Prevalence of pregnancy anxiety and associated factors

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\textbf{A R T I C L E  I N F O}

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\textbf{A B S T R A C T}

\textbf{Objective:} To determine the prevalence of pregnancy-specific anxiety (PSA) and its associated factors among pregnant women during the three trimesters of pregnancy.

Design: A prospective explorative survey was conducted among 500 low-risk Indian pregnant women of age 18–35 years.

Setting: A major maternity government hospital in southern state of Kerala, India.

Participants: 500 low risk pregnant women who attended the major maternity government hospital during the period June 2004–July 2005 were selected as convenient sample.

Methods: An exploratory research design with a prospective cohort approach was adopted for the study. State Trait Anxiety Inventory (STAI) and Pregnancy-Specific Anxiety Inventory (PSAI) were used to collect the data.

Results: Highest prevalence of pregnancy-specific anxiety (PSA) was reported during the third trimester of pregnancy. All pregnant women rated high levels of third trimester childbirth anxiety compared to other three components of pregnancy-specific anxiety. Nulliparous pregnant women reported higher levels of PSA than parous pregnant women ($M = 134.40$, $M = 116.8$). Young age, nulliparous status and nuclear family nature were identified as common risk factors of pregnancy-specific anxiety.

Conclusion: During the transition to motherhood, the risk factors and timing of heightened pregnancy-specific anxiety differ. Higher prevalence of pregnancy anxiety among nulliparous and younger pregnant women necessitates an integrated routine screening of PSA during prenatal care. Early detection, prevention and management of pregnancy anxiety will enable women to cope with the challenges of pregnancy.

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\textbf{1. Introduction}

Pregnancy is not only a period of great joy, but also one of great stress to a woman both physically and mentally. Even in healthy women, pregnancy may give rise to many anxieties because of anticipated uncertainty associated with it. Evidences show that pregnancy anxiety not only affects pregnant women’s health but also have an impact on labour outcomes such as preterm delivery, prolonged labour, caesarean birth, low birth weight (Catov, Abatemarco, Markovic, & Roberts, 2010; Hernandez-Martinez, Val, Murphy, Busquets, & Sans, 2011; Lobel et al., 2008; Rauchfuss & Maier, 2011). Findings of Lee et al. (2007) and Teixeira, Figueiredo, Conde, Pacheco, and Costa (2009) revealed a varied prevalence of pregnancy anxiety at different trimesters of pregnancy with high levels in first and third trimesters.

Previous studies on pregnancy anxiety from different part of the world reported a high and diverse prevalence rate of 14–54%. However, most of these studies explored general pregnancy anxiety than pregnancy-specific anxiety (García Rico, Rodríguez, Díez, & Real, 2010; Hernandez-Martinez et al., 2011; Nieminen, Stephansson, & Ryding, 2009; Teixeira et al., 2009).

Pregnancy-specific anxiety is defined as worries, concerns and fears about pregnancy, childbirth, and health of infant and future parenting (Huizink, Mulder, Robles de Medina, Visser, & Buitelaar, 2004). Serçekus and Okumus (2009) reported that nulliparous women’s childbirth fears were related to labour pain, birth-related problems and procedures.

Previous researches on pregnancy anxiety concluded that pregnancy-specific anxieties are the real predictors of adverse labour outcomes than general anxiety. These researchers...
recommended that estimation of pregnancy-specific anxiety benefited in identification and risk reduction more specifically (Bayrampour, Heaman, Duncan, & Tough, 2013; Huizink et al., 2004; Rauchfuss & Maier, 2011; Reck et al., 2013). With limited evidence available on specific fears and worries related to pregnancy, the structure of pregnancy anxiety and its impact on pregnancy outcomes necessitates further studies exploring pregnancy-specific anxieties and its risk factors.

The formal childbirth education classes are not generally available in various hospitals in Kerala, India and even the measures to explore anxiety during pregnancy are buried under heavy patient loads. High prevalence (90–94%) of childbirth anxiety and poor knowledge on preparation for childbirth among nulliparous pregnant women of Kerala were reported by previous studies on nulliparous pregnant women (Lucy Joseph, 2010; Mary, 2006). Proper addressing of pregnancy anxiety becomes difficult due to the non-availability of formal childbirth education classes. The traditional way of transferring knowledge on pregnancy and childbearing from mothers to daughters is vanishing due to the urbanisation and the trend toward nuclear family system. To the best of our knowledge, the pregnancy-specific anxiety has not been investigated well in the current setting.

