Assessment of Perceived Stress and Associated Factors among Pregnant Women Attending Antenatal Care at Arba Minch Town, Ethiopia, 2020

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ABSTRACT

Background*: Perceived stress is a real or apparent inconsistency between environmental demands required for survival and an individual's capacity to adjust to these requirements. Worldwide stress is a very common problem. Females are at increased risk to develop perceived stress in antepartum period. Stress during pregnancy has serious effects for both the mother and newborn. However this problem doesn't get adequate attention in Ethiopia.*

Methods*: Institution based cross-sectional study was employed. Data were collected using structured pretested questionnaire from 460 mothers by using systematic sampling technique. Descriptive statistics and binary logistic regression was used. In bivariable analysis variables with P value <0.25 were transferred to final model. Both crude and adjusted odd ratio with 95% confidence interval were used to report strength of association and statistical significance declared at p-value < 0.05 in multivariable analysis.*

Results*: The magnitude of perceived stress during pregnancy was 23.1% (95% CI; 19.16-26.96%). Multigravida (AOR= 3.95, 95% CI; 1.94 – 8.02), antenatal care initiation <16 weeks of gestation (AOR= 2.05, 95% CI; 1.18 – 3.57), first trimester (AOR= 3.03, 95% CI; 1.34 – 6.85) and unplanned pregnancy (AOR= 4.32, 95% CI; 2.55 – 7.31) were associated factors of perceived stress during pregnancy.*

Conclusion*: The findings showed that the magnitude of perceived stress during pregnancy is high. Appropriate measures should be taken to improve multigravida women emotional level and pregnant women should be encouraged to initiate ANC early. Special attention should be given to women in 1st trimester and with unplanned pregnancy.*

Key words: Antenatal care, Ethiopia, perceived stress, pregnant women

BACKGROUND

Stress is an actual or perceived disparity between environmental demands required for existence and an individual's capacity to adapt to these desires (Fink, 2010). Perceived stress during pregnancy is defined as the disparity that a gravid lady feels when she cannot deal with demands and worries (Ruiz & Fullerton, 1999). Pregnancy is a stressful period that may provoke mental illness and low level of perceived stress is good for development of the fetus. But if it goes beyond it may change the development of fetal nervous system (Gul et al., 2017).

Stress during pregnancy is a very common problem with nearly three-quarters of women reported they had experienced at least one stressful event before the delivery of their child (Mental Health Foundation, 2018).

Maternal stress can lead to increased rates of infant mortality, low birth weight and preterm birth, which may have long term negative consequences for health and development of the child (Hobel CJ, Goldstein A, Barrett ES, 2008). Studies have shown that women experiencing high stress are 1.5 to 3 times more likely to experience preterm delivery than less stressed women (Susan Cha & Saba W. Masho, 2013). In order to prevent the adverse outcome of stress during pregnancy for both the mother and fetus it is necessary to screen and provide appropriate support during antenatal period by nurses, midwives, obstetricians and mental health specialists (Staneva et al., 2015). Even though majority of pregnant woman's attend antenatal care which is recommended by World Health Organization; current antenatal care is ill-equipped to identify women suffering from high levels of stress or it does not assess emotional status of pregnant mothers (Lynn et al., 2011). Ethiopian antenatal care guideline does not assess the emotional status of the pregnant mothers (Engidaw et al., 2019).

The study conducted in Ethiopia, Bale zone from November 2016 to April 2017 shows that; among 386 pregnant mothers enrolled in the study the prevalence of perceived stress was 11.6% (Engidaw et al., 2019).

Multiple investigations indicate that multigravida mothers are highly considered to have perceived stress when compared with primigravida mothers (Engidaw et al., 2019; Pais & Pai, 2018). In opposite studies conducted in Northern Ireland and Bangalore shows that multigravidas had low prenatal stress and primigravida have significant association with perceived stress during pregnancy (Lynn et al., 2011; S et al., 2018). Perceived stress is also high among mothers who initiate antenatal care after 16 weeks of gestation (Lau & Yin, 2011). The study conducted

in Ethiopia indicates that gestational age less than twelve weeks or first trimester is positively associated with perceived stress during pregnancy (Engidaw et al., 2019). Studies conducted in different parts of the world show that unplanned pregnancy is significantly associated with perceived stress during pregnancy (Lau & Yin, 2011; Vijayaselvi et al., 2015).

