

# Perceived Stress and Associated Factors Among Pregnant Women in Western Ethiopia: Community Based Cross-Sectional Study, 2021

Wogene Daro Kabale \*, Gemechu Gelan Bekele, Ephrem Yohannes Roga, Dajane Negesse Gonfa, Amare Tesfaye Yami

Department of Midwifery, College of Medicine and Health Sciences, Ambo University, Ambo, Ethiopia.

\*Corresponding Author: Wogene Daro Kabale, Department of Midwifery, College of Medicine and Health Sciences, Ambo University, Ambo, Ethiopia.

Received date: April 20, 2023; Accepted date: May 19, 2023; Published date: May 30, 2023.

Citation: Wogene D. Kabale, Gemechu G. Bekele, Ephrem Y. Roga, Dajane N. Gonfa, Amare T. Yami, (2023), Perceived Stress and Associated Factors Among Pregnant Women in Western Ethiopia: Community Based Cross-Sectional Study, 2021, *J. Obstetrics Gynecology and Reproductive Sciences*, 7(3) DOI:10.31579/2578-8965/167

Copyright: © 2023, Wogene Daro Kabale. This is an open-access article distributed under the terms of The Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

## Abstract:

**Background:** Ethiopian health care guidelines did not include antenatal perceived stress as a component of routine antenatal care, and this results in under-diagnosis of antenatal perceived stress during routine antenatal care follow-up. As a result, the purpose of this study to assess the prevalence of perceived stress and associated factors among pregnant women in the western Ethiopia.

**Methods:** A community-based cross-sectional study was conducted among 451 pregnant women in West Shewa Zone, Oromia Region, Ethiopia. From September 20, 2021, to October 19, 2021, Pregnant women were recruited using cluster sampling techniques. Data was collected by using a standardized questionnaire that had been pre-tested. The data were entered into Epi data version 4.6 and then exported to SPSS version 26. Bivariate and multivariate logistic regression analyses were used to identify significantly associated factors.

**Result:** The prevalence of perceived stress during pregnancy was 21.2% at 95% CI (20.1,23). Unplanned pregnancies (AOR: 5.43; CI 2.61-10.77), early ANC booking (AOR: 3.02 CI; 1.66-5.48) and obstetric complications during the current and previous pregnancies (AOR: 3.53CI; 1.9- 6.56) were significantly associated with perceived stress.

**Conclusion:** The prevalence of perceived stress during pregnancy was higher, indicating a need to screen perceived stress and its predictors in routine antenatal care. Strengthening the counseling service and increasing access and availability of modern contraceptive methods may reduce the rates of unplanned pregnancies. This, in turn, plays a significant role in alleviating perceived stress in Ethiopia.

**Keywords:** perceived stress; pregnancy; mental health; psychosocial health; west Shewa; ethiopia

## Introduction

Stress is the response of human physiology to a demanding situation [1]. Perceived stress (PS) is the person's perceptions level of stress at a specific moment in time or over a certain length of time in response to problems or difficulties [2]. Perceived stress during pregnancy is inability pregnant women to cope with demands and worries, resulting in the experience of stress that manifests both behaviorally and physiologically [3].

Pregnant women have a positive outlook on their outcomes, but it is a time of increased vulnerability to stress due to changes in hormonal levels [4], and pregnancy-related stressors especially in developing countries because of the high level of stressors like poverty, unwanted pregnancy, high parity, and pregnancy-related complications [5]. Perceived stress is the cause of

morbidity and mortality worldwide. It is one of the most common mental health conditions in the general population, with an estimated prevalence of 35% in the adult population [6].

Women are more stressed and affected by family responsibilities than men; additionally, pregnancy has been identified as a vulnerable period with an increased risk of psychosocial symptoms [7]. Stress is a common part of life, but when it occurs during pregnancy, it can go beyond what is expected and cause problems. High levels of stress during pregnancy may affect the mother's ability to do daily activities, including sleeping, eating, and feeling [8, 9].

According to different literature reports, the prevalence of PS during pregnancy in developed countries ranges from 10%-33.4% [10, 11], while in developing countries, including Ethiopia, it ranges between 11.6-65.4% [1, 12-14]. As of the study conducted in Canada, Arbaminch Town, Iran, Saudi Arabia, Ghana, and Thailand, the prevalence of PS during pregnancy was 12%, 23.1%, 11.5%, 33.4%, 28.6%, and 23.6%, respectively [4, 5, 10, 11, 15, 16].