The significance of estimation of pregnancy-specific anxiety and its associated factors towards pregnancy risk reduction demand for comprehensive research on pregnancy-specific anxiety. This study aimed at determining the levels of pregnancy-specific anxiety and its associated risk factors, which in turn would help in designing and implementing appropriate strategies intended for reductions of adverse pregnancy outcomes. Objectives of the study were to determine the prevalence of pregnancy-specific anxiety during the three trimesters of pregnancy and to identify the associated risk factors.

2. Literature review

Pregnancy anxiety varies from woman to woman. The level of stress in pregnant women experiences affects the outcome of pregnancy. An observational, analytical cross-sectional study among 174 third trimester pregnant women in Spain revealed that pregnant women’s anxiety levels were higher than average levels in the general population (Garcia Rico et al., 2010). High prevalence of antenatal anxiety—both State and Trait anxiety—was reported from 453 pregnant women in Sao Paulo (Faisal-Cury & Rossi Menezes, 2007).

A prospective study among 160 third trimester Iranian pregnant women, showed a significant relationship between general anxiety and fear of childbirth. Nulliparous women reported higher levels of anxiety in 28th and 38th weeks of gestation than parous (Alipour, Lamyian, & Hajizadeh, 2012). Study among 660 low risk third trimester Turkish pregnant women revealed a significant relationship between fear of childbirth and general anxiety and higher scores of fear of childbirth in nulliparous women than parous women (Körükçü, Firat, & Kukulu, 2010). An observational cross-sectional study in Northern Ireland among 263 healthy low-risk mothers found that there was a high degree of pregnancy-related anxiety among nulliparous pregnant women (Lynn, Alderdice, Crealey, & McElhinny, 2011).

A cross-sectional descriptive survey conducted among 650 low risk third trimester pregnant women of 17–46 years of age revealed 25% childbirth fear and the authors concluded that the risk factors and timing of heightened anxiety during the transition to motherhood differ in pregnant women (Hall, Stoll, Hutton, & Brown, 2012). Henderson and Maggie (2013) reported 14% prevalence of antenatal anxiety from 5332 samples of maternity clinic attendance of England. They identified young maternal age as well as ethnicity as risk factors of pregnancy anxiety. A population-based community study among 916 Swedish first trimester women by Rubertsson, Hellstrom, Cross, and Sydsjo (2014) estimated 15.6% prevalence of anxiety symptoms and reported that women under 25 years of age were at an increased risk of anxiety symptoms. They concluded that anxiety symptoms during pregnancy increased the rate of preference for caesarean section. Arch (2013) investigated socio-demographics of pregnant women to find out predictors of pregnancy anxiety in US sample of 311 pregnant women. They concluded that younger age, nulliparous status and high levels of general and state anxiety predicted higher pregnancy-related anxiety.

Many studies reported that the high preference for caesarean section was associated with fear of childbirth. Fenwick, Gamble, Nathan, Bayes, and Hauck (2009) reported that nulliparous women experienced more childbirth fear and the high antenatal fear was associated with emergency caesarean delivery. An Israeli study investigated the psychological traits as well as social and demographic factors associated with caesarean section on maternal demand among 59 healthy primigravid women. The study concluded that fear of childbirth was the only psychological variable associated with the choice for caesarean section. (Handelzalts et al., 2012).

Nieminen et al. (2009) reported that maternal request for caesarean section was out of fear of intense childbirth. In a Danish National Birth Cohort with nulliparous women found that fear of childbirth in early (16 weeks) and late (31 weeks) pregnancy was associated with emergency caesarean section (Laursen, Johansen, & Hedegaard, 2009). Despite the fact that extensive measures are observed to decrease the rate of caesarean sections, the trend of caesarean births is increasing considerably even in many developed countries (Fenwick et al., 2009). One possible contributor to this upward trend of caesarean is the maternal demand due to high childbirth anxiety.