During antenatal care follow up pregnant mothers are not scanned to diagnose stress and due to this fact it's difficult to identify which women are stressed (Pais & Pai, 2018). A previous study done in Ethiopia among pregnant mothers lacks important variables. Those missed variables include psychosocial variables like social support, sexual abuse, women concern about husband, family support, husband financial and emotional support. Additionally the prevalence and contributing factors of perceived stress which is representative of all women of the antenatal period is not studied specifically in study area. Therefore, the objective of this study was to assess perceived stress and associated factors among pregnant woman attending ANC at Arba Minch town public health institutions, 2020.

MATERIALS AND METHODS

Study area

The study was conducted at Arba Minch town. Arba Minch town is the capital of Gamo zone, which is 435 km from Addis Ababa and about 275 Km from Hawassa. The town has a total population of more than 200,373, of which 50.2% are females and 23.5% were in reproductive age group. Among those pregnant women were 4084 ("Arba Minch," n.d.). In the town of Arba Minch, there was one public general hospital, two health centers, eleven health posts, thirty three private clinics, and thirteen drug stores.

Study design and period: Institution based cross-sectional study was conducted from March 16 to April 23, 2020.

Source population: All pregnant women who visited antenatal care unit at Arba Minch town health institutions were considered as a source population.

Study population: All pregnant mothers who visited antenatal care unit at Arba Minch town governmental health institutions during the study period were considered as a study population.

Inclusion and exclusion criteria

Inclusion Criteria: All pregnant women visited Arba Minch town governmental health institutions for ANC services during the study period were included in the study.

Exclusion Criteria: Pregnant mothers with known severe mental illnesses were excluded from the study.

Sample size and sampling procedure

Sample size was determined using single population proportion formula based on assumptions of 95% confidence level, 11.6% proportion of perceived stress (Engidaw et al., 2019), 3% marginal error and a 5% contingency.

$N= (Z\alpha/2)^2 P (1 –P)/d^2$ $N= (1.96)^2 0.116*(1-0.116) /0.0009$

N= 437.74 ~ 438, after adding 5% contingency total sample size was 461.

One hospital and two health centers are found in the town. A total of 791 pregnant women comes to those institutions per month for antenatal care. Based on proportional allocation sample size was allocated for each health facility. Skip interval was determined for each facility by dividing the estimated population by the respective sample size (i.e. Kth = N / n). Hence, each participant was selected by systematic sampling with skip interval of 2 at each institution. Using lottery method, 1 was selected and used as a starting number based on their arrival order. Subsequently, every other mother was included until the desired sample size was achieved.

Operational definition

Perceived stress: Perceived stress is the imbalance that a pregnant woman feels when she cannot cope with demands, which is expressed both behaviorally and physiologically. Perceived stress scale is scored by summing across all scale items. The total score ranges from 0.0–21.0 with higher scores indicating women with more perceived stress symptoms. The cutoff value for the stress limit was set at 15 (Cohen et al., 1994; Engidaw et al., 2019; Mekonnen et al., 2018).

Social support: Social support is the accessible support for a pregnant woman through social relationships with other people, groups, and the larger community. Social support was classified into three categories; high social support (for scores 24–30), medium social support (18–23) and low social support (below 18) (Webster et al., 2000).

Data collection procedures and instruments used

Data were collected by face to face interview by 3 female BSc midwives. Structured questionnaire was used to collect the data. It has five sections like socio-demographic variables,

obstetric variables, maternal social support questions, perceived stress scale questions and psychosocial variable. Perceived stress was measured with the perceived stress scale (PSS). PSS is a 7-item multiple-choice self-report psychological instrument for measuring the perception of stress. Each answer is scored 0 to 3 (Cohen et al., 1994). Perceived stress scale is an instrument used to measure perception of stress. The Cronbach's α for this instrument is between 0.84 and 0.86, and the Cronbach's α of this study was 0.89. Social support was measured using Maternity Social Support Scale (MSSS) (Webster et al., 2000). Obstetric and psychosocial variables was developed from different literatures (Engidaw et al., 2019; Vijayaselvi et al., 2015). English version of the questionnaire was translated to Amharic language by an expert. Finally, it was back translated to English language to check for consistency.

