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SOCIOECONOMIC AND GEOGRAPHIC DISPARITIES IN PREGNANCY: A CROSS SECTIONAL STUDY ON GESTATIONAL ANEMIA AND ANXIETY

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Abstract

Background: *High Socioeconomic Status empowers female with self-assurance and can contribute to a healthy life, particularly during pregnancy. Women which are living in urban settings are better equipped to manage conditions such as gestational anemia but face distinct stressors for pregnancy-related anxiety. The lower SES & problems related to living in second biggest city of Province Sindh may potentially leading to a greater frequency of anemia & anxiety during pregnancy.*

Material & Methods: *This study was steered at Zoology Department of University of Sindh with alliance to Liaquat University Hospital (LUH), Hyderabad during from the second* ***month of 2024 to the final month of 2024****. 362 pregnant females were recruited. Sampling technique applied was to be "Non- probability Purposive", then recruited study participants initially interviewed for residence, SES and asked "Hamilton Anxiety Rating Scale-A" to elucidate PSA. Lastly, Hb levels were checked via "automated analyzer".*

Results: *Pregnancy Specific Anxiety and Gestational Anemia was vastly rampant particularly in urban 75% and 74% respectively. Participants from lower socioeconomic status had steep prevalence of both PSA and GA 40% and 43 % respectively. However, PSA was also higher 40% in middle SES population. P value <0.05 was estimated and predicted to be just significant to suggestive of linkage of anxiety and anemia during pregnancy with urbanization and poverty.*

INTRODUCTION

Maternal morbidity and mortality is towering issue in Pakistan. Pakistan is significantly behind to achieve its objectives of providing standard and equal health care. Compounding factors impersonated by rural settings like insufficient skilled personnel, inadequate facilities, social constraints, economic deprivation, and widespread ignorance aggravating the aforementioned problems (Shaeen et al 2022). Worldwide urban residence expends just above 55% but it has reached above 65% in district Hyderabad (Ul Din, S et al 2021). Overall Sindh Urban area has double poverty rate as compared to rural residents. Abolition of such prevailing disparity has become essential to ensure equivalence and nurture development of such communities (Murtaza, I et al 2024).

Stevens et al. (2013) suggested that significantly beneficial health outcomes can be noticed for both mother and child, if mother belongs to a higher Socio-Economic Status (SES). Kim and Lee (2022) predicted

that gestational anemia (GA) is avoided by an increased blood supply during pregnancy, a physiological change seen in maternal circulation. Nguyen et al. (2022) predicted an amplified demand for nutrients such as iron, folic acid, and vitamin B_{12} during pregnancy which may not be full filled due to poverty or higher life expenses in urban lifestyle. Incidence of GA reported to be 38% by Patel and Singh (2023) while Smith et al. (2023) explicated this peak is chiefly because of higher nutritional necessities accredited to physiological modifications. Hb < 11g/dL, diagnosed as GA (WHO, 2023).

Pregnancy Specific Anxiety identified by Garcia et al. (2022), categorized by enduring fears and suspicions regarding motherly and fetal consequences in relation to pregnancy. Biaggi et al., 2016 & Gelaye et al., 2016 had previously concluded maternal SES and urbanization as risk factors for PSA development. Pinto-Meza et al. (2013) found a negative correlation between Higher SES and anxiety. Urbanization can act as stressor for anxiety that influences numerous features of life and may aggravate anxiety through intersected mechanisms such as polluted environment, more violence, a sense of overcrowded, and reduced social support, which disposes women to psychological challenges, complicating the pregnancy (Liu, Jody et al., 2024). Ahmed et al. (2024) distinguished that GA can negatively impact "mood" and "cognitive functions". Chowdhury and Rahman (2023) emphasized on irregular treatment devotion is rampant among prenatal females due to poverty, insufficient education or counseling.

MATERIAL AND METHODS

Study Design & Setting: To understand relationship of maternal SES and urbanization with anxiety and anemia during third trimester, this cross sectional was steered at Zoology Department of University of Sindh with alliance to Liaquat University Hospital (LUH), Hyderabad during from the second **month of 2024 to the final month of 2024**.

