

Antenatal Depressive Symptoms in Rwanda: Rates, Predictors, and Social Support

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Abstract

Background

Prevalence of perinatal depression is high in Rwanda and has been found to be associated with the quality of relationship with partners. This study extends this work to examine the relationship between antenatal depressive symptoms and social support across several relationships among women attending antenatal care services.

Methods

Structured survey interviews were conducted with 396 women attending antenatal care services in 4 health centers in the Southern Province of Rwanda. The Edinburgh Postnatal Depression Scale (EPDS) and Maternity Social Support Scale (MSSS) were used to assess antenatal depressive symptoms and the level of support respectively. Socio-demographic and gestational information, pregnancy intentions, perceived general health status, and experience of violence were also collected. Univariate, bivariate analyses and a multivariate logistic regression model were performed to determine the relationship between social support and predictors of antenatal depressive symptoms.

Results

More than half of respondents were married (55.1%) or living with a partner in a common-law relationship (28.5%). About a third (35.9%) were in their 6th month of pregnancy; the rest were in their third term. The prevalence of antenatal depressive symptoms was 26.6% (EPDS \geq 12). Bivariate analyses suggested that partner and peer support negatively predict depression level symptoms. Adjusting for confounding variables such as unwanted pregnancy (AOR: 0.415, CI: 0.221- 0.778), parity (AOR): 0.336, C.I: 0.113– 1.000) and exposure to extremely stressful life events (Odds Ratio = 2.300, C.I. = 1.263–4.189), husband/partner support (AOR: 4.458, CI: 1.833- 10.842) was strongly significantly associated with antenatal depressive symptoms such that women reporting good support were less likely to report depression level symptoms than those reporting poor support or those with no partner. Peer support was no longer significant.

Conclusion

The study revealed that social support may be a strong protector against antenatal depressive symptoms but only support from the partner. This suggests that strengthening support to pregnant women may be a successful strategy for reducing the incidence or severity of maternal mental health problems, but more work is required to assess whether support from peers can compensate for absent or unsupportive partners.

Background

Despite the overriding expectation of pregnancy as a joyous occasion, it is a time of dynamic changes, full of anticipation and preparation. Unfortunately, for many women, pregnancy is also a catalyst for the onset of a new depressive disorder or a precipitant for recurrent depression [1, 2]. Perinatal mental health issues constitute an important public health problem, having a significant impact on the mother, the family, the husband or partner, mother-baby interactions, and on the long-term emotional, and cognitive development of the baby [3, 2]. Antenatal depression is a major health burden and is the most prevalent mental disorder in the perinatal period [4]. It is a non-psychotic depressive episode that occurs in the last trimester of pregnancy and is characterized by mild to severe symptoms that occur during pregnancy. It is associated with decreased interest in almost all pleasurable activities, sad mood, hopelessness, sleep disturbance, fatigue, changes in appetite, suicidal ideation, feelings of worthlessness, lack of concentration, reduced self-esteem and confidence [3, 4]. Antenatal depression has also been found to be a risk factor for pre-term birth and low birth weight, infant under-nutrition, and stunting, as well as higher rates of diarrhoeal diseases [15]. Additionally, antenatal depressive symptoms have the potential to impact negatively upon health service utilization and thereby contribute to increased perinatal complications and maternal mortality [17]. Hence, there is growing evidence that antenatal depression not only affects pregnancy and neonatal outcomes, but also leads to postnatal depression and has influence on offspring's cognitive development, emotions and behaviors in childhood [4]. However, despite its adverse effects on maternal and child health, less known about the magnitude and risk factors of maternal depression during pregnancy in developing countries [5], and antenatal depression is often overlooked in routine screening [6].