Data quality control: To maintain data quality and make further adjustment the questioner was pretested in Lante health center on 23 (5%) pregnant mothers. Supervision was conducted by the supervisor and the principal investigator and on spot questionnaire was checked for completeness and further edition. Sudden observation of how data collectors administer the questions to the respondents was made. Each data collector checks the questionnaires for completeness before winding up their visit to each study participant. Data cleaning was made before an actual analysis.

Data processing and analysis: The pre coded responses were entered into Epi data version 3.1 software and then it was exported to SPSS version 25 for statistical analysis. The perceived stress and social support questions were computed using likert scale. The descriptive data were presented using frequency, tables, figures, mean and standard deviation. A binary logistic regression was used to identify the association of the independent variables with the dependent variable. Each variable which have p-value less than 0.25 was added to the final model to control the confounders. COR and AOR with 95% CI was used to measure the strength of associations and a p-value of < 0.05 was used to determine presence of association with outcome variable. Hosmer and Lameshow goodness of fit test was conducted to test the model fitness and the model was adequate ($p=0.876$). Multicollinearity was checked by using VIF and it was < 10.

Ethical consideration: Ethical clearance was obtained from Institutional Research Ethics Review Board (IRB) of College of Medicine and Health Sciences, Arba Minch University with reference number of IRB/177/12.

RESULTS

Socio-demographic Characteristics

A total of 451 pregnant mothers were participated in this study giving a response rate of 98.04%. The mean (mean ± SD) age of the respondents was 27 ± 8 years. Among the total participants, 186 (41.2%) of mothers attended secondary school and above. About 205 (45.5%) of the women were protestant in religion. Nearly half of the mothers 220 (48.8%) were Gamo in ethnicity and 407 (90.24%) of the mothers were married. (Table 1).

Table 1: Socio-demographic characteristics of pregnant women attending antenatal care unit at Arba Minch town, Ethiopia, 2020 (n = 451)

Variable	Category	Frequency	Percent %
Age	≤ 24 years	157	34.8
	25-34 years	216	47.9
	≥ 35 years	78	17.3
Educational status of mother	Can't read & write	120	26.6
	Can read and write	91	20.2
	Primary school	54	12
	Secondary & above	186	41.2
Religion of the mother	Protestant	205	45.5
	Orthodox	193	42.8
	Muslim	40	8.9
	Catholic	12	2.7
	Wakefeta	1	0.2
Ethnicity of the mother	Gamo	220	48.8
	Gofa	57	12.64
	Wolaita	65	14.4
	Konso	39	8.66
	Amhara	41	9.1
	Oromo	27	6.0
	Tigre	2	0.4
Marital status	Married	407	90.3
	Single	33	7.3
	Divorced	5	1.1
	Widowed	6	1.3
Occupational status of the mothers	Housewife	211	46.8
	Merchant	54	12.0
	Government	86	19.1
	Farmer	10	2.2
	Laborer	12	2.7
	Student	74	16.3
	Others (private)	4	0.9
Residence of mother	Urban	357	79.2
	Rural	94	20.8
Educational status of the husband	can't read and write	32	7.1
	can read and write	145	32.1
	Primary school	45	10
	Secondary & above	229	50.8
Occupational status of the husband	Farmer	59	13
	Merchant	86	19.1
	Government	173	38.4
	Student	18	4.0
	Laborer	103	22.8
	Others (driver)	12	2.7
Monthly income	0-500	25	5.5
	501-1000	33	7.3
	1001-1500	57	12.6
	1501-2000	91	20.3

>2000	245	54.3

Obstetric factors

From the total pregnant mothers participated in this study 284 (63%) of them were multigravidas. Among the respondents 209 (46.3%) of them were nulliparous. About 262 (58.1%) of the mothers initiate antenatal care follow up before 16 weeks of gestation and 306 (67.8%) of pregnancies were planned. The mean gestational age of the mothers was (23±8) weeks. Majority 420 (93.1%) of the pregnancies were singleton pregnancies. During current pregnancy or previous pregnancy, 338 (74.9%) of the study subjects reported that they doesn't face any type of complication. Among the participants 429 (95.1%) of them said they were counseled on danger signs of pregnancy. Regarding number of antenatal care follow up or visit, from the total participants of this study about 168 (37.3%) of pregnant mothers were on first antenatal care visit during data collection period (Fig 1).