Stress has a significant impact on the pregnancy's course and outcomes; it also has an impact on maternal, fetal, neonatal, and adolescent wellbeing [17]. Evidence suggests that stress during pregnancy increases the risk of pre-term birth (PTB) [18], alters fetal body mass index (BMI) [19], very low birth weight (VLBW) [20], and pre-term delivery (PTD) [21], lower iron storage at birth, and the likelihood of low plasma ferritin levels at 1 year of age [22], and it also increases the levels of pregnancy-induced hypertension [23], hyperemesis gravidarum [1], and spontaneous abortion [24].

The American college of obstetrics and gynecology (ACOG) 2000 census recommended prenatal screening and intervention for psychosocial risk factors, including stress, for all pregnant women during their ante-natal care (ANC) follow-up [25]. The majority of Ethiopian pregnant women receive prenatal care as recommended by the World Health Organization. However, current prenatal care does not employ screening tools to detect women experiencing high levels of stress or does not assess pregnant mothers' emotional status [25].

To avoid the detrimental effects of stress during pregnancy on both the fetus and the mother, prenatal care providers must screen for and give appropriate care during the antenatal period [18].

Divorce, separation from spouse, physical or psychological trauma from family, multigravida, gestational age of less than 12 weeks, obstetric and medical complications during pregnancy, stressful life events, and family conflict are just a few of the factors that can increase or decrease the perception of stress during pregnancy, which is amplified by hormonal changes [11, 15, 16].

To the investigator's knowledge, there are limited studies conducted in Ethiopia whose results lack consistency and some psychosocial factors like a stressful life event. Furthermore, in the study area, the prevalence and contributing factors of PS among antenatal women were not studied. Therefore, this study assessed the prevalence and associated factors of perceived stress during pregnancy.

## Method

### Study Setting

The study was conducted from September 20 to October 19, 2021, in the West Shewa zone, Oromia regional state, Ethiopia. The West Shewa zone has a total of 23 woredas (districts), including Ambo town, the capital of the zone. The projected population of the West Shewa zone is about 2.8 million (1.4 million men and 1.4 million women). During the study period, there were 26, 7399 pregnant women, of whom 17, 9160 were in the 2nd and 3rd trimesters of pregnancy. One teaching referral hospital, three general hospitals, four basic hospitals, 100 health centers, and 447 health posts make up the zone's health system, which covers 93% of potential health care coverage. The majority of the population is Protestant, with 53.43% stating that they adhered to this creed, while 37.1% practiced Ethiopian Orthodox Christianity, and 8.2% identified as Muslim. A community-based cross-sectional study was conducted in the West Shewa zone.

### Study population

All pregnant women found in the selected district during the study period were included in the study.

### Inclusion criteria and Exclusion criteria

All pregnant women who were permanent residents of the area and that they are willing to participate were included and those with known psychiatric illness and seriously sick women were excluded.

### Sample size determination and procedure

The sample size was determined by using the single population proportion formula by considering the following statistical assumptions: The prevalence of PS among pregnant women attending ANC at the governmental health institution in Arba Minch town was 23.1% (15). A cluster sampling technique was employed to select three woredas, such as Toke Kutaye, Ambo, and Bako out of 23 woredas. Health extension workers of each woreda listed pregnant mothers using the non-identifying registration code. We have used this registration as a sampling frame to recruit the study participants. Finally, a total of 451 pregnant mothers who were in the second or third trimester of pregnancy were employed in the study by using a systematic random sampling. The value of "K" was calculated by using the list of pregnant women obtained from the registration book of health extension workers from respective woredas. Then for K for Toke Kutaye Woreda, there were 3590 registered women ( $K = 3590/451 = 7.960$ ); for K for Ambo woreda, there were 3401 registered women ( $K = 3401/451 = 7.54$ ); and for K for Bako woreda, there were 3551 registered women ( $K = 7.87$ ). Hence, the sample interval was 7.9, 7.5, and 7.8 for each woreda, which approximated to 8. Therefore, individuals were chosen at regular intervals (every eight), and the first study participant was selected by lottery from the one to eight and three were selected randomly.

