark (1995), who reviewed the literature on the relationship of religiosity and spirituality with birth outcomes in Mexican American women, found that Mexican American women experience less perinatal mortality and higher birth weights, despite lower socioeconomic status and less prenatal care because of the strong influence of spirituality and religiosity is Latino culture. The findings of the present study is more or less consistent with these findings, which indicates that highly religious women had a full-term delivery ($\geq$ 37 weeks) and their infants weighed more ($\geq$ 2500 gm).

Thirdly, there was significant association between anxiety and pregnancy outcomes. It shows that a higher level of anxiety is associated with poor perinatal outcomes. These findings are consistent with the studies conducted by Mackey, William and Tiller (2000), in which they have demonstrated that higher anxiety is related with premature births. Similarly, Paalberg and Mackey (1999) explored how women reporting a high level of anxiety had a low weight of infant at birth.

According to Simon, Crowther & Higgerson (2007), women with high-risk pregnancies have identified religiosity/spirituality as important aspects of their coping with the stressors. Thus, we may hypothesise that religiosity may reduce anxiety by providing a mechanism for pregnant women to cope with the stress of impending motherhood and for dealing with problems in life, as every religion provides a way to cope with suffering and problems of life. Religiosity may provide women with a belief in a powerful deity who exerts ultimate control over life's uncertainty.(Mann,et.al,2008) It provides a belief system or cognitive framework that enhances adaptive coping, provides a sense of spiritual direction and meaning in life (Moreira-Almeida, Neto & Koenig, 2006), provides hope, gives confidence that one, with the help of God, could influence the health condition; and creates a mindset that enables the person to relax and heal self (Koenig, McCullough & Larson, 2001).

Conclusion

Based on the findings of the present study, this paper confirms that women who were more religious reported less anxiety and had healthy birth outcomes. Their infants were delivered at $\geq$ 37 weeks and weighted $\geq$ 2500 gm. As the

studies examining the relationships between anxiety and religiosity provide mixed results, the findings of this study create some vision in existing literature. Also, there are a few studies on religiosity and pregnancy outcomes .These studies have generally been conducted in foreign countries. Thus, the present work provides very useful information regarding the relationship of religion and pregnancy outcomes. This field is very new and emerging; therefore, future work should be conducted in this field so that the relationship between these variables could be clarified.

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