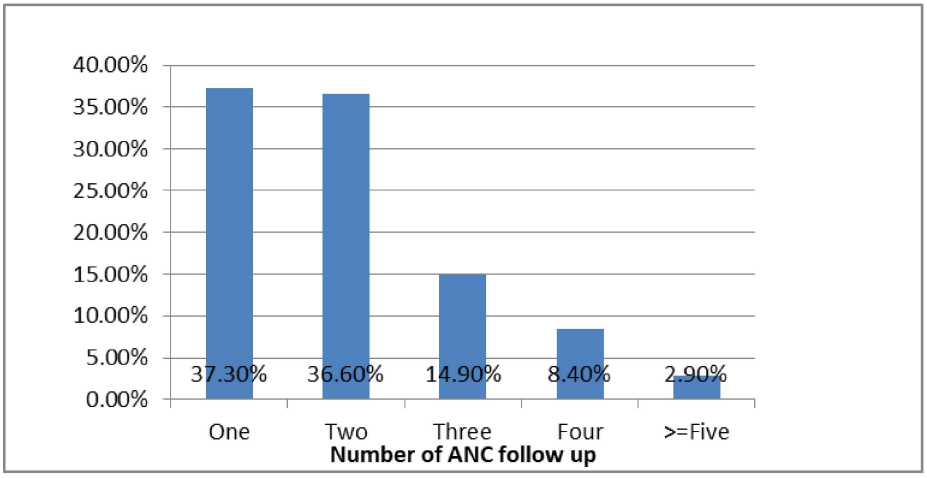

Fig 1: Number of ANC follow up among pregnant women attending antenatal care unit at Arba Minch town, Ethiopia, 2020 (n=451)

Psychosocial factors

Maternal social support scale

Among the respondents 313 (69.4%) of the mothers have good friends who support them, 367 (81.4%) of the subjects had family always there for them and 403 (89.4%) of the mothers said their husband/partner helps them a lot. About 399 (88.5%) the mothers reported they have no conflict with their husband or partner and 391 (86.7%) of the respondents said they did not feel controlled by their husband/partner. The majority 386 (85.6%) of the mothers, feel loved by their husband or their partner. From the participants 212 (47%) of them has low maternal social support (Fig 2).

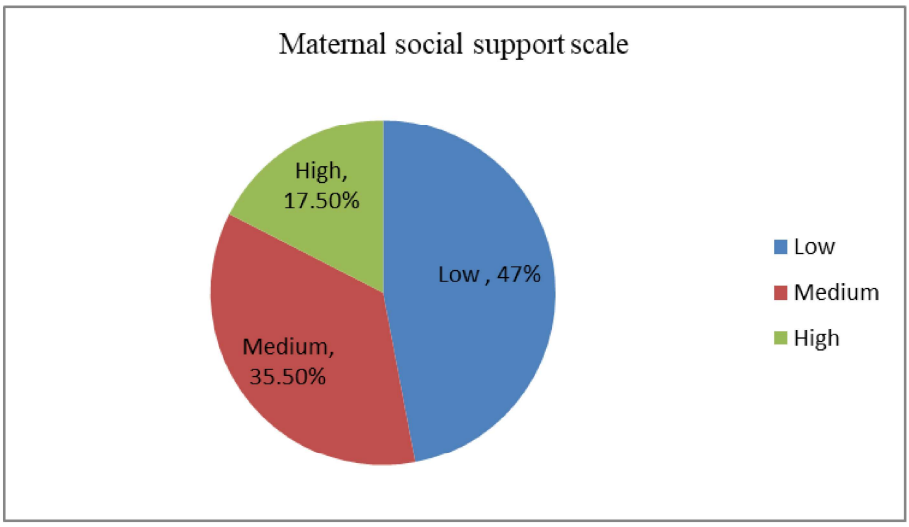

Fig 2: maternal social support scale result among pregnant women attending antenatal care units at Arba Minch town, Ethiopia, 2020 (n=451)