### Data Collection tool and procedure

The data was collected using a structured and pre-tested questionnaire. To ensure consistency, the questionnaire was translated from English to Afaan Oromo and then back from Afaan Oromo to English. The data was collected using an Afaan Oromo version of the questionnaire. The data gathering method was a face-to-face interview. For data collection, six bachelor's degrees in nursing psychiatry students were selected. A questionnaire took an average of 20-30 minutes to complete. The mothers were informed of all aspects of the study by the interviewers. The women were urged to be themselves and advised that their responses would be kept private and that no information would be shared with anyone other than the investigator. Following that, a woman who agreed to participate and completed the informed permission form was interviewed in a calm and comfortable environment. The data collection process was overseen and double-checked for accuracy and completeness. The supervisor and primary investigator examined and cross-checked questionnaires for completeness, accuracy, and consistency after each day.

### The interview consists:

**Demographic characteristics:** demographic data, which provided baseline information, was obtained from the participants, including age, ethnicity, religion, education, occupation, marital status, wealth index, and residency.

**Obstetrics and gynecological characteristics:** information such as gestational age, parity, gravidity, abortion experience, type of pregnancy, and other comorbid illnesses such as pregnancy-related hypertension, gestational diabetes mellitus, ANC counselling, and other illnesses was obtained from participants.

**Perceived stress:** The 10-item Likert-type Perceived Stress Scale (PSS) was used to assess perceived stress caused by perceptions of difficulty in controlling or coping with life events in the previous month. Responses are rated on a 5-point scale from 0 (never) to 4 (very often). Some of PSS scores are obtained by reversing responses (eg, 0=4, 1=3, 2=2, 3=1 and 4=0) to the four positively stated items (items 4, 5, 7 and 8) and then summed across all scale items. Scores range from 0 to 40, with cutoff point 21 and higher scores indicating perceived higher stress [11].

**Social support:** It was measured by a 6-item, self-reported, 5-point Likert scale. The total score ranged from 1 to 30. The score was summed and

classified as having high maternal social support (for scores 24–30), medium social support (18–23), and low social support (<17) [15].

**Intimate partner violence:** consists of five questions to determine the status of intimate partner violence. The questionnaire was developed from a WHO multi-country study on violence against women, and if any questions on the screen were answered yes, the participant was considered positive for abuse [26].

**Stressful life event:** measured by 13-item questions, the woman was asked to indicate whether she had personally experienced any serious life events in the last six months, and she was considered to have experienced a stressful life event if she answered yes to any one of the questions [27].

### Data Quality Controls

The structured questionnaire was pre-tested on 5% of pregnant women at Oromia's Adeya Berga Woreda. Additionally, the principal investigator provided data collectors with a two-day training to raise awareness about the data that would be collected, the importance of timely collection, and data management, as well as the basic technique of data collection, approaches, and the issue of confidentiality and privacy. The study participants were given a thorough description of the study's goal and method to get informed consent and trustworthy data. Furthermore, supervisors monitored the data collectors daily. The supervisors and primary investigator verified the completed questionnaire for completeness and consistency daily. Finally, the completed questionnaire was double-checked to confirm that all data had been correctly obtained and recorded

## Methods of Data Analysis

Data were coded and entered into Epidata Version 4.6 before being exported and analyzed in SPSS Version 26. The binary logistic regression employed to find characteristics linked to the perceived stress during pregnancy. In a multivariate logistic regression model, variables with  $P < 0.25$  in bivariate analysis were entered. Before analyzing the data, it was cleaned up and cross-checked. Statistical approaches were used for both descriptive and analytical purposes. Tables and figures were also employed to present the data. The Hosmer Lemeshow goodness of fit test was used to verify the final model. To reduce bias, cofounders, interaction, and multi-collinearity were checked.

## Results

### Socio-demographic characteristics of the study participants

Out of the total 451 pregnant women planned for the study, 438 were enrolled in the study making a response rate of 97.1%. The mean ( $\pm$  standard deviation) of the respondent's age was 26.92( $\pm$ 5.13), with a range of 15\_40 years. Two hundred and sixty-seven of the study participants (60.6%) were in the age group of 20-29 years. Four hundred and thirty-one of the respondents (98.4%) were married and 363(82.9%) housewives in occupation. Half of the pregnant women 225(56.9%) attended primary school. Regarding the occupation of husbands 345(78.8%) were farmers and 258(58.9%) attended primary school. Almost all 431(98.4 %) pregnant women were living with their husbands and 176(40.2%) of the respondents were grouped under moderate wealth quintiles (Table 1).

