International Journal of Scientific Research and Engineering Development-– Volume 7 Issue 3, May-June 2024

Available at www.ijsred.com

RESEARCH ARTICLE OPEN ACCESS

Prevalence, Psychosocial Factors Associated with Stress Levels and Stress Management Mechanisms Among Pregnant Mothers Attending Antenatal Care in Mbarara Regional Referral Hospital,Mbarara City, Uganda

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Abstract

Introduction: Stress is a physiological response to the mental, physical, or emotional challenges that we experience in our day-to-day life that may cause negative health outcomes (Useche et al., 2017). Worldwide, about 10% of pregnant women and 13% of women who have just given birth experience a mental disorder as a result of stress. The problem is even higher in developing countries estimating the prevalence at about 15.6% during pregnancy (WHO, 2020).The study was about to establish the prevalence, factors associated withstress levels and stress management mechanismsamong pregnant mothers attending ANC in Mbarara Regional Referral Hospital, Uganda.The objectives of the study were; to determine the prevalence of stress levels, establish the psychosocial factors associated with stress levelsand to document stress management mechanisms used by pregnant mothers attending ANC in Mbarara Regional Referral Hospital.**Methods:** The study adopted a hospital facility based cross sectional design and targeted pregnant mothers accessing antenatal services at ANC clinic. A sample size of 370 was selected using consecutive sampling method. A questionnaire method was used to collect data from pregnant mothers and interview guide to the key informants who included midwives and counselors. Quantitative data were analyzed through univariate, bivariate and Multivariate levels of analysis with level of significance at 0.05. Logistic regression analysis was used because the outcome variable (stress levels) was transformed into a binary variable (Yes/No).

Results: Approximately 37.4 % of pregnant mothers had stress, The factors associated with increasing the likelihood of stress included marital status (married) and pregnant mothers who separated with their spouse while those factors that decreased the likelihood of stress included mothers who engaged a lot in drinking alcohol during pregnancy. Thus Pregnant mothers who were married were 4.1 times more likely to develop stress compared to their counterparts who were single (OR= 4.06; 95%CI (1.69-6.87); p=0.004).The results further revealed that pregnant mothers who separated with their spouse were 1.2 times more likely to develop stress compared to those mothers who have never separated with their spouse (OR=1.2; 95%CI (1.27-5.186); p=0.026) and Pregnant Mothers who engaged a lot in drinking alcohol during pregnancy were 40% less likely to develop stress compared to those pregnant mothers who did not (OR=0.4; 95%CI (0.34-0.89); p=0.006).

Qualitative data: Key informants reported "*A crying pregnant mother in her second trimester came to my room with total depression after the doctor disclosing to her that her unborn baby developed Hydrocephalus (water on the brain). During ANC visits, a middle-aged pregnant mother stated that the husband left her helpless; she almost lacks all material things which include food, clothing, and transport for ANC services among others due to serious extra marital sex outside his marriage with a female neighbor. "The husband has cut off all sorts of help, and currently the help she gets is from the relatives*

and in-laws, the rest being got from the husband out of force. This has left her wondering whether she will give birth normally or not. She hates herself and is regretting why she became pregnant, she lives a misery life"

Conclusions and recommandations : The Ministry of Health ought to design and distribute printed guidelines to those attending to pregnant mothers on how they can handle pregnancy related stress at individual (pregnant mother) and health facility levels. The psychological factors that partly contribute to stress levels among pregnant mothers can be handled by health workers mobilizing the husbands to attend ANC visits with the pregnant mothers.

Key words: Prevalence, Psychosocial factors,stress levels,stress management

Introduction

Stress is a physiological response to the mental, physical, or emotional challenges that we experience in our day-to-day life that may cause negative health outcomes (Useche et al., 2017). Pregnancy is a period characterized by numerous simultaneous psychological and physiological changes and may be a stressful event to the mother (Herbell&Zauszniewski, 2019).

Globally, stress affects more than 30 million people of all ages. For example it's predicted to be the second leading cause of morbidity in developing countries. Stress is higher among low-income countries along with maternal and psychosocial factors as determinant factors for its occurrence (WHO, 2021, Fekadu, Miller &Mwanri, 2020). Stress is common with devastating effects on pregnancy, a common global mental health tragedy, which is manifested with depressed mood, feeling of guilt, loss of interest, lack of sleep, and low self-esteem (Leung & Kaplan, 2009). Worldwide, about 10% of pregnant women and 13% of women who have just given birth experience a mental disorder as a result of stress. The problem is even higher in developing countries estimating the prevalence at about 15.6% during pregnancy (WHO, 2020).

In China, one study found that the prevalence rates of pregnancy related stress during the first weeks of pregnancy were reported 91.86 (Tang et al., 2019). The findings of an Iranian study also reported the rates of stress to be 49.1% (Zareipour et al., 2017). In Africa a study done in Ethiopia found out that more than one in ten pregnant mothers and one in 20 postnatal mothers suffer from undetected stress and around half of them have had thoughts of ending their life (Hanlon et al., 2010). Stress is the major disorder for women between the ages of 15 and 44 years in high, low and middle-income countries (WHO, 2009). Stress is currently the leading cause of nonfatal burden when considering all mental and physical illnesses, accounting for approximately 10% of total years lived with disability in low- and middle-income countries. By 2030, stress alone is likely to be the third leading cause of disease burden in low-income countries (4.7%) (Federal Ministry of Health, 2012). Due to its negative impact on pregnancies, there is a need for immediate intervention. Some women may experience their first depressive episode during pregnancy, whereas others with a history of stress are at increased risk for its recurrence, continuation, or exacerbation (Bartellas, 2000). Stress in pregnancy is associated with adverse child outcomes and places women at greater risk for inadequate prenatal care, alcohol use, and poorer weight gain in pregnancy: each of these factors affects the unborn infant and slows fetal growth. The effects can also continue until adolescent time with its negative effects not only on psychology but also physically and socially.

Despite the fact that stress has devastating effects among the pregnant mothers, there have been inadequate health programs intending to reduce it and as a result, it has steadily increased among the pregnant mothers. The prevalence of antenatal stress is at 14% compared to a 10.5% pooled prevalence of postnatal stress. Most antenatal stress prevalence rates found in studies in developing countries is around 20% (Maullik et al, 2005).

In Africa more especially Ethiopia, more than one in ten pregnant mothers and one in 20 postnatal mothers suffer from undetected stress and around half of them have had thoughts of ending their life (Hanlon, et al., 2010). Mothers in Malawi are likely to be stressed during pregnancy due to socio-cultural beliefs, health care providers' attitudes and lack of support/companion (Kumbani et al., 2013).

Despite considerable efforts being made to improve antenatal care, hospital delivery with skilled birth attendant and postnatal coverage (Mamba et al., 2017), mothers in Malawi are likely to be stressed during pregnancy due to socio-cultural beliefs, health care providers' attitudes and lack of support/companion (Kumbani et al., 2013). Childbirth fear continues to have a potential impact on women's wellbeing, and this needs to be addressed directly with constant assessments and adequate care.

In Uganda, the factors that were independently associated with psychosocial distress were having a fair/bad relationship with spouse, low monthly income and having less than two meals a day (Sembatya et al., 2021). Pregnancy among young women in Uganda is often viewed as a social problem because it interferes with expectations regarding educational prospects, self-realization, marital prospects or economic prosperity. Psychological factors may influence risk taking behavior in young adults and the coping style for stress of the transition from adolescence to motherhood is a combination of coping with pregnancy and coping with adolescence (Huizink et al., 2002).To date, no study has been undertaken to assess the relationship between Psychosocial Factors and Stress Levels among pregnant mothers in Mbarara City. An in-depth inquiry into the relationship between Psychosocial Factors and Stress Levels among the pregnant mothers was established in Mbarara Regional Referral Hospital.