The results from a large multi-ethnic community-based study in Amsterdam involving 7740 pregnant women revealed that pregnancy anxiety was related with adverse labour outcomes such as preterm and low birth weight (Loomans, van Dijk, et al., 2013). Catov et al. (2010) conducted a prospective longitudinal study among 667 African American pregnant women revealed that maternal anxiety was associated with increased risk of preterm birth and low birth weight. Rauchfuss and Maier (2011) concluded from their prospective study among 580 German pregnant women that pregnancy related anxiety was positively linked to preterm delivery. An exploratory study among Spanish 205 pregnant women and reported that maternal anxiety were related to less gestational age at birth, mode of delivery and infant birth weight (Hernandez-Martinez et al., 2011).

Assessment of general anxiety during pregnancy may underestimate pregnancy-specific anxiety. The structure of pregnancy-specific anxiety was explored among 230 normal risk nulliparous pregnant women using a 34-item pregnancy-related anxiety questionnaire. They reported marked increase in pregnancy-specific anxiety and suggested measurement of pregnancy-specific anxiety to address issues of prediction, identification and risk reduction more precisely and effectively (Huizink et al., 2004). German sample of 88 women was examined to determine whether anxiety symptoms during pregnancy had an impact on the duration and method of childbirth using and STAI and pregnancy-specific anxiety questionnaire. They reported that childbirth-specific anxiety assessed by the revised pregnancy-specific anxiety questionnaire was an important predictor of total birth duration whereas, general anxiety measured by the STAI had no effect (Reck et al., 2013). Bayrampour et al. (2013) concluded that pregnancy related anxiety as risk predictor of pregnancy risk among nulliparous women. Even though the exploration of pregnancy-specific anxiety...
and its associated risk factors would help to develop and implement specific interventions which would eventually reduce the adverse labour outcomes, only few studies are confined to measurement of pregnancy-specific anxiety. The present study determined the prevalence of pregnancy-specific anxiety levels during the three trimesters of pregnancy and its associated risk factors in Kerala, India.

3. Methods

An exploratory research design with a prospective cohort approach was adopted for the study. All pregnant women attending antenatal clinic of the setting were considered as population. Pregnant women who met the inclusion criteria and volunteered to participate in the study were recruited to the study as convenient samples. The study was conducted among 500 low risk pregnant women attending one of the major government hospitals in southern state of Kerala, India during the period from June 2004–July 2005. Only willing women in the age group of 18–35 years with low risk pregnancy and singleton foetus expecting normal delivery were selected for the study provided they were educated, having sound mental and physical health. All pregnant women with moderate and high risk pregnancy were excluded.

3.1. Description of the tools and reliability

General anxiety was measured by a standardised tool State Trait Anxiety Inventory (STAI) (Spielberger, 1989), a self-report 40 item Likert scale with total score of 160 and is widely used in pregnancy (Faisal-Cury & Rossi Menezes, 2007). Both state and trait anxiety were measured and analysed separately. Internal consistency ranges from 0.86 to 0.85 for state and 0.89 to 0.91 for trait subscale. Cronbach’s alpha was 0.88 for state and 0.83 for trait anxieties, reflecting the tool reliability.

Pregnancy-specific anxiety was assessed by a standardised structured Pregnancy-Specific Anxiety Inventory (PSAI), 40 items self-report questionnaire on a five-point Likert scale with a maximum score of 200. It measured the intensity of woman’s pregnancy anxiety related to four areas of pregnancy and childbirth. Anxiety about Being Pregnant (ABP) with 16 items; Anxiety of Childbirth (ACB) with 10 items; Anxiety about Breastfeeding (ABF) with eight items and Anxiety about New born Care (ANB) with questions items were parts of the PSAI. The face and content validity of the PSAI were established by expert review and pilot study. The reliability coefficient of 0.76 assured the reliability of PSAI.

Socio-personal and obstetric variables were collected during the initial interview. The items included were pregnant women’s age, obstetric scores such as gravidity; history of abortions; stillbirth; the weeks of gestation; education and occupation of the pregnant woman and husband; the type of family; support systems; family history of mental illness; sources of information for pregnant women and husband’s habit of smoking, drinking and alcoholism. In addition, the satisfaction and quality of marital life and relationship with in-laws were also explored on a five-point rating scale.

3.2. Ethical consideration

The study was conducted after the approval of Ethical Advisory Committee of the Schools of Behavioural Sciences under Mahatma Gandhi University. Permission for data collection was obtained from the District Medical Officer. An informed written signed consent was obtained from each participant, which emphasised voluntary nature, anonymity and the right to withdraw from the study at any point without affecting their routine care. The data were kept locked and confidential.