The prevalence estimates of antenatal depression can vary across regions globally [6], however, the burden of antenatal depression is generally higher in low- and middle-income countries (LMICs). In high-income countries, the prevalence of maternal depression ranges between 7 to 15% [9,8], while in low and middle-income countries (LMIC), the prevalence measured by both screening or diagnostic tools is as high as 20–26% according to Abrahams and colleagues [9,4]. A systematic review of studies conducted in LMICs reported the prevalence of common perinatal mental disorders (CPMDs) including antenatal depression to be 15.6 % [7], but a study by Gelaye and colleagues reported that the pooled prevalence estimates of antenatal depression was as high as 25.3% in LMICs [8]. Thus, there is considerable disagreement about the prevalence of antenatal depression in LMICs, which may be the result of using different cut-off scores on depression scales, different populations (hospital versus community or clinic samples) and country-wide differences in risk factors. A systematic review by Sawyer and colleagues in 2010 of studies with women in Africa reported estimate rates of antenatal depression to range between 12.5 to 27.1% [10] while in a recent systematic and meta-analysis on the prevalence of antenatal depression in Africa, the pooled prevalence of antenatal depression was reported to be 26.3% [3]. Thus, the variability in estimates is also observed across the African continent.

In Rwanda, a small country of 12 million people located in East Africa, mental health problems are prevalent. Findings from a recent 2018 Rwanda mental health survey revealed increasing prevalence of different mental disorders in the general population, ranking depression among the most prevalent disorders [11]. Given that a history of mental health problems is a risk factor for perinatal depression,

these high rates of mental health issues suggest that high rates of antenatal depression will also be found. To date, however, there has been limited research on prevalence rates, social support and predictors of antenatal depression in Rwanda. A recent study by Umuziga and her colleagues found relatively high rates of women at risk of antenatal depressive symptoms (37.6%) in a sample of 165 perinatal women [12], using cut off scores of over 10 on the Edinburgh Postnatal Depression Survey (EPDS) [13].

The elevated rates of antenatal depression in low- and middle-income countries (LMICs) may be attributed to difficult living conditions experienced in these settings. This includes both material and social challenges and exposure to stressful life events. Known risk factors for maternal mental health problems include social factors such as poverty, low education levels, poor social support, and marital problems [8]. Dadi and colleagues concluded that antenatal depression is commonly associated with economic difficulties, bad obstetric history, poor support from relatives, previous mental health problems, and unfavorable marital conditions [3].

Consistent with other research on perinatal depression, both globally and in Africa more specifically, the study by Umuziga and colleagues in Rwanda found risk factors for antenatal depression including a poor relationship with one's husband or partner, having many children, being a very young mother (under 24), and exposure to stressful life event. However, this study did not explicitly measure social support and did not look at other relationships beyond that with the partner/spouse. Moreover, many of the women in this study were visiting a hospital based neonatal clinic and so may not have been as representative of a community sample as a sample drawn from community health centres. Finally, the pregnant subsample in this study was relatively small, at only 85 women, further limiting generalizability.

Availability of social support, which refers to receipt of emotional, material or information resources (received support) or the perception that resources are available if needed (perceived support), has been identified as important to preventing and coping with maternal depression [17]. In Rwanda, a recent study has shown that perinatal depression is more likely in the face of a poor quality spousal relationship or difficulties with in-laws, or being a single mother [12, 16]. Dennis also highlighted the importance of the quality of social relationships with people outside of the immediate family [18]. The goal of the present research was thus to obtain an estimate of rates of antenatal depression in women attending antenatal care services in community clinics in different centres in the Southern Province and to explore the role of social support as a protective factor to the development and severity of antenatal depression.

Methods

Design, population and setting

A descriptive cross-sectional, health facility-based survey was conducted from June to July 2019. The study utilizes baseline data from a quasi-experimental study on the impact of health provider mentorship and peer support. G*Power software as a free power analysis program for variety of statistical tests commonly used in the social, behavioral, and biomedical sciences [20] was used to determine the sample

size. A total of 396 pregnant women receiving regular antenatal care who were in their 6th month of pregnancy or above were recruited from four randomly selected health centers of Southern Province in Rwanda. Participants ranged in age from 16 to 45 years of age (M =30.8 SD = 6.58).

The study sites were selected using simple random sampling by picking the name from the box [21] In total, four sites with matched characteristics were included in this study. Convenience sampling was used to select participants; all pregnant mothers attending their antenatal care services who were in their 6th month of pregnancy or later were recruited for the study, with the help of a midwife/nurse in charge of antenatal care. The researcher also used the antenatal care registry to identify women who were eligible but who did not have their appointment within the period of data collection in order to also include them. The Community Health Workers in charge of maternal and newborn care (ASM) affiliated with each clinic helped to reach these other women.

Measures and data collection process

A structured questionnaire was used to obtain socio-demographic information of participants, gestational and obstetric information, risk and protective factors, physical and mental health and maternal social support.