Materials and Methods

Study Design, Setting and Procedures

The study employed a cross sectional study design, descriptive and analytical in nature involving both quantitative and qualitative approaches of data collection. The cross-sectional design was preferred because it enabled the researcher to study the cases closely.In this case, the cross-sectional design measured the outcome and exposures at the same time based on how much the stress statements applied to respondent over the past week while only interventions in form of stress management mechanisms by pregnant mothers was considered.

Research approaches. Mixed methods were used as advised by Landsverk et al, (2012). This has been justified by the realization that the challenges of undertaking evidence-based practices and programs are sufficiently complex that a single methodological approach was often inadequate.

3.2 Study Area

The study was conducted atMbarara Regional Referral Hospital (MRRH), the biggest referral hospital in south-western Uganda.The study targeted pregnant mothers accessing antenatal services at OPD department in the ANC clinic. According to hospital reports, 5000 pregnant mothers seek for ANC services at the hospital (including those about to give birth, antenatal mothers).The hospital is a public teaching hospital for Mbarara University of Science and Technology and Bishop Stuart University (BSU) funded by the government of Uganda through the Ministry of Health (MOH). MRRH is approximately 260km from Kampala. The hospital serves a population of over 2.5 million people and has a wide rural catchment area comprising the districts of Mbarara, Mbarara City, Isingiro, Ntungamo, Bushenyi, Ibanda, Kazo, Kiruhura, Buhweju, Mitooma, Sheema and Rubirizi and Rwampara. The hospital also receives patients from Masaka and Kabale, Fort Portal and neighboring countries like Tanzania, Burundi, DR-Congo and Rwanda.MbararaRegional Referral Hospital delivers the highest proportion of all pregnant mothers within the hub with 96% of admissions resulting from delivering of pregnant mothers. Mean admissions were 851 months while the mean number of deliveries was 814 (Ugandan Maternal and

Newborn HUB: Benchmarking Report, March 2013) as a representative of all other health facilities of Mbarara City. Mbarara Regional Referral Hospital was most preferred due to its referral capacity in the region with the best ANC services.

Study Population

The study targeted pregnant mothers accessing antenatal services at ANC clinic. Key informant interviews were also administered on the health workers qualitatively who comprised of midwives and counsellors. These In-depth interviews with these people were to know what stresses the pregnant mothers attending ANC. The purpose of key informant interviews was to collect information from a wide range of people who have first-hand knowledge about the pregnant mothers as far as stress was concerned and their views were supplementing the views collected from the selected pregnant mothers already.

Sampling Procedure

Consecutive sampling was used to select population elements that satisfy the selection criteria (Cochran 2007). The sampling technique involved dividing the study population into homogenous groups based on days of clinic visits (Cohen et al., 2002). In the ANC clinic, about 40 pregnant mothers report on a daily basis. The Antenatal care clinic works from Monday to Friday every week. Therefore using Consecutive sampling, 20 ANC visitswere made to constitute the required sample. This generated a total of 19 respondents per day and 95 per week. The data collection was continued until the total sample size was completed within a period of one month.

Purposive sampling technique on the other hand applied to health workers (midwives and counselors). Purposive sampling technique also called judgment sampling is the deliberate choice of an informant due to the qualities he or she possesses. Simply put the researcher decides what needs to be known and then sets out to find people who can and are willing to provide the information by virtue of their knowledge or experience. The selection wasbased on those working in ANC clinic and those in the counseling department. The sampling technique was used because they are assumed to have unique information concerning the topical issue

Data Collection Procedure

Upon identifying an eligible respondent for the study, various steps were followed. First and foremost a written consent form was sought from the pregnant women to allow them participate in the study. The respondent upon acceptance by signing on the form was introduced to the data collection tool. For the pregnant women that were found stressed at the time of data collection, they were given time to decide and if they decide not to participate due the high stress levels, then they were left out because participation was voluntary. For the participant to be regarded as more stressed, she was determined from the change in moods and the way she responded during researcher's introductory remarks. Participants who were willing to participate in the study were engaged because participation was voluntary. For pregnant women who were more stressed, efforts were made to link them to counselors or midwives that clearly understand their issues to handle the situation. The pregnant mothers willing to participate were requested to dedicate between 20 to 30 minutes for the data collection exercise after their ANC checkup. The principal investigator was assisted by research assistants so as not to keep participants waiting. Given the nature of the participants, arrangement was made to offer refreshments during data collection. They were given clarification prior the study about absence of any incentives or tangible benefits for their participation.

The recruitment process involved working with health workers at ANC who were checking on the pregnant mothers such that once the pregnant mother gets ANC services, then she would be requested to

participate in the study and engaged there and then. A separate room or space with a bench or 1 chair was secured through liaison with the health workers to make data collection comfortable for the participants, given their pregnancy nature.

The introductory part was done before to all the pregnant mothers at the ANC clinic during the health talks. The respondents were also asked some related questions while filling the form containing the important information that addresses the thematic areas. The pregnant mother was then allowed to go home after completing the questionnaire.

Data was collected from the hospital for a period of one month. The research assistants helped in data collection after the training for two days. The training sessions involved briefing them on the purpose of the study, meaning of terms used in the study and the importance of maintaining ethical standards when collecting data from the respondents. The questionnaire was administered to selected pregnant mothers and interviews to health workers

Data Collection Instruments

Questionnaire

The researcher used a questionnaire to collect primary data from the study participants. It comprised of closed ended questions. A standardized research instrument was used to collect data from respondents. The instrument consisted of the demographic variables. The demographic variables in this instrument comprised of gender, age, education level, marital status and stress level. Section B of the instrument consistedof items on the prevalence of stress levels among pregnant mothers using Perceived Stress Scale (PSS), Section C consisted of psychosocial factors associated with stress levels among pregnant mothers using The Depression Anxiety Stress (DASS -21) Scale and Section D consisted of items regarding stress management mechanisms among pregnant mothers using The Brief COPE Model.

The Perceived stress scale (PSS)

The Perceived Stress Scale (PSS)was used to measure the prevalence of stress levels among pregnant mothers attending ANC in Mbarara regional referral hospital. The scale has 10 items. The psychometric properties of this scale-validity and reliability were obtained whereby, the Cronbach Alpha reliability was 0.82.Most of the previous studies have reported the Cronbach's alpha (0.74 to 0.91) for assessing internal consistency of the PSS (Lee, 2012).

The Depression Anxiety Stress (DASS -21) Scale

The Depression Anxiety Stress (DASS -21) Scalecontains 21 items that assess psychosocial factors associated with stress levels among pregnant mothers by Lovibond and Lovibond (1995). Questions were answered through a four-point Likert scale, in which subjects expressed their opinion on each assertion according to the following scheme: (0= did not apply to me at all, 1=applied to me to some degree, 2=applied to me to a considerable degree, 3=applied to me very much). In the current study, the Cronbach's alpha for the Depression, Anxiety, and Stress scales were .97, .92 and .95 respectively (Zlomke, 2009). Cronbach's alpha for DASS-21 scales was .94, .87, and .91 respectively.