Variable	Category	Frequency	Percentage
<b>Age</b>	<19	38	8.7
	20-24	110	25.1
	25-29	157	35.8
	30-34	96	21.9
	>35	37	8.5
<b>Education of mother</b>	Can't read and write	55	12.5
	Can read and write	134	30.6
	Primary school	225	51.4
	Secondary school and above	24	5.5
<b>Occupation of mother</b>	Housewife	363	82.9
	Merchant	54	12.3
	Other*	21	4.8
<b>Marital status</b>	Married	431	98.4
	Cohabitant	7	1.6
<b>Partner education</b>	Can't read and write	47	10.7
	Can read and write	101	23.1
	Primary school	258	58.9
	Secondary school and above	32	7.3
<b>Partner occupation</b>	Farmer	345	78.8
	Merchant	68	15.5
	Government employed	9	2.0
	Other**	16	3.7
<b>Living arrangement</b>	With husband	431	98.4
	Alone	7	1.6
<b>Wealth index</b>	Very poor	41	9.4
	Poor	120	27.4
	Medium	176	40.2
	Rich	22	5.0
	Very rich	79	18.0

NB\*government employed/student/daily laborer, \*\*- student/daily laborer/private employed

**Table 1:** Sociodemographic characteristics of perceived stress among pregnant women in West Shewa, Oromia regional state, Ethiopia. 2021(n=451)

### Obstetric characteristics of the respondents

Of the total study participants, 323(73.7%) were multigravida and 389(88.8%) of the current pregnancy were planned. Two hundred and

seventy-four (62.6%) of the study participants were in their second trimester of pregnancy. At the time of the interview, three hundred and seventy-nine participants (86.5%) had antenatal care for this pregnancy. Among those pregnant women who attended ANC, 143(32.6%) had visited one time and

for 361(82.4%) pregnant women counseling was provided. Regarding their timing for ANC, one hundred twenty-one (27.6%) respondents visited health facilities for the first ANC follow-up before or at 16 weeks of gestational age. Twenty and eight (6.4%) of the respondents had a history of abortion,

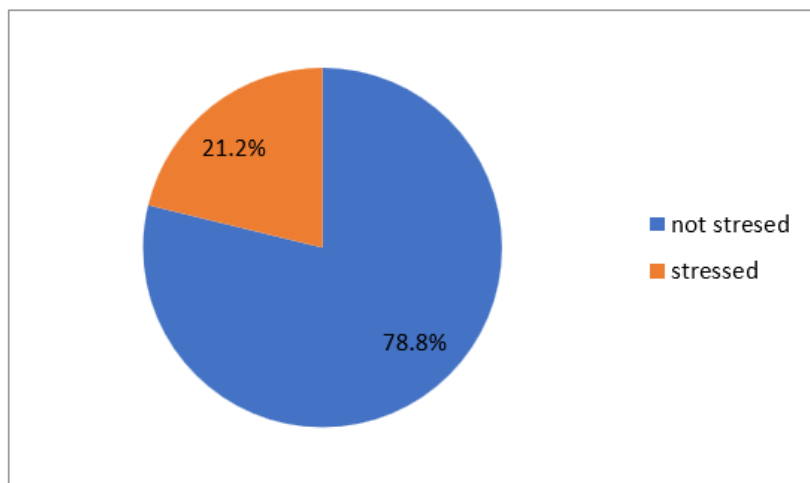
and 8(1.8%) had a history of multiple gestations. During the current and previous pregnancies, 374(85.4%) of pregnant women did not face obstetric complications. Four and twenty-nine (97.9%) of pregnant women had no history of chronic medical illnesses (Table 2).

Variable	Categories	Frequency	Percentage
Gravidity	Prim-gravida	87	19.9
	Multi-gravid	323	73.7
	Grand multi-gravid	28	6.4
Parity	Nulli-parious	94	21.5
	Primi-parious	103	23.5
	Multi-parious	241	55.0
Pregnancy status	Planned	389	88.8
	Unplanned	49	11.2
Gestational age	First trimester	19	4.3
	Second trimester	274	62.6
	Third trimester	145	33.1
Antenatal care follows up	Yes	379	86.5
	No	59	13.5
Number of Antenatal cares follow up	One time	143	37.7
	Two times	133	35.1
	Three times	80	21.1
	Four and above times	23	6.1
Counseling during pregnancy	Yes	361	95.3
	No	18	4.7
Antenatal care initiation	Had no Antenatal care follow up	59	13.5
	Before 16 weeks of Gestation	121	27.6
	After 16 weeks of gestation	258	58.9
Abortion history	No	410	93.6
	Yes	28	6.4
Multiple gestation	Yes	8	1.8
	No	430	98.2
Obstetric complication	Yes	64	14.6
	No	374	85.4
Chronic medical illness	Yes	9	2.1
	No	429	97.9

**Table 2:** Obstetric characteristics of pregnant women in West Shewa, Oromia regional state, Ethiopia, 2021, (n=451)

**Perceived stress during pregnancy**

Among 438 study participants, the prevalence of perceived stress was 21.2% with a range of 20.1-23 at 95% CI (Figure 1).