Socio-demographic variables included age, marital status, social-economic class, education and occupation. Socio-economic class (*ubudehe*) has four categories. None of the women were in the fourth, or highest, category so only the lowest three are reported.

Pregnancy and maternity information questions included, gestational age (number of months pregnant); type of last delivery (normal vaginal, vaginal with complications, caesarian section), sex preference for the infant; pregnancy intention (wanted or not), planned pregnancy (yes or no) and parity. A one-item measure of overall self-rated physical health for self was used to measure health. Participants were also asked if they were currently ill.

Risk and protective factors. Participants were also asked to identify prior exposure to any stressful events by indicating exposure on a checklist of events (e.g., experience of gender based violence, childhood abuse, stranger violence, etc.) and to describe their relationship with their husband/partner (strong versus poor).

Depressive symptoms. Antenatal depressive symptoms were assessed using the Edinburgh Post-Natal Depression Survey (EPDS) [16]. This tool has been widely used in sub-Saharan Africa and is valid and reliable for testing both severity and probability of depression during perinatal period in multiple countries and languages [22, 6]. The EPDS has been validated as a screening tool for antenatal depression in the three previous studies in Rwanda and was reported to be reliable tool for screening antenatal depressive symptoms with Cronbach alpha values of 0.89 [15,18]. We followed the recommendation of Gureje and colleagues [6] to use a score of 12 or higher to define case level depressive symptoms (hereafter referred

to as 'depression'). The EPDS was also found to be reliable in this study, with a Cronbach's Alpha value of 0.894.

Social Support was measured using a modified version of the Maternal Social Support Scale (MSSS), developed by Webster and colleagues [23]. The original scale is a brief 6-item survey measuring support from spouse, friends and family on a five-point Likert scale for each item. The current scale was expanded from 6 to 12 items to include additional supports deemed relevant in the Rwandan context (in-laws, community members, neighbours). The Cronbach's Alpha value was 0.739 for the full scale. However, an exploratory principal axis factor analysis, with oblim rotation, was performed to confirm that the translated and revised scale measured spousal relationships, peer relationships and family relationships as intended. The best solution based on an analysis of the scree plot and eigen values generated four factors. The first factor, with an eigen value of 3.32, explained 30.17 % of the variance. This factor described the relationship with husband/partner. Items loading on this factor included: my husband helps me a lot, there is conflict with husband, I feel loved by husband with factor loadings of 0.80; -0.77; 0.95 respectively. The second factor, with an eigen value of 1.77, explained 16.09% of the variance, and reflected support from friends/peers. The following items loaded on the second factor: I have good friends who support me, I have neighbours who support me, I have people in the community who support me, with factor loadings of 0.74, 0.86, 0.78, respectively. Conflict with nuclear family and extended family loaded onto a third factor with an eigen value of 1.33, which explained only 12.07% of the variance (loadings of 0.60, 0.60 respectively), and conflict with in-laws loaded onto a fourth factor (at 0.49), with an eigen value of 1.03, explaining 9.39% of the variance. Two items did not load onto any factor: support from nuclear family and control by husband. These items were therefore excluded. These scores on the last two factors were highly skewed and so were excluded from further analyses. Maternal social support was therefore measured using the means of items from factor 1, husband/partner support, and factor 2, friend support, respectively. Scores were categorized into poor versus good support, based on the mid-point of the 5-point scale, with scores of 1 to 2 coded as poor support, and 3 to 5 coded as good support. For partner support, a third category of no partner was also included.

Data analysis

The data were analyzed using SPSS version 21. Univariate, bivariate, and multivariate logistic regression analyses were performed to summarize the dependent and independent variables, and examine the relationship between the independent variables and antenatal depressive symptoms. The binary logistic regression analyses were conducted between statistically significant variables in the bivariate tests and antenatal depressive symptoms.

A multivariate logistic regression analysis was employed to identify independent risk factors of antenatal depression. Antenatal depression was coded as "1" for antenatal depressive symptoms (EPDS \geq 12 scores) and "0" for the absence of depressive symptoms (EPDS <12 scores). Variables were entered for multivariate logistic regression analysis if they achieved statistical significance ($p < .05$) in the bivariate

analysis. Estimated associations were described using odds ratios (OR) with 95% confidence intervals (CIs).