The Brief COPE Model

The coping with stress of pregnancy was measured with the modified Brief COPE Model developed by Lazarus and Folkman (1984). This scale included 12 items related to coping with psychosocial hardships in pregnancy life of mothers. The 12 item scale measured the level or the rate at which pregnant mothers cope with stress levels. It was rated on a 4 point scale. The scale has an acceptable internal consistency, with a Cronbach alpha coefficient of 0.72 for the emotion focused scale, 0.84 for problem-focused scale, and 0.75 for the dysfunctional coping scale (Cooper et al, 2008).

Interview guide

Interview guide was used to collect primary data from the key informants who included midwives and counselors.The instrument was mainly unstructured with open ended questions, with room for probing for more relevant information during the interviewing process. The interview guide was researcher administered in nature to save time and ensure high completion rates.It was used to generate in-depth information from the key informants concerning the psychosocial factors associated with stress levels among pregnant mothers.

Quality Control

The researcher ensured quality control by pretesting data collection tools, training and supervising research assistants. During data collection, debriefing meetings were held at the end of each day to review qualitative data/ interviews and identify any omissions and errors.

Pilot Study

A pilot study was taken to pretest the questionnaire for consistency and suitability at the neighboring health facility Mbarara City Health Centre IV. A sample of 37 respondents was interviewed(that is the 10% of the pregnant mothers sampled). The investigator used comments and suggestions from the pilot study to address omissions and vague questions in the study instrument and thus aimed to enhance the questionnaire's reliability and validity.

Validity

Content validity index was used to determine the validity of the instrument. The researcher established content validity of the instruments by making sure that the items on the main variables (independent and dependent variables) conformed to the objectives of the study. The test of content validity was established through inter judge with three research consultants. Each judge rated the items on a two point rating scale of Relevant (R) and Irrelevant (IR). The formula used to calculate CVI was;

$$CVI = \frac{n}{N}$$

Where: n = number of items rated as relevant

N= Total number of items in the instrument

The CVI for the questionnaire was 42/48 which was 0.875 hence being valid since the obtained value was abovethe least CVI recommended in a survey study of 0.70 (Bolarinwa (2015).

Reliability of instruments

Reliability is defined as 'the extent to which test scores are free from measurement error' (Muijs, 2011). The reliabilities of items in the various constructs was tested using Cronbach Alpha (α) method provided by STATA version 17. Reliability for the items in the different constructs was$\alpha = 0.823$, attained at the benchmark of $\alpha = 0.70$ and above (Bolarinwa, 2015). The items thus enabled collection of dependable data once they were passed as reliable. The closer it was to one, the higher the consistency.

Data Management and Statistical Analysis

Data Management

The perceived stress scale (PSS) comprised of 10 items. The overall score ranged between 0-40. A score of ≤ 13 was interpreted as low, 14-26 was interpreted as moderate stress and 27-40 score was interpreted as high/severe stress. Stress levels were determined basing on how much the stress statements applied to

respondent over the past week which determine the low, moderate and high/severe stress based on aggregate scores. For the Depression Anxiety Stress (DASS) scale that contains 21 items, the overall score ranged 0-84. A score of ≤42 was interpreted as not present while 43-84 was interpreted as present. For the Brief COPE Model, it comprised of 12 items with an overall score of 48. A score of ≤ 24 was interpreted as less coping while 25-48 was interpreted as highly coping.

Quantitative Data Analysis

The filled questionnaires were first examined by the researcher to confirm completeness and consistency. Quantitative data was analyzed with the help of STATA Version 13 after being imported from Excel. Quantitative data was analyzed at three levels: the univariate, bivariate and multivariate levels. Under univariate analysis, all variables listed in the conceptual framework were analyzed individually. Frequencies and percentages in tabular form were used for easy understanding while describing population distribution. The prevalence of stress levels was determined as a ratio of participants with high stress levels in terms of percentage.

Under bivariate analysis, chi square test was used to test for statistical significance of the relationship among categorical variables. The P value of equal to or less than 0.05 was rated as a statistically significant relationship while the strength of the relationship between independent and dependent variables was measured with the crude odds ratio (COR). The 95% confidence interval was used to measure reliability of the estimate of the population parameter.

A threshold of $p<0.2$ was set at bivariate level of analysis. Variables that met the threshold were used for further analysis at multivariate analysis. Statistical inference between the independent and outcome variables was drawn by a simultaneous analysis of many parameters of independent variable and outcome variable. The strength of the relationship between independent and outcome variables at 95% confidence interval was determined by comparing adjusted odds ratios (AOR). A P value ≤0.05 was considered statistically significant for multivariate analysis. The influence of most significant independent variables on the outcome variable was determined with logistic regression model to help in adjusting for cofounding variables while interaction among variables was determined with the likelihood ratio test.

Qualitative Data Analysis

Qualitative data analysis derived from interviews involved checking for completeness, transcribing, coding, cleaning, decoding and analyzing manually using the content analysis technique and was presented in tables in form of text or quotations. The collected data was then coded, themes generated and a thematic analysis carried out on the qualitative data. Qualitative data was summarized into themes which offered further explanation and support to the findings from quantitative data. Qualitative data was also presented using narrative analysis by "quoting" respondents' direct words.

Ethical Considerations

Approval to conduct the study was sought from the Bishop Stuart University Research Ethics Committee (REC) REC no. **BSU-REC-2022-28**and Directorate of Graduate Studies, Research, and Innovations at Bishop Stuart University. Administrative clearance was sought from the Hospital Director of Mbarara Regional Referral Hospital and a written informed consent obtained from participants themselves prior to actual data collection. The principal of voluntary participation was strictly adhered to and the respondents not coerced into participating in the study. The purpose of the study was explained to them and assurance given them that the information obtained was treated with confidentiality and that at all times data was presented in such a way that their identity could not be connected with any specific responses. Interviews with key informants were conducted privately for confidentiality purposes

Results

Stress levels among pregnant mothers

The study findings also presented the stress levels among the study participants which depicted how stressed pregnant mothers were during pregnancy. Their responses were presented in figure1.

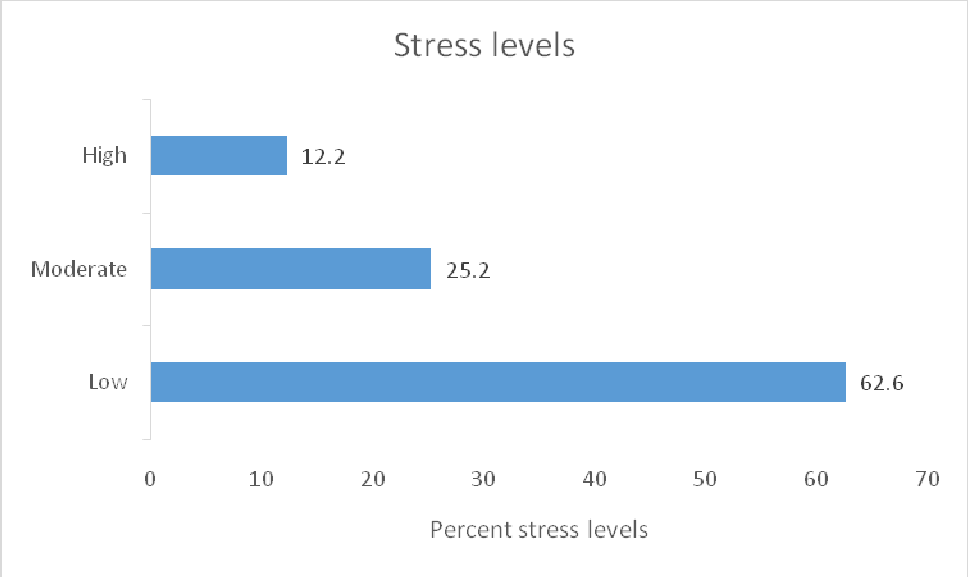

Figure1: Stress levels among pregnant mothers attending ANC services at MRRH

According to the figure 1, majority of the study participants 231 (62.6%) had low stress levels while 93 (25.2%) had moderate and 45 (12.2%) of participants had high stress levels.