3.3. Data collection procedure

The pregnant women who met the inclusion criteria were recruited to the study during their first trimester period. An average antenatal attendance of 60–75 pregnant women per day assured feasibility for adequate sampling from June 2004–July 2005. A convenient sampling method was used depending upon eligibility and voluntary willingness from those who attended antenatal clinic. Each informed and signed first trimester pregnant woman was contacted by the researcher and interviewed for socio-personal variables in a convenient room next to antenatal clinic. Then they were asked to self-rate their anxiety level using STAI and PSAI. Participants were asked to read through each statement in the PSAI and STAI carefully and then mark their perceived levels of anxiety on a 1–5 rating scale against each statement. Each rating score meaning was explained and reinforced to them. The average time taken by each participant at initial contact was 15–20 min. These selected women were followed up in the second and third trimesters during their regular antenatal visits to the clinic and the subsequent data on anxiety levels were collected by a trained research assistant using the same tools.

The data were analysed using SPSS Version 16 with two-tailed significance level of less than 0.05. Frequency and percentage were calculated to determine the prevalence of anxiety. General Linear Model (GLM)-Repetitive Measures test were used to study variations in anxiety along pregnancy period and tested levels of significance among inter-trimester anxiety scores. GLM- Repetitive Measures model is used to model dependent variables measured at multiple times. GLM-Repetitive Measures model can test the main effect on repeated measures between subject’s factors, main effects of within subject’s factors like measurement times, interaction effects between factors, covariates effects, and also effects of interaction between covariates and between-subjects factors (Stevens, 2009).

4. Results

4.1. Socio-personal characteristics

Majority (69%) of the pregnant women were nulliparous. More than half (60%) of them were in the age group 20–24 years. Most (93%) of the women had high school education and above, of which 7.4% had post-graduation and 2% were professionals. Majorities (81.6%) were housewives and 80% belonged to nuclear families. Only 9.6% of the women had a history of abortion due to unknown reasons. Almost all (96%) of them reported having good support system and satisfied marital life (88%). There was no reported family history of mental illness or drug addiction. Forty-three percentages of women had spouse with smoking habit and 12.2% had spouse who consumed alcohol.

4.2. General anxiety during trimesters of pregnancy

All women had moderate (71%) to severe (29%) degree anxiety levels during third trimester. During first trimester also almost all women reported moderate (48.6%) to severe (48.4%) degree general anxiety compared to second trimester. Table 1 reveals that the mean third trimester anxiety score was the highest (106.89) compared to first and second trimesters respectively (100.36, 85.50). The GLM test for these inter-trimester variations were significant ($F = 369.726, P < 0.001$).

4.3. Pregnancy-specific anxiety (PSA) during trimesters of pregnancy

High prevalence of moderate levels of PSA was reported in all trimesters. As shown in Fig. 1 the highest prevalence of (22%)
severe degree of PSA was reported during third trimester. Almost all (99%) women at third trimester had moderate to severe degree of PSA as evidenced by the highest mean scores (126.90) of PSA in Table 2. The inter-trimester differences of means were statistically tested using GLM test. The value of $F \text{(621.225)}$ shows that the PSA across the three trimesters differed significantly at 0.01 levels.

### 4.4. Section-wise results of pregnancy-specific anxiety

Four areas of pregnancy-specific anxiety (PSA) such as anxiety of being pregnant (ABP), anxiety about childbirth (ACB), Anxiety about Breast Feeding (ABF) and Anxiety about New born Care (ANB) were analysed separately.

#### 4.4.1. Anxiety of being pregnant (ABP)

Table 3 reveals that most (69%) of the pregnant women had moderate ABP during the first trimester. Across the trimesters the highest prevalence of 38% severe ABP was reported during third trimester. Inter-trimester differences in the anxiety of being pregnant were tested statistically using GLM test. The value of $F \text{(578.048)}$ shows that in each trimester anxiety of being pregnant differed significantly at 0.01 levels.

#### 4.4.2. Anxiety about childbirth (ACB)

Fig. 2 reveals highest prevalence of 93% severe childbirth anxiety during third trimester. During first trimester 42.4% pregnant women also reported severe childbirth anxiety. The mean scores were also varied with high mean score of 38.70 in third trimesters (Table 4). Inter-trimester variations were significant at 0.001 levels as revealed in Table 4.