**Figure 1:** Prevalence of perceived stress among pregnant women in West Shewa, Oromia regional state, Ethiopia, 2021(n=451)

**Factors associated with perceived stress during pregnancy**

In the bivariate analysis, the gravidity of the women, the status of pregnancy, time of ANC initiation, having previous and current obstetric complications during pregnancy, having concern towards partner worries, abuse during pregnancy, and experiencing stressful life events in the last six months were variables that had a p-value less than 0.25.

In the multivariate analysis status of pregnancy, time of ANC initiation, and having previous and current obstetric complications were associated with perceived stress among pregnant women in West Shewa Zone at a p-value of < 0.05 (Table 3).

Variables	Categories	Perceived stress		COR 95% CI	AOR 95% CI	P value
		Yes	No			
Pregnancy status	Planned	68	321	1	1	<0.0001
	Unplanned	25	24	4.92(2.65-9.12)	5.39(2.66-10.92)	
Gravidity	Primigravida	11	76	0.31(0.11-0.84)	0.58(0.18-1.86)	0.36
	Multigravida	73	250	0.62(0.28-1.42)	0.82(0.32-2.16)	0.69
	Grand multigravida	9	19	1	1	1
Time of antenatal care initiation	No ANC follow up	9	50	0.98(0.45-2.15)	0.9(0.38-2.13)	0.81
	Up to 16 weeks of gestation	44	77	3.11(1.89-5.14)	3.14(1.8-5.48)	<0.0001
	After 17 weeks of gestation	40	218	1	1	1
Obstetric complication	Yes	29	35	4.01(2.29-7.03)	3.22(1.73- 6.01)	<0.0001
	No	64	310	1	1	1
Husband worry	Yes	21	56	1.51(0.86-2.65)	1.17(0.6-2.29)	0.65
	No	72	289	1	1	
Abuse during pregnancy	Yes	33	68	2.24(1.36-3.7)	1.65(0.93-2.95)	0.09
	No	60	277	1	1	
Stressful life event	Yes	21	51	1.68(0.95-2.97)	1.68(0.87-3.22)	0.12
	No	72	294	1	1	

**Table 3:** Bi-variable and multivariable logistic regression model for factors associated with perceived stress during pregnancy in West Shewa, Oromia regional state, Ethiopia, 2021(=451).

It was observed that mothers who had unplanned pregnancies were 5.39 times more likely to have had perceived stress as compared to mothers who did not have unplanned pregnancies (AOR=5.39; 95%CI: 2.66, 10.92).

After adjusting other variables odds of developing perceived stress were 3.14 times higher among pregnant women who initiate their antenatal care follow-up before or at sixteen weeks as compared to those initiated after sixteen weeks of gestation (AOR=3.14; 95%CI: 1.8, 5.48).

In addition, the odds of having perceived stress among pregnant women who ever had obstetric complications during pregnancies were 3.22 times higher than those women who did not have obstetric complications (AOR=3.22; 95%CI: 1.73, 6.01).

## Discussion

The current study indicated that the prevalence of perceived stress among pregnant mothers was found to be 21.2% 95% CI (20.1,23). The multivariate logistic regression identified unplanned pregnancies, early ANC booking, and obstetric complications during the current and previous pregnancies as factors significantly associated with PS.

Based on our study results, the prevalence of perceived stress among pregnant women in West Shewa was 21.2% 95% CI (20.1,23). This finding is similar to studies conducted in Arba Minch town 23.1% [14] and urban Thailand at 23.6% [11]. Whereas this study finding was higher as compared to the studies reported in Bale Zone Hospitals at 11.6% [1]. The possible reason for the difference might be due to the difference in educational level. In this study, participants had lower educational attainment which is mostly associated with fewer job opportunities and lower income which may influence and limit resources in their daily lives leading to perceived stress. In contrast, education might increase knowledge on how to live a healthy life and it also improves management strategies of stress during pregnancy. It is also higher as compared to studies in Ardabil Iran 7.33% [28], Iran 1.5% [5], Canada 12% [16], the difference might be due to differences in geographical location, socioeconomic status, and sample size.