Prevalence of stress among pregnant mothers attending ANC in Mbarara Regional Referral Hospital

The researcher considered those participants with moderate and high levels of stress as the ones with stress during the analysis. Therefore the overall prevalence of stress among pregnant mothers attending ANC in Mbarara Regional Referral Hospital was also determined as indicated in figure 2.

Prevalence of stress levels

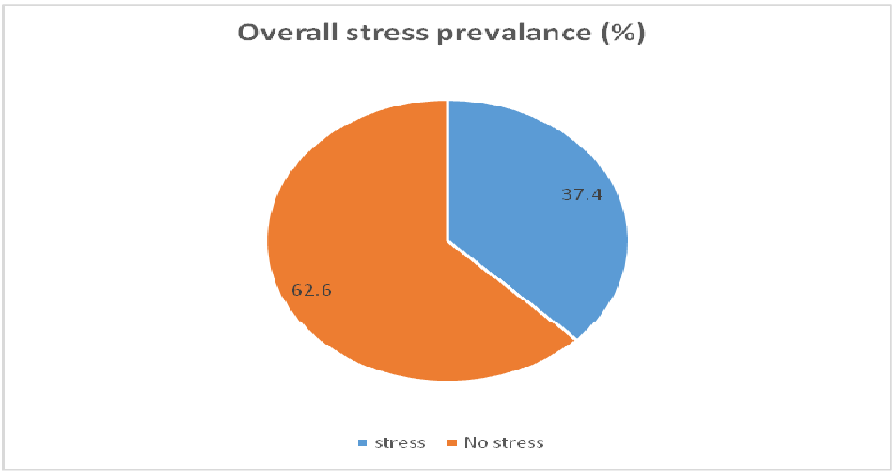

Figure 2: Prevalence of overall stress among pregnant mothers attending ANC at MRRH

From the findings and as presented in figure 4.2, the results revealed that 138(37.40%)of the participants were stressed. The results thus indicated that the prevalence of overall stress among pregnant mothers

attending ANC at MRRH was 37.4%. The in depth interviews also supplemented on the views of pregnant mothers by going ahead to mention the outcomes from the experienced stress levels among pregnant mothers. One of the outcomes from the experienced stress levels was mentioned by key informants as sickness from time to time. This was attributed to the fact that due to increasing stress levels, some of the body systems would be affected hence causing weakness and disease. Other outcomes were mentioned as hatred to the husband, conflictual relationship between pregnant mother and husband or other relatives, loneliness and change in moods

Background information

The study presented the key demographic characteristics of respondents in terms of their age, education level and marital status. The results were presented in table1.

Table1: Percent distribution of demographic characteristics of participants (n=370)

Variable	**n (%)**
Age	
18-28 years	176(47.5)
29-38 years	146(39.5)
39-48 years	48(13.0)
Education	
Primary	190(51.3)
Secondary	91(24.6)
Tertiary	89(24.1)
Marital status	
Single	56(15.1)
Married	303(81.9)
Cohabiting	11(3.0)

Results in Table1 revealed that most (47.6%) of the participants were in age category of 18-28 years of age. These were followed by 39.5% of the participants that were aged 29-38 years and the least 13% that were aged 39-48 years. The study results indicate that majority of the pregnant mothers were aged 18-28 years. This implied that most of the respondentswere of a marriage age and in the prime years of reproduction which meant that they would freely visit the health facilities for ANC services without being shy. These pregnant mothers were likely to have their unique stress levels and factors associated with their stress levels, different from those that were aged more than 28 years.

The results showed that majority (51.4%) of the study participants had attained secondary level of education, followed by 24.6% that had attained primary education level. More 15.7% of the participants had attained tertiary level of education while the least 8.4% of the participants had attained university level of education. This indicated that most of the pregnant mothers attending MRRH for ANC services had attained secondary level of education. This further implied that they were able to appreciate the need for ANC services during pregnancy given their education level. Their education level however put them in a different osition in terms of stress levels compared to the highly educated at tertiary and university.

According to table 4.1, maority of the study participants constituting 81.9% were married culturally or religiously. These were followed by 15.1% who were in the single category while the remaining 3% of the participants were cohabiting. The findings revealed the fact that maority of the pregnant mothers Attending Antenatal Clinic at Mbarara Regional Referral Hospital were married and living with their spouses most of the time. These were thus likely to have change in their stress levels being influenced by how they related withier husbands, their family at large among other personal factors compared to the single and cohabiting categories of pregnant mothers

Factors associated with stress levels among pregnant mothers attending ANC in Mbarara Regional Referral Hospital

Objective 2 was to establish the factors associated with stress levels among pregnant mothers attending ANC in Mbarara Regional Referral Hospital. These included socio-demographic, socio-economic, psychological factors, and biological factors.Cross tabulations were done on the dependent variable (stress status) and each independent variables for the socio-demographic, socio economic and psychological factors. At bivariate level of analysis, The results in table 4.2 reveal that stress levels (at a cut-o□ of 10 perceived stress scale items) was significantly associated among pregnant women who (i) found it hard to wind down(χ^2 = 108.03, p <0.001); (ii) have been smoking during pregnancy (χ^2 = 51.1, p <0.001); (iii) Have been engaged in alcohol drinking ($\chi^2$10.6831 p=0.014); (iv) has been separation with the spouse(χ^2 = 11.03, p =(0.012));(**Table 2**).

Table 2: Stress levels bysocio-demographic and socio-economic factors associated among pregnant women at MRRH (n=370)

Variable	**n (%)**	**No stress levels** (n= 231, 62.6%)	**Stress** (n=138 , 37.40)	χ^2 (***p*-value**)
Age				
18-28	176(47.70)	103(44.59)	73(52.90)	2.48(0.290)
29-39	146(39.57)	96(41.56)	50(36.23)	
40 – 49	47(12.74)	32(13.85)	15(10.87)	
Level of education				
Primary	190(51.49)	111(58.42)	79(41.58)	4.45(0.108)
Secondary	91(24.66)	65(71.43)	26(28.57)	
Tertiary	88(23.85)	55(62.50)	33(37.50)	
Marital status				
Single	56(15.18)	24(42.86)	32(57.14)	**11.65(0.003)***
Married	302(81.84)	201(66.56)	101(33.44)	
Cohabiting	11(2.98)	6(54.55)	5(45.45)	
I found it hard to wind down				**96.1(0.000) ***
Did not apply to me at all	44(11.92)	33 (75.00)	11(25.00)	
Applied to me to some degree, or some of the time	81(21.95)	13(16.05)	68(49.28)	

Applied to me to a considerable degree or a good part of time	85(23.04)	65(76.47)	20(23.53)	
Applied to me very much or most of the time	159(43.09)	120(51.95)	39(24.53)	
I tended to over-react to situations				**51.12(0.000)***
did not apply to me at all	54(14.63)	33(61.11)	21(38.89)	
applied to me to some degree	43(11.65)	6(13.95)	37(86.05)	
applied to me to a considerable degree	94(25.47)	68(72.34)	26(27.66)	
applied to me very much	178(48.24)	124(69.66)	54(30.34)	