#### 4.4.3. Anxiety about breast feeding (ABF)

Prevalence of 42.2% and 36.2% moderate level of ABF were reported during third and first trimester respectively. During third trimester women rated the highest levels of severe degree of ABF. GLM test revealed that inter trimester variations were significant ($F = 35.679, P < 0.001$).

#### 4.4.4. Anxiety about new born care (ANB)

The highest prevalence of (51.4%) moderate and 5.6% of severe ANB were reported during third trimester. GLM test revealed that inter trimester variations were significant ($F = 51.254, P < 0.001$).

### 4.5. Socio-demographic variables and PSA

All the socio-demographic variables showed significant association at 0.05 levels at third trimester PSA. A consistent significance between parity and PSA was noted in all trimesters. Among all socio-personal variables; younger age, parity and type of family were associated with third trimester pregnancy-specific anxiety.

**Table 1**

<table>
<thead>
<tr>
<th>STAI scores</th>
<th>Mild %</th>
<th>Moderate %</th>
<th>Severe %</th>
<th>Mean</th>
<th>SD</th>
<th>GLM test and $P$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAI-1</td>
<td>3.0</td>
<td>48.6</td>
<td>48.4</td>
<td>100.36</td>
<td>13.637</td>
<td>$F = 369.72$</td>
</tr>
<tr>
<td>STAI-2</td>
<td>28.2</td>
<td>60.6</td>
<td>11.2</td>
<td>85.50</td>
<td>12.933</td>
<td>$P &lt; 0.001$</td>
</tr>
<tr>
<td>STAI-3</td>
<td>71.0</td>
<td>29.0</td>
<td></td>
<td>106.89</td>
<td>10.952</td>
<td></td>
</tr>
</tbody>
</table>

STAI-1, 2, 3: State Trait anxiety inventory at trimester one two three respectively.

**Table 2**

<table>
<thead>
<tr>
<th>Mean standard deviation and level of significance of pregnancy-specific anxiety (PSA) across trimesters of pregnancy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy-specific anxiety (PSA)</td>
</tr>
<tr>
<td>-----------------------------------</td>
</tr>
<tr>
<td>PSA-1 (Trimester-1)</td>
</tr>
<tr>
<td>PSA-2 (Trimester-2)</td>
</tr>
<tr>
<td>PSA-3 (Trimester-3)</td>
</tr>
</tbody>
</table>

**Table 3**

<table>
<thead>
<tr>
<th>Prevalence and level of significance of anxiety of being pregnant (ABP) across trimesters of pregnancy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABP scores</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>ABP-1</td>
</tr>
<tr>
<td>ABP-2</td>
</tr>
<tr>
<td>ABP-3</td>
</tr>
</tbody>
</table>

**Table 4**

<table>
<thead>
<tr>
<th>The Mean, SD and level of significance of anxiety about childbirth (ACB) across trimesters of pregnancy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety about childbirth (ACB)</td>
</tr>
<tr>
<td>--------------------------------</td>
</tr>
<tr>
<td>ACB-1</td>
</tr>
<tr>
<td>ACB-2</td>
</tr>
<tr>
<td>ACB-3</td>
</tr>
</tbody>
</table>

ACB-1, 2, 3: Anxiety about Childbirth during first, second and third trimesters.
Younger age group of 18–20 rated high anxiety compared to older groups. Those who belonged to nuclear families reported more PSA and these scores were significant at 0.05 levels.

Both multiparous and nulliparous mothers reported higher third trimester PSA compared to other trimesters. Nulliparous pregnant women (Table 5) reported higher PSA across all trimesters with highest during third trimester PSA (mean 131.40) compared to parous women (mean 116.80). The same pattern was observed along the four component of PSA (Table 6) with highest childbirth anxiety among the nulliparous (mean 39.26).

GLM test revealed significant at 0.05 levels for score differences among nulliparous and parous pregnant women. This indicates that pregnancy-specific anxiety is higher among nulliparous women.

5. Discussion

This study revealed a varied and high prevalence rate of moderate to severe degree of general anxiety (STAI) during the first and third trimester. Previous studies (Faisal-Cury & Rossi Menezes, 2007; García Rico et al., 2010) also reported high STAI score among pregnant women. It has been reported that women with a high general anxiety tend to have more pregnancy-specific anxiety (Alipour et al., 2012; Arch, 2013; Hall et al., 2012).