Other psychosocial factors

Among total participants, 316 (70.1%) of them said they have no concern towards their husband worries. From those mothers who have a concern toward their husband worries 51 (52.59%) of them have concern about their husbands health. About 386 (85.6%) of mothers said their husbands provide an emotional support during pregnancy. Among the total participants 390 (86.5%) of mothers said their husbands provide financial support during their pregnancy. Majority 327 (72.5%) of mothers have family support at their pregnancy period. Most 370 (82%) of the mothers were not emotionally or physically abused by their partner or someone important to them. In the last year, 397 (88%) of the subjects said they were not hit, slapped, kicked or otherwise physically hurt by someone; while the rest were hurt.

Perceived stress

The mean value of perceived stress among pregnant women was 12.64 ± 2.8 (mean ± SD). Overall, the prevalence of perceived stress among pregnant women was 23.1% (95% CI; 19.16-26.96%) (Fig 3). From the total participants 379 (84%) of the mothers were upset because of something that happened unexpectedly in the last month, 339 (75.2%) of the pregnant mothers were unable to control important things in their life during the last month and 392 (86.9%) of the subjects have felt nervous and stressed in the last month. About 401 (88.9%) of the mothers felt that they are confident about their ability to handle their personal problems and the majority 406 (90%) felt that things were going their way. The majority 424 (94%) of the participants were

able to control irritations in their life during the last month. In the last month 331 (73.4%) of the subjects were angered because of things that were outside of their control.

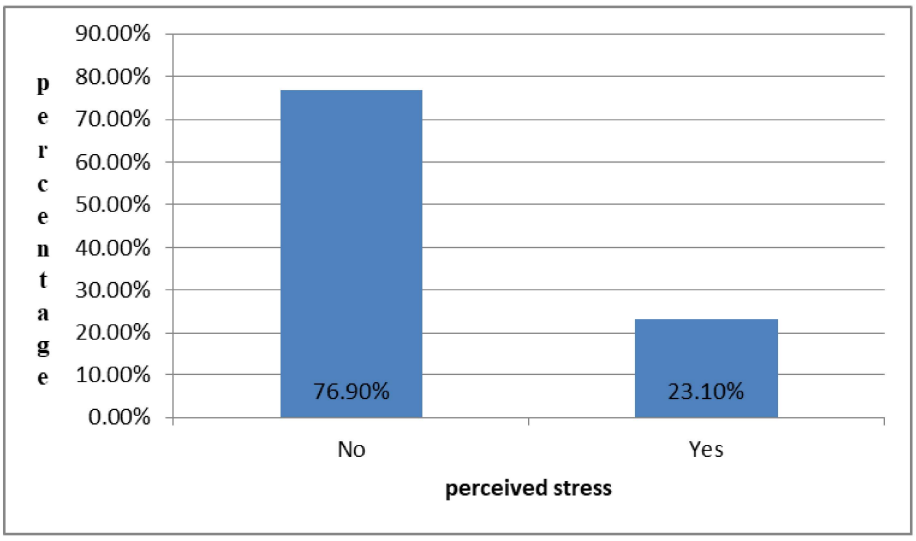

Fig 3: Perceived stress scale among pregnant women attending antenatal care units at Arba Minch town, 2020 (n=451)

Factors associated with perceived stress during pregnancy

In Bivariate analysis educational status of the father, gravidity, time of ANC initiation, gestational age, status of pregnancy (weather planned or unplanned), facing health problem, maternal social support during pregnancy, concern towards husband worries, husband emotional support during pregnancy, husband financial support during pregnancy and family support during pregnancy were included into multivariable analysis. But only, gravidity, time of ANC initiation, gestational age and status of pregnancy were found to be statistically significant at p-value <0.05.