Table3a: Psychological factors and Stress levels among pregnant women at MRRH (n=370)

Variable	**n (%)**	**No stress levels** (n= 231, 62.6%)	**Stress** (n=138 , 37.40)	χ^2 (***p*-value**)
Have been smoking during pregnancy				
I haven't been doing this at all	54(14.63)	33(61.11)	21(38.89)	**51.12(0.000)***
A little bit	43(11.65)	6(13.95)	37(86.05)	
a medium amount	94(25.47)	68(72.34)	26(27.66)	
I have been doing this a lot	178(48.24)	124(69.66)	54(30.34)	
Have been engaged in alcohol drinking				
I haven't been doing this at all	40(10.84)	19(47.50)	21(52.50)	**10.6831(0.014)***
A little bit	61(16.53)	31(50.82)	30(49.18)	
a medium amount	84(22.76)	59(70.24)	25(29.76)	
I have been doing this a lot	184(49.86)	122(66.30)	33.70	
I had an intention of being pregnant				
I haven't been doing this at all	30(8.13)	17(56.67)	13(43.33)	3.5775(0.466)
A little bit	67(18.16)	37(55.22)	30(21.74)	
a medium amount	86(23.31)	58(67.44)	28(32.56)	
I have been doing this a lot	185(50.14)	118(63.78)	67(36.22)	
The previous pregnancy aborted				2.6(0.457)
I haven't been doing this at all	354(95.93)	221(62.43)	133(37.57)	
A little bit	1(0.27)	0(0.00)	1(100.0)	
a medium amount	2(0.54)	1(50.0)	1(50.0)	
I have been doing this a lot	12(3.25)	9(75.0)	3(75.0)	
There was death of a relative				3.18(0.529)
I haven't been doing this at all	49(13.28)	26(53.06)	23(46.94)	

A little bit	58(15.72)	35(15.15)	23(39.66)	
a medium amount	87(23.58)	57(65.52)	30(34.48)	
I have been doing this a lot	174(47.15)	112(64.37)	62(35.63)	
There has been separation from spouse				**11.03(0.012)***
I haven't been doing this at all	206(55.83)	130(63.11)	76(36.89)	
A little bit	33(8.94)	15(45.45)	18(54.55)	
a medium amount	43(11.65)	22(51.16)	21(48.84)	
I have been doing this a lot	87(23.58)	64(73.56)	23(26.44)	

Table 3b: Psychological factors and Stress levels among pregnant women at MRRH (n=370)

Variable	**n (%)**	**No stress levels** (n= 231, 62.6%)	**Stress** (n=138 , 37.40)	χ^2 (***p*-value**)
There are tendencies of psychological trauma from family				
I haven't been doing this at all	26(7.05)	16(61.54)	10(38.46)	6.84(0.077)
A little bit	53(14.36)	25(47.17)	28(52.83)	
a medium amount	106(28.73)	67(63.21)	39(36.79)	
I have been doing this a lot	184(49.86)	123(66.85)	61(33.15)	
Family conflict has affected me psychologically				6.57(0.087)
I haven't been doing this at all	84(22.76)	58(69.05)	26(30.95)	
A little bit	41(11.11)	19(46.34)	22(53.66)	
a medium amount	62(16.80)	37(59.68)	25(40.32)	
I have been doing this a lot	182(49.32)	117(64.29)	65(35.71)	
There has been fear of giving birth being my first pregnancy				0.211(0.976)
I haven't been doing this at all	164(44.44)	103(62.80)	61(37.20)	
A little bit	37(10.03)	22(59.46)	15(40.54)	
a medium amount	91(24.66)	58(63.74)	33(36.26)	
I have been doing this a lot	77(20.87)	48(62.34)	29(37.66)	
Parenting of the husband has been neglectful and authoritarian				3.03(0.387)
I haven't been doing this at all	217(58.81)	143(65.90)	74(34.10)	
A little bit	45(12.20)	24(53.33)	21(46.67)	
a medium amount	58(15.72)	35(60.34)	23(39.66)	
I have been doing this a lot	49(13.28)	29(59.18)	20(40.82)	

Summary

The section focused on determining the association between stress levels among pregnant women and the socio-demographic, socio-economic and psychological factors. It presents the bivariate analysis results carried out using the Pearson's chi-square test statistic. The bivariate analysis showed that the stress levels were observed among pregnant women who found it hard to wind,have been smoking during pregnancy, and have been engaged in alcohol drinking and those that had separation with the spouse. The

researcher considered a threshold of p<0.2 and the variables which met this criteria, qualified for the next level of analysis. These variables included socio-demographic, socio-economic and psychological factors (smoking during pregnancy, drinking alcohol during pregnancy, separation with the spouse, tendencies of psychological trauma from family and family conflicts)

Multivariate analysis of factors associated with stress levels among pregnant mothers attending ANC in Mbarara Regional Referral Hospital

Multivariate analysis was performed to assess which factor associated with stress levels among pregnant mothers more than the other. The section presents the multivariate analysis results that were carried out using the binary logistic regression. At a multivariate level, all factors which had p-values below the threshold of 0.2 at the bivariate analysis were included in the multivariate model (Table4). A reference category was selected for each categorical variable.

At the adjusted level of analysis, the results revealed that, Pregnant mothers who were married were 4.1 times more likely to develop stress compared to their counterparts who were single (OR= 4.06' 95%CI(1.69-6.87); p=0.004).Psychological factors which were statistically significant with stress levels include; Mothers who engaged in drinking alcohol during pregnancy, who smoked during pregnancy and who had separated with his/her spouse. Pregnant Mothers who engaged a lot in drinking alcohol during pregnancy were 40% less likely to develop stress compared to those pregnant mothers who did not engage in alcohol drinking at all during pregnancy(OR=0.4; 95%CI(0.34-0.89); p=0.006). The results further revealed that pregnant mothers who separated with their spouse were 1.2 times more likely to develop with stress than those mothers who have never separated with their spouse (OR=1.2; 95%CI(1.27-5.186); p=0.026). Other factors were not statistically significant as demonstrated in table4

Table4: Multivariate analysis results of factors associated with stress levels among pregnant mothers attending ANC in Mbarara Regional Referral Hospital (n =370)

Variables	AOR 95%CI		P_value
socio-demographic and socio-economic factors			
Marital status			
Single	1		
Married	4.06(1.69-6.87)		**0.004****
Cohabiting	1.13 (0.47-2.67)		0.789
Psychological factors			
Have been engaged in alcohol drinking			
I haven't been doing this at all	1		
A little bit	0.70(0.23-2.11)		0.529
a medium amount	0.93(0.37-2.35)		0.875
I have been doing this a lot	0.4 (0.34-0.89)		**0.006****
Have been smoking during pregnancy			
I haven't been doing this at all	1		
A little bit	2.99 (1.14 – 7.87)		**0.026****
a medium amount	2.21 (0.86 – 5.69		0.102
I have been doing this a lot	0.61(0.18-2.02)		0.418
There has been separation from spouse			
I haven't been doing this at all	1		

A little bit	0.57(0.17-1.95)	0.374
a medium amount	0.8(0.222-2.779)	0.395
I have been doing this a lot	1.2 (1 .270-5.186)	**0.026****

***Statistical significant (p≤0.05) at multivariate analysis*

Qualitative data analysis

The quantitative results were supplemented by interview responses from health workers- the key informants. The interview results revealed some of the psychosocial factors included worries about pregnancy, complications to the unborn child and neglect of the pregnant mother by the husband.