Ethical considerations

Data collection was obtained from the University of Rwanda Institutional Review Board of the College of Medicine and Health Sciences. Written permission to conduct the study was granted by Muhanga and Kamonyi Administrative Districts. All participants provided written consent. Participants under the age of 18 (the age of majority in Rwanda) signed assent forms and their parents/guardians provided written consent. Participants who were found to have EPDS scores above 10 (possible depression) or who endorsed item 10 (suicidal thoughts) were first informed of their scores and then allowed to decide whether or not to seek treatment. If they accepted treatment, they were helped to make an appointment with the mental health team after they had completed their medical appointment.

Results

Participants' sample characteristics

Sample characteristics were determined using frequencies, means, and standard deviations. The sample was comprised of 396 participants from age 16 to 45 years. Participant characteristics are provided in Table 1. Almost a half (47%) of the sample were in the range of 25 to 34 years old; the mean age was 30.8 and standard deviation (SD) was 6.583. Most of respondents were married (55.1%) or living with a common-law partner (28.5%). Most had not completed primary school and the main occupation was farming and cultivating clops (77.3%). A third of the pregnant mothers (35.9%) were in their late second term (6 months of pregnancy). Three quarters (74.7%) reported a wanted pregnancy, however, more than a third (35.9%) did not plan for it. More than a half (58.6%) of respondents had given birth to 1 to 3 children and about half (50.3%) of had a normal vaginal delivery. Almost half (43.9%) described their general health status as neither good nor bad.

Prevalence of antenatal depressive symptoms

Scores on the Edinburgh Postnatal Depression Survey (EPDS) for the entire sample ranged from 0 to 30 (M= 8.86, SD = 6.501). Women who reported scores of 12 or greater on the EPDS were coded as having symptoms of antenatal depression. Table 1 provides the descriptive statistics for the overall sample, and for the women with and without antenatal depressive symptoms. For the overall sample, a total of 26.6% of pregnant women were found to have antenatal depressive symptoms. The prevalence of antenatal depressive symptoms was particularly high among pregnant women aged 24 or less (29.5%) and 35 or more (29.6%), those not living with a partner (49.2%); who had not completed primary education (33,8%); were not employed (33.3%); were in the lowest socioeconomic class (46.8%). Prevalence was also particularly high among pregnant women with unwanted pregnancy (53%), unplanned pregnancy (45.1%), who had four or more children (40%) or who had experienced at least one stressful life event (48.8%). However, among socio-demographic variables, only marital status ($p<0.001$), economic wealth

class ($p=0.01$), and having experienced a stressful life event ($p<.001$) were found to be significantly related to depression level symptoms. For women's gestational information, antenatal depressive symptoms were significantly associated with parity ($p=0.04$), and both unwanted and unplanned pregnancy (both at $p<0.001$). Also, perceived health status and being currently ill were statistically significantly associated with depressive symptoms (both at $p<0.001$).

Table 1: Sample characteristics and factors associated with antenatal depressive symptoms among women attending antenatal care services in Southern Province in Rwanda.

Sample and socio-demographic characteristics	Total	Not depressed (EPDS \geq 12)	Depressive symptoms	P-value
	N (%)	N (%)	N (%)	
	396 (100%)	291 (73.5%)	105 (26.5%)	
Age (Mean: 30.8; SD: 6.58)				
24 or less	95 (24)	67 (70.5)	28 (29.5)	0.354
25-34	186 (47)	143 (76.1)	43 (23.1)	
35 or more	115 (29)	81 (70.4)	34 (29.6)	
Marital status				
Single/separated/divorced/widow	65 (16.4)	33 (50.8)	32 (49.2)	0.000*
Married	218 (55.1)	169 (77.5)	49 (22.5)	
Living together as spouses	113 (28.5)	89 (78.8)	24 (21.2)	
Level of education				
No education	20 (5.1)	16 (80)	4 (20)	0.166
Primary not completed	145 (36.6)	96 (66.2)	49 (33.8)	
Primary completed	130 (32.8)	99 (76.2)	31 (23.8)	
High school not completed	52 (13.1)	38 (73.1)	14 (26.9)	
High school completed	29 (7.3)	24 (82.8)	5 (17.2)	
Vocational education	6 (1.5)	5 (83.3)	1 (16.7)	
Tertiary	14 (3.5)	13 (92.9)	1 (7.1)	
Women's occupation				
Farming/cultivating crops	306 (77.3)	227 (74.2)	79 (25.8)	0.465
Employed	39 (9.8)	30 (76.9)	9 (23.1)	
Not employed	51 (12.9)	34 (66.7)	17 (33.3)	
Socio-economic class (Ubudehe)				
First category (lowest)	47 (11.9)	25 (53.2)	22 (46.8)	0.010*