5.1. Pregnancy-specific anxiety (PSA)

The highest prevalence of pregnancy-specific anxiety was reported during the third trimester. Throughout the course of pregnancy, high levels of PSA were observed in first and third trimester with low prevalence in second trimester contributing to a U pattern. The current finding is consistent with similar finding of U pattern of anxiety in other studies (Lee et al., 2007; Teixeira et al., 2009). Previous studies on pregnancy related anxiety among low risk pregnant women also reported marked increase of PSA in third trimester (Alipour et al., 2012; Hall et al., 2012; Huizink et al., 2004; Körükcü et al., 2010; Laursen et al., 2009; Lynn et al., 2011; Reck et al., 2013).

5.2. Childbirth Anxiety

The current study reported very high prevalence of severe degree of third trimester childbirth anxiety. Nulliparous women reported higher childbirth anxiety than parous mothers; these results are consistent with similar previous studies (Alipour et al., 2012; Hall et al., 2012; Huizink et al., 2004; Körükcü et al., 2010; Laursen et al., 2009; Lynn et al., 2011). Portuguese nulliparous women had reported high third trimester childbirth anxiety (Figueirêdo & Conde, 2011).

The present study revealed high prevalence of pregnancy-specific anxiety especially childbirth anxiety component among nulliparous women. This finding urges that special attention to be given to decrease the childbirth anxiety due to its impact on abnormal pregnancy outcomes mainly of cesarean sections. Previous studies supports this suggestion as their studies also revealed that request for caesarean sections were higher among pregnant women particularly nulliparous with more childbirth fears (Fenwick et al., 2009; Hall et al., 2012; Handelzalts et al., 2012; Laursen et al., 2009; Nieminen et al., 2009; Rubertsson et al., 2014). Evidences also established the relationship between high levels of pregnancy anxiety and adverse labour outcomes such as preterm births, low birth weight and mode of delivery (Catov et al., 2010; Hernandez-Martinez et al., 2011; Loomans et al., 2013; Rauchfuss & Maier, 2011). So current study recommend that the prenatal care should focus on measures to reduce pregnancy-specific anxiety particularly among nulliparous women which would reduce adverse pregnancy outcomes.

5.3. Association of PSA with socio-personal variables

The study revealed that nulliparous status is an influencing factor for high prevalence of PSA. These findings are consistent with previous studies (Alipour et al., 2012; Arch, 2013; Fenwick et al., 2009; Handelzalts et al., 2012; Huizink et al., 2004; Körükcü et al., 2010; Lynn et al., 2011; Teixeira et al., 2009). Evidences show that lack of support and poor marital relationship, dissatisfaction with family members and less social supports as the predictors of anxiety in pregnancy and postpartum period (Karacan & Ancel, 2009; Rubertsson et al., 2014). But, these studies contrary to the present study findings of strong family support, satisfied marital relationship and good family relationship as predictors.

The younger women experienced more pregnancy anxiety which is comparable with reported studies (Arch, 2013; Henderson & Maggie, 2013; Rubertsson et al., 2014).

The nuclear family nature prompted to reduce exposure to traditional knowledge transfer from mother to daughter compared to previous extended family system. The lack of scientific and comprehensive information on childbirth preparation contributed to increased worries related to pregnancy. Though these educated women look for available in formations through magazines, media and friends which were neither comprehensive nor complete, rather it triggered their increased pregnancy-specific anxiety. The public hospitals in Kerala neither have a formal childbirth preparation classes nor a comprehensive hand-out on childbirth.

Table 5

<table>
<thead>
<tr>
<th>Anxiety</th>
<th>Nulliparous pregnant women (N=346)</th>
<th>Parous pregnant women (N=156)</th>
<th>GLM-test</th>
<th>Mean</th>
<th>SD</th>
<th>Mean</th>
<th>SD</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSAI-1</td>
<td>123.65</td>
<td>10.158</td>
<td>107.81</td>
<td>5.83</td>
<td></td>
<td></td>
<td></td>
<td>252.03</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>PSAI-2</td>
<td>107.95</td>
<td>10.882</td>
<td>101.81</td>
<td>8.92</td>
<td></td>
<td></td>
<td></td>
<td>578.05</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>PSAI-3</td>
<td>131.40</td>
<td>10.693</td>
<td>116.80</td>
<td>7.25</td>
<td></td>
<td></td>
<td></td>
<td>51.25</td>
<td>&lt; 0.05</td>
</tr>
</tbody>
</table>

Table 6

The Mean, SD and level of significance of mean scores of each section of PSAI – nulliparous and parous pregnant women using GLM-test.