In relation to this, one of the mental health counselors had this to say;

"*A crying pregnant mother in her second trimester came to my room with total depression after the doctor disclosing to her that her unborn baby developed Hydrocephalus (water on the brain). This has worried her most and as she thinks she is likely to lose the child or develop permanent disability. This worry has caused her morning sickness with constant backaches. She thinks that such serious health related challenges are likely to affect her life and that of a baby. The current body tests indicate that her blood pressure is high"* (per.com, Mental health counselor, ANC department, October, 2022).

Still on psychological factors as part of the psychosocial factors, another midwife reported thus;

"*During ANC visits, a middle-aged pregnant mother stated that the husband left her helpless; she almost lacks all material things which include food, clothing, and transport for ANC services among others due to serious extra marital sex outside his marriage with a female neighbor. This neighbor in addition, constantly attacks her over the husband. Her bitter words from her female neighbor increase her blood pressure. The same situation had caused miscarriage of her previous pregnancy. She fears that the same thing might happen and this time with serious consequences*" (per.com. Midwife ANC clinic, October, 2022).

Still on psychological factors being associated with stress levels among pregnant mothers, another midwife commented thus;

"*A hopeless HIV/AIDS discordant pregnant mother states that the husband forced her into unprotected sex who ended up conceiving against the constant advice from the counselors and Doctors to adhere taking ARVS as she developed self-hatred and regretting why she never divorced him. Her fear of contracting HIV/AIDS has left her in tension and has abnormaly increased her stress levels with constant heart biting and fearing that anything can happen over her life. The eruption of family conflicts has left the same mother in a state of quagmire. The has mistreated her that once she disclosed the status of the husband, he will kill her and it will be hard for her to stomach it, as a result of this she feels like aborting it*" (per.com.Midwife, October, 2022).

Participants whose pregnancy related factors were moderately felt were 0.6 times less likely to have high stress levels compared to those whose pregnancy related factors were less felt (OR = 0.6, 95%CI: 0.327-1.205, P=0.017). Participants whose pregnancy related factors were highly felt were 0.9 times more likely to experience high stress levels compared to those whose pregnancy related factors were less felt (OR = 0.9, 95%CI: 0.542-1.351, P=0.017).

The qualitative results on the part of pregnancy related factors also supplemented the inferential statistics. One of the midwives in the ANC department had this to say;

"*Pregnancy and recurring and cocktailed diseases in her body accompanied with the husbands' misbehaviors including cheating on her has given her unrest time of worries in gestation period. The husband has cut off all sorts of help, and currently the help she gets is from the relatives and in-laws, the rest being got from the husband out of force. This has left her wondering whether she will give birth*

normally or not. She hates herself and is regretting why she became pregnant, she lives a misery life" (per.com. Midwife at ANC clinic, October, 2022).

Stress management mechanisms used by pregnant mothers attending ANC in Mbarara Regional Referral Hospital

The study sought to determine stress management mechanisms used by pregnant mothers attending ANC in Mbarara Regional Referral Hospital. In response, various statements were reacted to by study participants as represented in the table5.

Table 5: Stress management mechanisms by pregnant mothers attending ANC in MRRH

Statements	1	2	3	4	Mean	Std. Dev.
I've been getting emotional support from others	133 (35.9%)	107(28.9 %)	48 (12.9%)	82 (22.2%	1.324	1.2720
I've been saying things to let my unpleasant feelings escape	52 (14%)	122 (32.9%)	159 (42.9%)	37 (10%)	2.865	1.1794
I've been criticizing myself	77 (20.8%)	167 (45.1%)	82 (22.1%)	44 (11.9%)	2.943	1.0538
I've been getting comfort and understanding from someone	49 (13.2%)	171 (46.2%)	114 (30.8%)	36 (9.7%)	2.770	1.0813
I've been making jokes about it	29 (7.8%)	77 (20.8%)	208 (56.2%)	56 (15.1%)	2.962	1.1470
I've been accepting the reality of the fact that it has happened	25 (6.8%)	55 (14.9%)	217 (58.6%)	73 (19.7%)	2.959	.9965
I've been expressing my negative feelings	23 (6.2%)	81(21.9 %)	157 (42.4%)	109 (29.5%)	3.003	1.0054
I've been trying to find comfort in my religion or spiritual beliefs	42 (11.4%)	66 (17.8%)	137 (37%)	125 (33.8%)	3.027	.9874
I've been learning to live with it	11 (2.9%)	88 (23.8%)	214 (57.8%)	57 (15.4%)	2.965	1.0288
I've been blaming myself for things that happened	62 (16.8%)	177 (47.8%)	82 (22.2%)	49 (13.2%)	2.976	1.0158
I've been taking action to try to make the situation better	08 (2.2%)	33 (8.9%)	253 (68.4%)	76 (20.5%)	2.951	1.0374
I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping	15 (4%)	91(24.6 %)	148 (40%)	116 (31.4%)	2.905	1.0791

Key: 1 =I haven't been doing this at all, 2 = A little bit, 3 = a medium amount and 4 = I've been doing this a lot.

As presented in table 4.5 above, the statement that I've been getting emotional support from others, was reacted to differently whereby 35.9% were not doing it all, 28.9% were doing it a little bit, 12.9% were doing it to a medium amount as 22.2% were doing it a lot. The mean response of 1.324 and standard deviation of 1.2720 were obtained. The statement that I've been saying things to let my unpleasant feelings escape had 14% not doing it all, 32.9% doing it a little bit, 42.9% doing it to a medium amount while 10% were doing it a lot. There was a mean of 2.865 and standard deviation of 1.1794.

The statement that I've been criticizing myself had 20.8% not doing it at all, 45.1% doing it a little bit, 22.1% doing it to a medium amount and 11.9% doing it a lot. There was a mean response of 2.943 while standard deviation was at 1.0538. On the statement that I've been getting comfort and understanding from someone, 13.2% revealed not doing it at all, followed by 46.2% who indicated that they were doing it a little bit, 30.8% who were doing it to a medium amount and 9.7% who were doing it a lot. The mean of 2.770 and standard deviation of 1.0813 were obtained.

To the statement that I've been making jokes about it, 7.8% revealed not doing it at all, 20.8% were making jokes a little bit, 56.2% were making jokes to a medium amount as 15.1% were doing it a lot. The obtained mean was 2.962 and standard deviation of 1.1470. On the statement that I've been accepting the reality of the fact that it has happened, 6.8% were not doing it at all, 14.9%) were doing it a little bit, followed by 58.6% that were doing it to a moderate amount and 19.7% who revealed doing it a lot. Majority showed that they embraced acceptance of the reality of the fact that it has happened. A mean response of 2.959 and standard deviation of 0.9965 were obtained which supported the majority's viewpoint.

This was followed by the statement that I've been expressing my negative feelings whereby 6.2% were not doing it at all, 21.9% were doing it a little bit, 42.4% were doing it to a moderate amount and 29.5% were doing it a lot. A mean of 3.003 and standard deviation of 1.0054 also indicated that the participants were moderately coping with this style. The statement that I've been trying to find comfort in my religion or spiritual beliefs had 11.4% not doing it at all, 17.8% doing it a little bit, 37% doing it a moderate amount and 33.8% doing it a lot. This indicted that most pregnant mothers were trying to find comfort in my religion or spiritual beliefs. The highest mean of 3.027 and standard deviation of .9874 also indicated moderate amount of coping with stress levels among pregnant mothers.