Second category	165 (41.7)	126 (76.4)	39 (23.6)
Third category	181 (45.7)	138 (76.2)	43 (23.8)
Missing	3 (0.8)	2(66.7)	1 (33.3)

Women's gestational and health information	Total N (%)	Not depressed N (%)	Depressive Symptoms N (%)	P-value
Gestational age				
6 months	142 (35.9)	105 (73.9)	37 (26.1)	0.797
7 months	102 (25.8)	78 (76.5)	24 (23.5)	
8 months	106 (26.8)	76 (71.7)	30 (28.3)	
9 months	46 (11.6)	32 (69.6)	14 (30.4)	
Pregnancy intention				
Wanted	296 (74.7)	244 (82.4)	52 (17.6)	0.000*
Unwanted	100 (25.3)	47 (47)	53 (53)	
Planned pregnancy				
Planned	254 (64.1)	213 (83.9)	41 (16.1)	0.000*
Unplanned	142 (35.9)	78 (54.9)	64 (45.1)	
Parity (number of children given birth to)				
0	114 (28.8)	90 (78.9)	24 (21.1)	0.040*
1 to 3	232 (58.6)	171 (73.7)	61 (26.3)	
4 and more	50 (12.6)	30 (60)	20 (40)	
Type of delivery on last pregnancy				
Normal vaginal delivery	199 (50.3)	142 (71.4)	57 (28.6)	0.325
Vaginal delivery with complications	31 (7.8)	20 (64.5)	11 (35.5)	
Caesarean section	53 (13.4)	40 (75.5)	13 (24.5)	
N/A (first pregnancy)	113 (28.5)	89 (78.8)	24 (24.2)	

Mothers' perceived health status				
Poor	73 (18.4)	25 (34.2)	48 (65.8)	0.000*
Neither poor nor good	174 (43.9)	126 (72.4)	48 (27.6)	
Good	149 (37.6)	140 (94)	9 (6)	
Are you currently ill?				
Yes	68 (17.2)	38 (55.9)	30 (44.1)	0.000*
No	328 (82.8)	253 (77.1)	75 (22.9)	
Have you lost a child				
Yes	58 (14.6)	39 (67.2)	19 (32.8)	0.244
No	338 (85.4)	252 (74.6)	86 (25.4)	
Size of the family (number of children taken care of)				
No child	115 (29.1)	90 (78.3)	25 (21.7)	0.16
1-3	231 (58.3)	169 (73.2)	62 (26.8)	
4 and plus	50 (12.6)	32 (64)	18 (36)	
Have you experienced a stressful event (checked off at least 1)				
Yes	123 (31.1)	63 (51.2)	60 (48.8)	0.000
No	273 (68.9)	228 (83.5)	45 (16.5)	
Relationship with husband				
Strong	277 (69.9)	241 (87)	36 (13)	0.000
Poor	119 (30.1)	50 (42)	69 (58)	
Maternal social support				
1. Husband/partner support				
No partner	65 (16.4)	33(50.8)	32 (49.2)	0.000

Poor support	109 (27.5)	50 (45.9)	59 (54.1)	
Good support	289 (72.5)	241 (84)	46 (16)	
2. Friend support				
Poor support	216 (54.5)	137 (63.4)	79 (36.6)	0.000
Good support	180 (45.5)	154 (85.6)	26 (14.4)	

Factors predicting the likelihood of antenatal depressive symptoms in Rwanda

A binary logistic regression adjusted model was performed to assess the impact of factors on the likelihood of elevated antenatal depressive symptoms (EPDS \geq 12). The model contained only those independent variables that were found to have significant bivariate relationships with antenatal depressive symptoms. However, where variables were deemed to be redundant, only one was included to avoid possible multicollinearity. Thus, relationship with husband, being currently ill, and unplanned pregnancy were excluded from the analysis because they were deemed to be very similar (and highly correlated) to husband support, perceived health status, and unwanted pregnancy respectively.