In contrast, this study's findings were lower as compared to the study conducted in Nepal 34% [29], Ghana 28.6% [4], South India 65.4% [12], Nigeria 46.7% [14], Pakistan 42.2% [13], and Saudi Arabia 33.4% [10], the discrepancy might be due to difference in sample size especially studies

conducted in South India, Nigeria and Ghana, 156, 120 and 160 pregnant women participated in the study respectively. Other plausible explanations include regional variances, cultural practices, and different research participants (differences in the population studied). Only prim-gravida women were included in research conducted in Nigeria, which is substantially influenced by high perceived stress, as corroborated by studies conducted in Northern Ireland and Bangladesh. Another issue might be the various assessment instruments employed to detect perceived stress, particularly in Nepalese research. The method employed to evaluate perceived stress was a general health inquiry, which differed significantly from existing perceived stress assessments.

According to the current study, perceived stress during pregnancy was higher in women who had unplanned pregnancies than in mothers who had planned pregnancies. This study was supported by the studies done in Arba Minch town [15], South India [12], China [24], Pakistan [13], and Canada [16]. This might be due to the nature of pregnancy that needs financial, psychological, and behavioral preparation to accept the pregnancy and the coming new family member regardless of the areas that they are living in and due to the inability of pregnant women to cope with the economical demand of pregnancy, motherhood and raising child. It might also be due to the social unacceptability of pregnant women especially those women who have had many children.

Pregnant women who initiate their ANC follow-up before or at sixteen weeks of gestation were highly stressed than those pregnant women who have had ANC after sixteen weeks of gestation. This finding is consistent with the study conducted in Arba Minch town [15]. This might be due to different physical and physiological changes in the early gestational ages of pregnancy. Another reason might also be due to pregnant women worrying about the viability of the fetus, the probability of abortion, and the increased prevalence of minor pregnancy compliant during her early period of pregnancy which increases the level of stress that leads to early ANC booking. On the other hand, this finding is in contrary to the study done in China stating that late initiation of ANC was highly associated with perceived stress. The discrepancy might be due to the pregnancy being problem free during that period and also due to lack of knowledge about the important of early antenatal care booking.

In addition, pregnant women who ever had obstetric complications were highly stressed than those women not having obstetric complications. The study was in congress with the study report of Canada [16]. This might be due to the higher recurrence rate of obstetric complications that happened previously. The other reason might be the complication that happened might have an adverse effect on the mother as well as the birth outcome that significantly increases the perceived stress level.

The outcome variable of perceived stress among pregnant women has been assessed using the validated, highly sensitive, and specifically sensitive perceived stress scale.

Because of the cross-sectional study's design, it was difficult to report the temporal cause-and-effect relationship between perceived stress and the contributing factors.

Participants with a lower perceived stress may be less motivated to remember (recall bias) earlier exposure than those with a moderate or high perceived stress.

The findings of this study are useful for understanding the prevalence of perceived stress among pregnant women, for identifying significant factors that raise stress levels, for raising public awareness, and for informing stakeholders' actions on those that may be modified. Furthermore, it can inform healthcare professionals about the importance of perceived stress screening and provide effective counseling and treatment programs to pregnant women who visit antenatal care. It will also be a resource for other scholars looking to share important information.

## Conclusion

The prevalence of perceived stress during pregnancy in Ethiopia is high. Being unplanned pregnancy, early initiation of antenatal care follow-up, and obstetric complications during the current and previous pregnancy are the main predictors of perceived stress during pregnancy.

Screening of perceived stress during antenatal care follow was one of the recommendations of the American college of obstetrics and gynecology and based on our result we recommended that for West Shewa health office by collaborating with other regional health offices and other stakeholder should organize conferences to create awareness on perceived stress, the importance, and benefit of early ANC booking as well as family planning to the community in order to avert the level of high perceived stress. For researchers to conduct further research through the qualitative method and other research designs having a longer period.

## Ethical approval and consent to participate

Hawassa University, College of Health and Medical Sciences, Institutional Review Board provided ethical clearance (IRB) with Ref.No: IRB/279/13. Hawassa University wrote to West Shewa Zone letter requesting permission and help. Permission was also obtained from the administrators of each Woredas(districts). The purpose of the study and their ability to decline was explained to all study participants. Before the distribution of the questionnaires, all study participants gave their informed, written, and signed consent. The respondents were assured that the information acquired from them would be kept confidential.