On the statement that I've been learning to live with it, 2.9% were not doing it at all, 23.8% were doing it a little bit, 57.8% were doing it o a medium amount while 15.4% were doing it a lot. There was a mean response of 2.965 and standard deviation o 1.0288. Hence majority of participants have been learning to live with it, a coping mechanism. The statement that I've been blaming myself for things that happened, had 16.8% not doing it at all, 47.8% doing it a little bit, 22.2% were doing it to a medium amount and 13.2% were doing it a lot. There was a mean response of 2.976 which indicated that participants were moderately coping with this style while standard deviation of 1.0158 indicated divergence of views.

On the statement that I've been taking action to try to make the situation better, 2.2% were not doing it at all, 8.9% were doing it a little bit, 68.4% were doing it to a medium amount and 20.5% were doing it a lot. A mean of 2.951 was obtained on the statement which meant support of the coping mechanism by participants although standard deviation of 1.037 meant divergence of views. This implied that to a large extent, pregnant mothers have been taking action to try to make the situation better as far as stress level management was concerned. The statement that 'I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping' had 4% not doing it at all, 24.6% doing it a little bit, 40% doing it to a medium amount and 31.4% doing it a lot. A mean of 2.905 and standard deviation of 1.079 were obtained. Findings indicated that to a large extent, pregnant mothers have been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.

The interview results also mentioned some of the coping mechanisms that have been devised for pregnant mothers to cope with stress levels. One of the coping mechanisms was mentioned as having enough rest to regain energy during pregnancy, the other coping mechanisms being having exercises regularly, attending the recommended ANC visits and balancing work and family chores. The interview results also mentioned the fact that they were relying on counselors and health workers for advice on how to manage stress.

The study further summarized the participants' views on coping mechanisms used while attending ANC in Mbarara Regional Referral Hospital into levels of coping as presented in Figure 3.

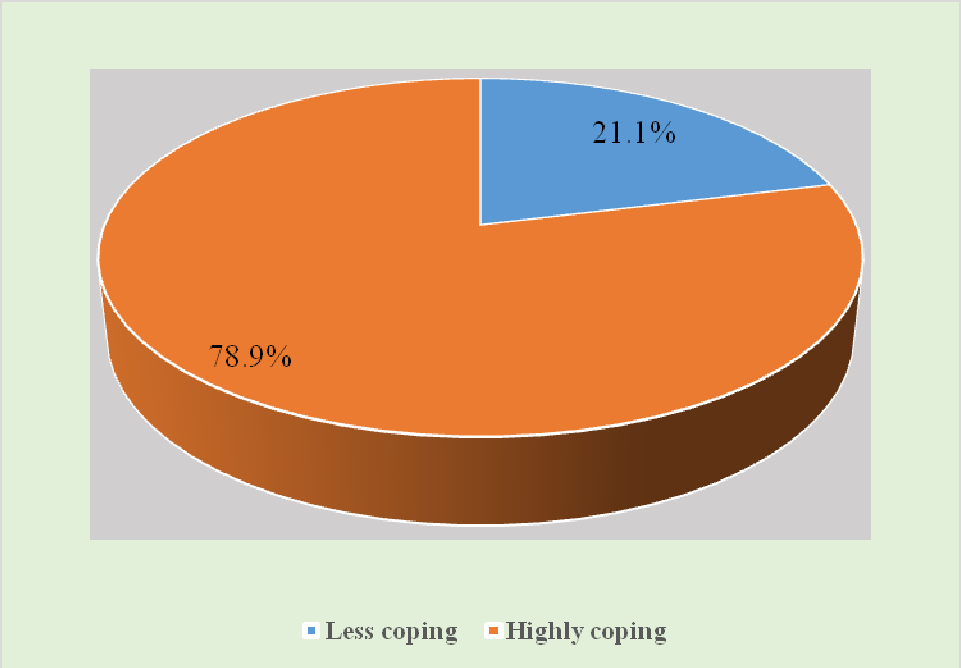

Figure 3: Level of coping with stress levels among pregnant mothers attending ANC at MRRH

As revealed in figure 4.3, majority of the participants constituting 292 (78.9%) were said to be highly coping with stress levels during pregnancy while the remaining 78 (21.1%) of the study participants were less coping with stress levels. The findings indicated that majority of the pregnant mothers attending ANC at MRH were highly coping with stress levels that came with pregnancy.

On the psychosocial support that has been given to pregnant mothers to manage stress levels, the interview results revealed that there has been counseling for the pregnant mothers whose stress levels are high. More psychosocial support strategies offered to pregnant mothers to manage stress have been health education on stress management, advising them to regularly make exercises, conflict resolution among conflicting couples through couple counseling among others.

On whether the health workers had assessment tools to determine stress levels for appropriate redress, majority of them revealed that they did not have specific assessment tools for stress levels but asserted that they captured this information on the general ANC visit form. This consequently enabled them to establish the stress levels for the different pregnant mothers.

On whether they make follow-ups to pregnant mothers with high stress levels, majority of the key informants revealed that they did not make follow ups on pregnant mothers with high stress levels. This was attributed to the fact that they had limited personnel to make follow-up visits to the homes of stressed pregnant mothers. They thus waited for the pregnant mothers who needed their assistance to come to the health facility for stress management.

The interview results indicated that they usually referred pregnant mothers with high stress levels to the specialized mental health counselors because they would be given time and listened to as required and consequently would have their stress problems half or entirely solved. Others revealed that they referred high stress pregnant mothers to physiotherapists for the appropriate assistance depending on the cause and effect of stress on these pregnant mothers.

Discussion of findings

Attempts were made to generate discussion based on the study findings which were statistically significant at multivariate level of analysis to generate more understanding of the issues concerning prevalence, psychosocial factors associated with stress levels and stress management mechanisms among pregnant mothers attending ANC in Mbarara Regional Referral Hospital, Mbarara City, Uganda. The discussion is followed by conclusions and recommendations.

Prevalence of stress levels among pregnant mothers attending ANC in Mbarara Regional Referral Hospital

The prevalence of stress levels among pregnant mothers attending ANC in Mbarara Regional Referral Hospitalwas 37.4%. The prevalence was attributed to fact that all stress levels including low, moderate and high stress were combined to determine the prevalence of stress among pregnant mothers attending ANC. This prevalence was greater than the global and that of the developing countries. For instance, it is noted that approximately 10% of pregnant women suffer from mental disorders, particularly depression when calculated on a global basis although this figure has been reported to be higher (16%) in developing nations (Verbeek, et al., 2015). The prevalence of stress during pregnancy has been found to range from 6% to as high as 52.9% in developing countries (Shakya et al., 2008).

This figure is slightly higher than a study conducted in Saudi Arabia (33.4%) (Ahmed et al, 2017), India (33.3%) (Pais&Pai, 2018), Nepal (34.2%) (Pantha et al, 2014) and Ghana (28.6%) Boakye-Yiadom et al, 2015. On the other hand, it is higher than the study done in the USA (6%) (Woods et al, 2010) and Iran (5.5%) (Shishehgar et al, 2014).