The full model was statistically significant ($p=0.00$). Findings illustrated in Table 2 indicate that parity is strongly associated with antenatal depressive symptoms; women with no child (primigravida) were less likely to have antenatal depressive symptoms than those with 4 or more children (Adjusted Odds Ratio (AOR): 0.336, Confidence interval (C.I.) =0.113–1.000). Pregnancy intention was also a strong predictor of antenatal depressive symptoms; women who reported a wanted pregnancy, were less likely to have antenatal depressive symptoms (AOR: 0.415, CI: 0.221- 0.778). Respondents who reported having had any extremely stressful life events were more likely to have antenatal depressive symptoms (Odds Ratio = 2.300, C.I. = 1.263–4.189) than those who had not (see Table 2). In contrast, socio-economic class did not show any association in the multivariate analysis. As predicted, husband/partner support was found to be a strong predictor of antenatal depressive symptoms; both women with no partner (AOR: 4.458, CI: 1.833- 10.842) and those with poor husband/partner support were more likely to have antenatal depressive symptoms (AOR: 3.366, CI: 1.593- 7.113). Interestingly, in the multivariate analysis, friend support was no longer a significant predictor.

Table 3: Logistic regression predicting the likelihood of antenatal depressive symptoms among women in Southern Province in Rwanda.

Independent variables	Depressive symptoms	B	S.E.	Wald	df	P-values	Odds ratio	95% C.I.	
								Lower	Upper
Ubudehe (wealth class)				2.852	2	0.240			
First	22 (46.8)	0.654	0.439	2.224	1	0.136	1.924	0.814	4.546
Second	39 (23.6)	-0.066	0.316	0.043	1	0.835	0.936	0.504	1.740
Third (r)	43 (23.8)						1.000		
Parity*				4.123	2	0.127			
Primigravida	24 (21.1)	-1.091	0.557	3.845	1	0.050	0.336	0.113	1.000
One child to 3	61 (26.3)	-0.390	0.424	0.849	1	0.357	0.677	0.295	1.553
4 and more (r)	20 (40)						1.000		
Perceived health status*				26.328	2	0.000			
Poor	48 (65.8)	2.414	0.471	26.273	1	0.000	11.176	4.441	28.126
Neither poor nor good	48 (27.6)	1.445	0.416	12.048	1	0.001	4.240	1.876	9.587
Good (r)	9 (6)						1.000		
Pregnancy intention*									
Wanted	52 (17.6)	-0.880	0.321	7.526	1	0.006	0.415	0.221	0.778
Unwanted (r)	53 (53)						1.000		
Stressful life event*									
At least one	60 (48.8)	0.833	0.306	7.414	1	0.006	2.300	1.263	4.189
None (r)	45 (16.5)						1.000		
Maternity social support									
Husband/partner support*				16.738	2	0.000			
No partner	32 (50)	1.495	0.453	10.869	1	0.001	4.458	1.833	10.842
Poor	29 (52.7)	1.214	0.382	10.107	1	0.001	3.366	1.593	7.113
Good	43 (15.7)						1.000		
Friend support									
Poor	79 (36.6)	0.199	0.325	0.376	1	0.540	1.221	0.646	2.307

Good	25 (14.1)						1.000
Constant		-2.253	0.541	17.350	1	0.000	0.105

*: Predictors with a $p < .05$, "r": Reference category, df: degree of freedom, B: Regression coefficients

Discussion

The findings of this study suggest that rates of antenatal depressive symptoms are high in Rwanda with more than one in four pregnant women in this study having scores in the depressive range. This study reveals a high prevalence of antenatal depressive symptoms compared to other African countries such as Malawi (19%) [1], Ethiopia (16%) [24] but similar to the findings of a previous assessment of the pooled prevalence of antenatal depression in Africa overall (26.3%) in a recent 2020 systematic review [5]. A previous community-based study in Rwanda using same EPDS cut-off [18], however that showed lower prevalence.