<table>
<thead>
<tr>
<th>Anxiety</th>
<th>Nulliparous pregnant women (N=346)</th>
<th>Parous pregnant women (N=156)</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABP-1</td>
<td>54.11</td>
<td>47.31</td>
<td>9.93</td>
</tr>
<tr>
<td>ABP-2</td>
<td>45.96</td>
<td>43.69</td>
<td>4.42</td>
</tr>
<tr>
<td>ABP-3</td>
<td>53.57</td>
<td>50.26</td>
<td>4.84</td>
</tr>
<tr>
<td>ACB-1</td>
<td>35.67</td>
<td>33.78</td>
<td>2.31</td>
</tr>
<tr>
<td>ACB-2</td>
<td>31.98</td>
<td>31.86</td>
<td>4.17</td>
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<tr>
<td>ACB-3</td>
<td>39.26</td>
<td>37.44</td>
<td>2.81</td>
</tr>
<tr>
<td>ABF-1</td>
<td>19.68</td>
<td>15.62</td>
<td>2.67</td>
</tr>
<tr>
<td>ABF-2</td>
<td>17.14</td>
<td>14.62</td>
<td>2.82</td>
</tr>
<tr>
<td>ABF-3</td>
<td>20.28</td>
<td>16.29</td>
<td>3.104</td>
</tr>
<tr>
<td>ANB-1</td>
<td>14.21</td>
<td>10.92</td>
<td>2.08</td>
</tr>
<tr>
<td>ANB-2</td>
<td>12.96</td>
<td>11.60</td>
<td>2.985</td>
</tr>
<tr>
<td>ANB-3</td>
<td>16.18</td>
<td>12.71</td>
<td>2.644</td>
</tr>
</tbody>
</table>
preparation for couples. This study highlights the need for formal routine childbirth education made available to all pregnant women to empower them especially the nulliparous pregnant women.

5.4. Clinical Implications

The findings from this study have significant implications for the health care organizations. Antenatal anxiety must be taken care as a top priority to reduce emerging number of caesarean sections and other adverse pregnancy outcomes. A formal antenatal screening for pregnancy-specific anxiety should be a part of routine antenatal check up to identify the high risk groups of pregnant women with pregnancy anxiety and fear. The findings of the present study suggest the necessity of implementing interventions to reduce pregnancy-specific anxiety and thereby positively influence birth outcomes. The increasing number of maternal request for cesarean birth because of high childbirth fear and anxiety can be reduced when proper attention is given to reduce pregnancy-specific anxiety especially among nulliparous women. Authors recommend the implementation of a structured childbirth education for pregnant women as part of the routine antenatal care both in public and private hospitals to ensure well-informed and empowered expectant mothers, which would reduce their pregnancy related anxieties. This study emphasises the need to empower nulliparous women through planned childbirth education to reduce their childbirth anxiety. The authors recommend that childbirth education must be made available in all health care agencies especially in the current setting. Future research is needed to explore the impact of childbirth education on pregnancy-specific anxiety.

6. Conclusion

The study highlights that even with good family support and marital harmony pregnant women in Kerala, India reported high prevalence of pregnancy-specific anxiety especially childbirth anxiety. Nulliparous status, young age and nuclear family status were the identified risk factors of PSA. The high prevalence of pregnancy-specific anxiety could be attributed to low perceived knowledge on childbirth and parenting due to the lack of formal childbirth education in the era of nuclear family norm. This study emphasises routine screening of pregnant women for pregnancy-specific anxiety and provide early preventive measures to reduce pregnancy-specific anxiety which would reduce the adverse pregnancy outcomes. The authors recommend a formal childbirth education for pregnant women in all hospitals in Kerala to enhance childbirth preparation and empower women to cope with the changes and challenges of pregnancy and childbirth.

Conflict of interest statement

There are no organisations with conflict of interest related to the study. The co-authors declare that they have no competing interests.

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