However the prevalence in this study is lower than that quoted by Woods, (2010) in which stress during pregnancy is reported to be common, with 78% experiencing low to moderate and 6% high stress. In Africa studies employed in democratic republic of Congo, Nigeria and Ghana show that the prevalence of perceived stress during pregnancy was 1%, 46.7% and 28.6% respectively (Boakye-Yiadom, 2015; Awati et al., 2018).

Factors associated with stress levels among pregnant mothers attending ANC in Mbarara Regional Referral Hospital

At multivariate level analysis, only marital status (married), psychological factors and pregnancy related factors remained significantly associated with stress. Participants who were married more likely to experience high stress levels compared to those who were single. The above findings are attributed to the fact that married pregnant mothers were doing multiple tasks and had many responsibilities to fulfil both at workplace and family levels. This a lot of time and commitment towards fulfilling the normal day to day tasks in addition to the burden of pregnancy. Hence they were disturbed by these competing tasks and roles, consequently triggering or worsening their stress levels. The findings are in agreement withthe study by Keramat et al (2021) whichdemonstrated a statistically significant association between the presence of antenatal anxiety and women's occupation, evidencing that housewives had a greater chance of developing anxiety during pregnancy than working women. This finding is similar to that found by a researcher in a study conducted in Brazil (Silva et al, 2017).

Participants who separated with their spouse experienced stress levels this could be attributed to loneliness. Negligence and Lack of care by during pregnancy and ANC hence those pregnant mothers felt psychological torture. The findings are in agreement with findings by Satyanarayana et al, (2011) who established that many psycho-social risk factors contribute to distress in pregnancy due to negligence by their spouse. This may further be attributed as per key informant by domestic violence, stressful life events and poor social support, family stress, including family conflicts, troublesome relationship between

mother-in-law and daughter-in-law, a unique and ubiquitous issue in China, also put pregnant women at a higher risk of pregnancy related stress (Lau et al., 2011, Yu and Zhu, 2010).

It was further the findings established that participants who engaged a lot in alcohol drinking during pregnancy reduced significantly the odds of being stressed. Although there is no safe time for alcohol use during pregnancy, some pregnant mothers engage in drinking it. Alcohol can cause problems for the baby throughout pregnancy including. Previous studies have noted that overall maternal alcohol consumption, including first-trimester or late pregnancy use can be associated with intrauterine growth restriction as well as an increased risk of stillbirth. Other researchers have identified that alcohol use during pregnancy is associated with the accumulation of stressful life events experienced by the pregnant mothers. The findings are in agreement with Larissa et al.,2019 whose study results revealed an association between stressful life events and dependence or risk consumption of alcohol in pregnant women.Health workers can help pregnant women to identify or strengthen healthy coping styles in the face of stress, thus intervene and avoid alcohol consumption during pregnancy.

Stress management mechanisms used by pregnant mothers attending ANC in Mbarara Regional Referral Hospital

The study established that some of the pregnant mothers have been expressing their negative feelings. It was further established that pregnant mothers have been trying to find comfort in their religion or spiritual beliefs. Furthermore, in a recent study of 230 predominantly low-income women enrolled in a program for pregnant smokers, a specific type of spiritual coping style focused on surrendering one's problems to God was associated with lower levels of stress during pregnancy (Clements &Ermakova, 2012). The results of this small set of studies suggest that coping efforts involving positive appraisal or religious faith are associated with better psychological adjustment during pregnancy.

To other pregnant mothers they have been blaming themselves for things that happened. Further findings revealed that pregnant mothers have been learning to live with the situation. The finding is in agreement with White et al., (2008) that coping with pregnancy through positive appraisal which involves efforts to create positive meaning by focusing on personal growth has been associated with better maternal attachment, fewer depressive symptoms, and lower global and pregnancy-related distress.

To another significant number, they have been making jokes about it. The above findings are in support of McLeish &Redshaw (2017) who established that through counseling services pregnant mothers can receive prenatal counselling to help them cope with stress and transition to their new identity. These counselling services should focus on devising strategies to assist unmarried pregnant mothers to cope with common stressors such as disclosure of pregnancy to parents and negotiating relationships with partners. Peer support, particularly from other young mothers may improve emotional outcomes of unmarried pregnant young women through forming relationships that reduce feelings of isolation and increase feelings of empowerment and capability through sharing of similar experiences.

On the contrary to the above coping mechanisms, Fullana et al. (2020) found that simple proactive coping strategies (a healthy diet, having some hobbies, having the opportunity to stay outdoors and follow a routine) were associated with lower anxiety and depression in a general population convenience sample.

Conclusions

The prevalence of stress levels among pregnant mothers attending antenatal care in Mbarara Regional Referral Hospital was found to 37.4%. This prevalence is fairly high compared to other estimates from other studies. Stress among pregnant women is increasingly becoming a public health problem, yet little or no attention is being given to deal with the situation. Failure to handle the ever increasing stress levels among pregnant mothers is likely to lead to negative maternal and child health outcomes.

It is evident that psychological factors and pregnancy related factors are significantly associated with stress levels among pregnant mothers attending ANC at MRRH. More often pregnancy comes with worries and expectations about different aspects which is common among most mothers of reproductive age. It is through these worries that when not timely answered by their loved ones result in stress. Also pregnancy worries most mothers in terms of giving birth, fear of having disabled child and concern about appearance which to some extent cause stress levels to increase.

Owing to the existing stress levels during pregnancy, pregnant mothers have tried to cope on their own to reduce their stress depending on the level at which it is. Few of the pregnant mothers have consulted mental health counselors or health workers specifically on the problem of pregnancy stress. Hence this issue has not been given due attention yet it has serious maternal and child health outcomes in severe levels.

Recommendations

The Ministry of Health ought to design and distribute printed guidelines to those attending to pregnant mothers on how they can handle pregnancy related stress at individual (pregnant mother) and health facility levels.

In addition to the above, the Hospital management should design a form that captures stress levels among pregnant mothers such that it can be used by health workers (midwives and nurses) when attending to pregnant mothers during ANC visits. This will help in guiding them on the appropriate course of action towards the pregnant mothers that are fond to be stressed.

The psychological factors that partly contribute to stress levels among pregnant mothers can be handled by health workers mobilizing the husbands to attend ANC visits with the pregnant mothers. The mobilized husbands should then be sensitized and encouraged to show and demonstrate love to these pregnant mothers and be there for them including counseling them on their different worries and fears.

Pregnancy related factors that contribute to stress levels can be minimized by addressing some of the worries to the health workers during ANC visits whereby pregnant mothers should ask whatever they want concerning pregnancy. In this case, some of their worries can be addressed hence reducing the stress levels that come with such.

The health workers should try to sensitize pregnant mothers on the need to avoid events or aspects that cause unnecessary stress at home or workplace. In so doing, they will be able to reduce on their stress levels and consequently have positive maternal and child health outcomes.

The health workers especially those attending to pregnant mothers

Authors' abbreviations

JK: Julius Kuzirimpa; NN: NovetusNyemara, ATO: Anne TweheyoOtwine;
WBL Waswa Bright Laban

Authors' contributions

The authors of this manuscript made the following contributions to this manuscript Concept: JK, conceived the concept & Data collection; JK, WBL, Data analysis::JK, NN, ATO, WBL First draft; JK, NN, ATO, WBLFinal revision: JK, NN, ATO, WBL Read and approved final manuscript:

Acknowledgements

We would like to thankall the study participants, without whom this study would not have been possible. We are grateful

Competing interests

The authors declare that they have no competing interests.

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