This research raises important questions about associated factors of mental health in social contexts with limited social and material resources. The results here suggest that women in highly vulnerable environments may be particularly dependent on support available from their immediate social networks, which likely includes both material and social support, and particularly the presence of a good support with their husband/partner. However, socio-demographic factors such as age, education, occupation, family size, and gestational age were not associated with antenatal depression. Similarly, the association of socioeconomic class and friend support with antenatal depressive symptoms was no longer significant once the effects of other factors were controlled. Although sociodemographic factors have been found to be associated with antenatal depression in some previous studies [25, 26], a study by Dibaba and colleagues in Ethiopia also found that sociodemographic factors such as age, family size, economic class, occupation and education were not significant [8].

The impact of poverty might not be associated with antenatal depressive symptoms in the Rwandan context due to the direct support provided to pregnant woman who are identified as being in the two lower classes (1st and 2nd categories) [27]. This kind of support, "Shisha Kibondo flour for mothers," is used to make a highly nutritious porridge for pregnant or breastfeeding women and could have played a protective role by reducing some of the stress of poverty and the known impacts of malnutrition on depression [28]. However, the impact of this kind of support needs to be verified in further studies.

The bivariate analyses showed that pregnant women who live without a partner (single, divorced/separated and widowed) were more susceptible to antenatal depression, consistent with the study by Woldetensay and colleagues [25]. However, the mere presence of a partner is not enough. Lack of support from the husband/partner was found to be important in the development of antenatal depressive symptoms, a finding consistent with previous research in Rwanda [15] and in a study by Faleschini and colleagues [29]. This finding may be related to the impact of having an unwanted or unplanned pregnancy, which has been verified as a risk factor for antenatal depression in Rwanda [15]

and in other African countries such as Ethiopia [30]. Unplanned pregnancy affects partner support [30], and thus could have contributed to poor husband/partner support in this study which was found to predict depressive symptoms among pregnant women. However, even if unwanted pregnancy increases women's risk of depression, increased social support plays a protecting role from depression [11]. Thus, identifying women's pregnancy intention and the extent of social support they receive during antenatal care visits is needed to provide appropriate counseling and improve women's mental health during pregnancy.

Furthermore, the findings of this study, showed that parity was associated with antenatal depressive symptoms, primigravida women (who were expecting for the 1st time) were less likely to have antenatal depressive symptoms than those that have given birth to 4 or more children. To mitigate this risk, expanding family planning services to reduce unplanned pregnancies and giving due attention to the mental wellbeing of pregnant mothers with a history of unwanted/unplanned pregnancy and women who have given birth to 4 or more children would help alleviate the short- and long-term consequences of antenatal depressive symptoms.

Finally, this research also explores the broad range of possible support sources mothers can draw on in the Rwandan context. The relative lack of impact of peer support once other factors are taken into account is not consistent with what has been found in other research, particularly in high income contexts [17]. It will be important to use qualitative research to understand how peer support is provided and experienced in the Rwandan context, in order to identify alternative sources for support those women with poor or missing spousal support.

Conclusion

The high rates of antenatal depressive symptoms among pregnant women attending ANC services indicate that it is imperative to include screening for depression and its attendant risk factors to improve detection and referral for interventions. Integration of mental health service with ANC follow-up service and screening pregnant women for possible depression has paramount importance for a healthy pregnancy and prevention of the possible adverse health outcomes on the mother and the fetus. The importance of spousal support to maternal mental health has been noted elsewhere and reinforces the importance of considering maternal mental health at the level of the family and community, and not only as a factor affecting women alone.

Abbreviations

EPDS: Edinburgh Postnatal depression scale;

Declarations

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Authors' contributions

PMU (University of Rwanda) conducted the research, drafted and revised the manuscript.

DG (University of Rwanda) provided supervision and guidance throughout the process of the research project and completion and revision of the manuscript.

MH (York University) provided guidance throughout the process of the study and completion and revision of the manuscript.

Leatitia Nyirazinyoye (University of Rwanda) provided guidance throughout the process of the study and completion and revision of the manuscript. All authors read and approved the final manuscript.

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Availability of data and materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

Ethical approval from the Institutional Review Board of the College of Medicine and Health Sciences/ University of Rwanda (Certificate: 067/CMHS IRB/2019) was obtained, as well as the written permissions to conduct the study from the management of Muhanga and Kamonyi districts. All participants provided written consent. Participants under the age of 18 (the age of majority in Rwanda), signed assent forms and their parents/guardians provided written consent.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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