The odds of developing perceived stress during pregnancy was 3.95 times higher among Pregnant women who were multigravida as compared to primigravida woman (AOR= 3.95, 95% CI; 1.94 – 8.02). The odds of having perceived stress was 2.05 times higher among pregnant mothers who initiate antenatal care before 16 weeks than those mothers who initiate antenatal care after 16 weeks of gestation (AOR= 2.05, 95% CI; 1.18 – 3.57). Those mothers with in first trimester of pregnancy had perceived stress 3.03 times higher than mothers with in third trimester (AOR= 3.03, 95% CI; 1.34– 6.85). The likelihood of having perceived stress was about

4.32 times higher for mothers who has unplanned pregnancy (AOR= 4.32, 95% CI; 2.55 – 7.31) as compared to those mothers whose pregnancy was planned (Table 3).

Table 3: Bivariable and multivariable logistic regression model predicting the likelihood of perceived stress among pregnant women attending antenatal care unit at Arba Minch town, Ethiopia, 2020 (n=451)

Variable	Perceived stress		COR (95%CI)	AOR (95%CI)	Pvalue
	Yes	**No**			
Educational status of the father					
Can't read and write	12 (11.4%)	20 (5.8%)	1.93 (0.89-4.21)	2.02 (0.80-5.11)	0.134
Can read and write	29 (28%)	116 (33.4%)	0.91 (0.56-1.5)	0.87 (0.47-1.60)	0.665
Primary school	15 (14.4%)	30 (8.6%)	0.32 (0.09-1.09)	1.85 (0.81-4.24)	0.144
Secondary& above	48 (46.2%)	181 (52.2%)	1	1	0.165
Gravida					
Multigravida	86 (82.7%)	229 (66%)	2.46 (1.41-4.28)	3.95 (1.94-8.02)*	0.000
Primigravida	18 (17.3%)	118 (34%)	1	1	
Time of ANC initiation					
Before 16 weeks	75 (72.1%)	187 (53.9%)	2.21 (1.37-3.57)	2.05 (1.18-3.57)*	0.011
After 16 weeks	29 (27.9%)	160 (46.1%)	1	1	
Gestational age					
First trimester	21 (20.2%)	34 (9.8%)	2.44 (1.28-4.65)	3.03(1.34-6.85)*	0.008
Second trimester	43 (41.3%)	155 (44.7%)	1.09 (0.67-1.77)	1.25 (0.71-2.22)	0.433
Third trimester	40 (38.5%)	158 (45.5%)	1	1	0.062
Status of pregnancy					
Unplanned	65 (62.5%)	80 (23%)	5.56 (3.48-8.89)	4.32 (2.55-7.31)*	<0.000
Planned	39 (37.5%)	267 (77%)	1	1	
Health problems during pregnancy					
Yes	21 (20.2%)	92 (26.5%)	0.70 (0.41-1.19)	0.57 (0.30-1.08)	0.088
No	83 (79.8%)	255 (73.5%)	1	1	
Social support					
Low	63 (60.6%)	149 (42.9%)	2.91 (1.41-6.02)	1.74 (0.73-4.10)	0.206

Medium	31 (29.8%)	129 (37.2%)	1.65 (0.76-3.58)	1.29 (0.54-3.10)	0.556
High	10 (9.62%)	69 (19.9%)	1	1	0.388
Concern toward husband worries					
Yes	40 (38.5%)	95 (27.4%)	1.65 (1.04-2.62)	1.52 (0.88-2.64)	0.130
No	64 (61.5%)	252 (72.6%)	1	1	
Husband emotional support					
No	25 (24%)	40 (11.5%)	2.42 (1.39-4.24)	3.98 (0.392-4.60)	0.243
Yes	79 (76%)	307 (88.5%)	1	1	
Husband financial support					
No	24 (23%)	37 (10.7%)	2.51 (1.42-4.44)	0.34 (0.03-3.67)	0.381
Yes	80 (77%)	310 (89.3%)	1	1	
Family support					
No	40 (38.5%)	84 (24.2%)	1.95 (1.22-3.11)	1.04 (0.57-1.88)	0.883
Yes	64 (61.5%)	263 (75.6%)	1	1	