**Data Sharing Statement:** The datasets used or analyzed during the current study are available from the corresponding author upon request.

## Funding

This research did not receive any grant from any funding agencies in the public, commercial or not-for-profit sectors.

## Consent for publication

Not applicable

## Conflicts of interest

The authors declare that they have no potential conflict of interest.

## Acknowledgment

We are grateful to Hawassa University, College of Medicine and Health Sciences for enabling us to conduct this study. The West Shewa zonal Health Office, study participants, data collectors, and supervisors have all been tremendously helpful.

## Author's Contributions

WDK was involved in the project's conception and design. EYR assisted with data curation, and supervision, ATY engaged in investigation, and project administration, and WDK participated in writing up, review & editing the manuscript. All authors participated in funding acquisition, resource mobilization, and validation. WDK and GGB were involved in methodology, and software, and handled data analysis, interpretation, and writing the original draft. In addition, DNG contributed to the visualization. All of the authors agreed to submit to the current journal and gave final approval of the published version; they also solely agreed.

## Abbreviations

**ANC** (Antenatal Care)

**ACOG** (American College of Obstetrics and Gynecology)

**AOR** (Adjusted Odd Ratio)

**BMI** (Body Mass Index)

**CI** (Confidence Interval)

**COR** (Crude Odd Ratio)

**PS** (Perceived Stress)

**PTB** (PreTerm Birth)

**PTD** (PreTerm Delivery)

**VLBW** (Very Low Birth Weight)

## References

- Engidaw NA, Mekonnen AG, Amogne FK. (2019). Perceived stress and its associated factors among pregnant women in Bale zone Hospitals, Southeast Ethiopia: a cross-sectional study. *BMC Res Notes*. 12(1):356.
- Phillips AC. (2016). Perceived stress. *Encyclopedia of behavioral medicine: Springer*; p. 1.
- Ruiz RJ, Fullerton JT. (1999). The measurement of stress in pregnancy. *Nurs Health Sci*. 1(1):19-25.
- Boakye-Yiadom A, Shittu S, Dutt J, Dapare P, Alhassan A. (2015). Perceived stress and anxiety among Ghanaian pregnant women. *Journal of Medical and Biomedical Sciences*. 4(2):29-37.
- Iranzad I, Bani S, Hasanpour S, Mohammadalizadeh S, Mirghafourvand M. (2014). Perceived Social Support and Stress among Pregnant Women at Health Centers of Iran- Tabriz. *J Caring Sci*. 3(4):287-295.
- Cristóbal-Narváez P, Haro JM, Koyanagi A. (2020). Perceived stress and depression in 45 low-and middle-income countries. *Journal of affective disorders*. 274:799-805.
- Herrero SG, Saldaña M, Rodriguez JG, Ritzel DO. (2012). Influence of task demands on occupational stress: gender differences. *J Safety Res*. 43(5-6):365-374.
- Afulani PA, Onger L, Kinyua J, Temmerman M, Mendes WB, et al. (2021). Psychological and physiological stress and burnout among maternity providers in a rural county in Kenya: individual and situational predictors. *BMC public health*. 21(1):1-16.