***** P value <0.05 in final model

DISCUSSION

The study focused on assessing magnitude of perceived stress and associated factors among pregnant women. The magnitude of perceived stress among pregnant women was found to be 23.1% (95% CI; 19.16-26.96%). This finding was higher than the study conducted in Bale zone, Ethiopia (Engidaw et al., 2019). This difference might be due to difference in age group, educational status among each study respondents and geographical factors. This study finding was also higher than the studies carried out in Iran 12.4%, United states of America 6%, Ardabil Iran 7.33% and Canada 17.2% (Shishehgar et al., 2014; Woods et al., 2010; Mirghafourvand et al., 2019; Rieger & Heaman, 2016). The reason for this difference might be the socio-cultural difference, geographical area, economic status and difference in life standard across the countries. The inconsistency can also be due to small sample size especially for studies conducted in Iran in which only 200 mothers participated in the study. The other reason for difference may be due to lack of an ability to deal with stressful events between current study participants and those studies.

Inversely, the finding in this study was lower than studies conducted in Saudi Arabia 33.4%, Ghana 50%, Democratic Republic of Congo 57.1%, Nepal 34%, America 28% and Ghana 28.6% (Ahmed et al., 2017; Ae-Ngibise et al., 2019; Tandu-Umba et al., 2014; Pantha, 2014; Gariepy et al., 2016; Boakye-Yiadom et al., 2015). The discrepancy might be due to difference in socio cultural status, study period and study setting. The difference might be also in Ethiopia the community widely supports women during pregnancy and this may reduce stress among pregnant women.

In current study, multigravida women were more likely to have perceived stress. This finding is supported by studies conducted in Bale zone, and USA (Engidaw et al., 2019; Pais & Pai, 2018). This similarity may be due to the same socio-cultural and living standard across the country with study conducted in Ethiopia. This finding is opposed with studies conducted in Northern Ireland and Bangalore (Lynn et al., 2011; S et al., 2018). This might be due to burden applied to multigravida mothers. This burden can occur due to low economic status and responsibility of raising a child.

In the present study, pregnant women who initiate ANC before 16 weeks of gestation had association with perceived stress. This finding is in contrary with the study employed in China (Lau & Yin, 2011). The difference might be pregnant mothers in this study who have the feeling of stress may seek health care early. Women's in early period of pregnancy stressed due to physiological changes. To alleviate this they may seek health care early and diagnosed with perceived stress. Pregnant women with previous obstetric complications may be highly concerned about current pregnancy status and this can lead them to have stress. So, as known if the women has previous pregnancy problem there is a high chance that she goes to health institution early and she may be diagnosed with stress before 16 weeks of gestation.

According to this study finding, pregnant women with in first trimester of gestation had perceived stress. This finding is in line with the study carried out at Bale zone of Ethiopia (Engidaw et al., 2019).

This study finding shows that perceived stress during pregnancy was higher for mothers whose pregnancies were unplanned. This finding is supported by studies conducted in India and China (Vijayaselvi et al., 2015; Lau & Yin, 2011). The consistency may be due to dilemma about what to do with unplanned pregnancy, lack of social support and lower socioeconomic status and

inability of raising a child with limited resource. Stress may also develop among mothers uninterested in accepting unplanned pregnancy and unable to raise a child.

CONCLUSION

In this study, the magnitude of perceived Stress during pregnancy was high. Multigravidas, antenatal care initiation before 16 weeks of gestation, first trimester pregnancy and unplanned pregnancy expose the mother to perceived stress during pregnancy.

RECOMMENDATION

Appropriate measures should be taken to improve multigravida women emotional level and pregnant women should be encouraged to initiate ANC early. Special attention should be given to women in 1st trimester and with unplanned pregnancy. Further study should be conducted using mixed method.

LIST OF ABBREVIATIONS

ANC: Antenatal Care

MSSS: Maternity Social Support Scale

PSS: Perceived Stress Scale

WHO: World Health Organization

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