9. Hou Q, Li S, Jiang C, Huang Y, Huang L, et al. (2018). The associations between maternal lifestyles and antenatal stress and anxiety in Chinese pregnant women: A cross-sectional study. *Scientific reports*. 8(1):1-9.
10. Ahmed AE, Albalawi AN, Alshehri AA, AlBlaihed RM, Alsalamah MA. (2017). Stress and its predictors in pregnant women: a study in Saudi Arabia. *Psychol Res Behav Manag*. 10:97-102.
11. Thongsomboon W, Kaewkiattikun K, Kerdcharoen N. (2020). Perceived Stress and Associated Factors Among Pregnant Women Attending Antenatal Care in Urban Thailand. *Psychol Res Behav Manag*. 13:1115-1122.
12. Vijayaselvi R, Beck MM, Abraham A, Kurian S, Regi A, et al. (2015). Risk Factors for Stress During Antenatal Period Among Pregnant Women in Tertiary Care Hospital of Southern India. *J Clin Diagn Res*. 9(10): Qc01-5.
13. Waqas A, Zubair M, Zia S, Meraj H, Aedma KK, et al. (2020). Psychosocial predictors of antenatal stress in Pakistan: perspectives from a developing country. *BMC Res Notes*. 13(1):160.
14. Yarube I, Sani L, Saleh M, Alhassan A. (2018). Assessment of perceived stress amongst primigravidae attending an ante natal clinic in Kano, Nigeria. *Journal of African Association of Physiological Sciences*. 6(1):46-51.
15. Bane AD, Madebo WE, Endashaw G, Bezabih WA, Workie KB, et al. (2020). Assessment of perceived stress and associated factors among pregnant women attending antenatal care at Arba Minch town governmental health institutions, southern Ethiopia.
16. Kingston D, Heaman M, Fell D, Dzakupasu S, Chalmers B. (2012). Factors associated with perceived stress and stressful life events in pregnant women: findings from the Canadian Maternity Experiences Survey. *Matern Child Health J*. 16(1):158-168.
17. Lima SAM, El Dib RP, Rodrigues MRK, Ferraz GAR, Molina AC, et al. (2018). Is the risk of low birth weight or preterm labor greater when maternal stress is experienced during pregnancy? A systematic review and meta-analysis of cohort studies. *PLOS ONE*. 13(7): e0200594.
18. Staneva A, Bogossian F, Pritchard M, Wittkowski A. (2015). The effects of maternal depression, anxiety, and perceived stress during pregnancy on preterm birth: A systematic review. *Women Birth*. 2015;28(3):179-193.
19. Leppert B, Junge KM, Röder S, Borte M, Stangl GI, et al. (2018). Early maternal perceived stress and children's BMI: longitudinal impact and influencing factors. *BMC Public Health*. 18(1):1211.
20. Sable MR, Wilkinson DS. (2000). Impact of perceived stress, major life events and pregnancy attitudes on low birth weight. *Fam Plann Perspect*. 32(6):288-294.
21. Walsh K, McCormack CA, Webster R, Pinto A, Lee S, et al. (2019). Maternal prenatal stress phenotypes associate with fetal neurodevelopment and birth outcomes. *Proc Natl Acad Sci U S A*. 116(48):23996-24005.
22. Rendina DN, Blohowiak SE, Coe CL, Kling PJ. (2018). Maternal Perceived Stress during Pregnancy Increases Risk for Low Neonatal Iron at Delivery and Depletion of Storage Iron at One Year. *J Pediatr*. 200:166-173. e2.
23. Monk C, Webster RS, McNeil RB, Parker CB, Catov JM, et al. (2020). Associations of perceived prenatal stress and adverse pregnancy outcomes with perceived stress years after delivery. *Arch Women's Ment Health*. 23(3):361-369.
24. Qu F, Wu Y, Zhu YH, Barry J, Ding T, et al. (2017). The association between psychological stress and miscarriage: A systematic review and meta-analysis. *Sci Rep*. 7(1):1731.
25. Lapp T. (2000). ACOG addresses psychosocial screening in pregnant women. *American family physician*. 62(12):2701-2702.
26. Biresaw MS, Takelle GM, Gebeyehu ET. (2022). Perceived stress and associated factors among pregnant women during COVID-19 pandemic period in Northwest Ethiopia, 2020: a cross-sectional study. *BMJ open*. 12(9): e063041.
27. Goodman LA, Corcoran C, Turner K, Yuan N, Green BL. Stressful Life Events Screening Questionnaire.
28. Mohammadpour M, Charandabi SM-A, Malekutei J, Mohammadi M, Mirgha fourvand M. (2019). Perceived stress and its relationship with social support in pregnant women referring to health centers of Ardabil, Iran. *Crescent Journal of Medicine and Biology*. 6(4):505-510.
29. Pantha e, Hayes B, Yadav B, Sharma P, Shrestha A, et al. (2014). Prevalence of Stress among Pregnant Women Attending Antenatal Care in a Tertiary Maternity Hospital in Kathmandu. *Journal of women's health care*. 3:1-6.



This work is licensed under Creative Commons Attribution 4.0 License

To Submit Your Article, Click Here:

**[Submit Manuscript](#)**

**DOI:10.31579/2578-8965/167**

**Ready to submit your research? Choose Auctores and benefit from:**

- fast, convenient online submission
- rigorous peer review by experienced research in your field
- rapid publication on acceptance
- authors retain copyrights
- unique DOI for all articles
- immediate, unrestricted online access

At Auctores, research is always in progress.

Learn more <https://www.auctoresonline.org/journals/obstetrics-gynecology-and-reproductive-sciences>