Participants:

362 pregnant females visited in our study period at LUH, Hyderabad and tested for Hb were recruited in our sample size which was estimated by Open Epi Calculator based on GA prevalence in Hyderabad. Sampling technique applied was to be "Non-probability Purposive", then recruited study participants were assessed for PSA by medical professional. Female with twin pregnancy, essential hypertension or having, psychotic or and endocrine disorders were excluded from this study.

Data Collection:

After requisition, consent pro-forma were given and purposes of study were clarified to participants in their native linguistic and no economic affliction enforced on subjects for this study. Initially, participants participated in an interview for demographic features like residence and level of SES then a healthcare professional asked pre-designed questionnaire based on "Hamilton Anxiety Rating Scale-A" to elucidate PSA. Lastly, Hb levels for GA were checked from blood samples of study subject via "automated analyzer".

Statical Analysis:

Initially, collected data was processed and analyzed by MS excel. Socioeconomic and geographic variables and presence of "GA" and "PSA" were expressed as frequencies and percentages while Chi-Square test was implemented to measure significance.

RESULTS AND DISCUSSION

The occurrence of different variables among female presented in final trimester is categorized in Table I to ascertain their frequencies and percentages.

Table: I-Frequencies of Study variables (n=362)

Variable	Frequency	Percentage
Residence		
• Urban	253	70%
• Rural	109	30%
Socioeconomic Status	118	33%
• Low	154	42%

• Middle	90	25%
• High	159	44%
Anxiety Status	203	56%
• Present	235	65%
• Absent	127	35%
Hb Level		
• <11g/dL		
• >11g/dL		

According to geographic distribution, 70% studied female lived in urban areas while only 30 study participants lived in rural, as shown in Table I. It also elucidated grouping of studied participants on the basis of Socioeconomic Status (SES) where three distinct categories of PWs are summarized as having 25%, 42% & 33% High SES or upper class, Middle SES or Middle class and low SES or lower class respectively.

Health care professional after detailed interview based on "HAM-A Scale" differentiated about 44% female to possess symptoms of "PSA". In line to our results, many studied showed similar incidence of PSA in final trimester such as 43% by Somerville et al., 2014, 39% by Viswasam et al., in a study conducted in India, 40% by Niazi et al 2023., in a study of Herat Afghanistan while Fairbrother et al. 2016, proposed intensified incidence of PSA in poor mothers with lack of awareness concerning pregnancy adverse outcomes.

Blood reports showed almost two-third mothers presented in final trimester i.e. 65% had Hb < 11 g/dL. This peak of anemic incidence in Hyderabad is of high concerns. Our study revealed a higher prevalence of GA in younger female similar to Fouzia, MB et al., 2019 where author also emphases on multiple pregnancies, nutritional deficiencies or higher iron demand as major reasons of higher prevalence. Sivaganesh et al., 2019 also included 320 female in their pregnancies, during study, established 60% GA with highest counted cases of Iron deficiency anemia (IDA). Clotilda et al., 2024 analysis based on multiple countries like India, Burundi and Togo showed GA prevalence between 60-67%.

Table: II Frequencies of Geographic and Socioeconomical variables among female diagnosed with & without PSA

Variable		Pregnant Women (n=362)		Total	p-Value
		With PSA	Without PSA		
Residence	Urban	120	133	253	
		75%	66%	70%	
	Rural	39	70	109	0.04
		25%	34%	30%	
Socioeconomic Status	Low	63	55	118	
		40%	27%	33%	
	Middle	63	91	154	
		40%	45%	42%	0.033
	High	33	57	90	
		21%	28%	25%	
Total	Total	159	203	362	
		100%	100%	100%	

Chi-Square test was applied. P-value level < 0.05 is significant.

From Table II, When study participants plotted based on residence, "75% of PSA participants were from urban areas; In comparison, 66% of Non-PSA

participants came from urban regions, while a higher percentage of Non-PSA participants (34%) were from rural areas compared to PSA participants (25%), indicating that urban residence may be associated with being in the PSA category, as the p-value of 0.04 suggests a statistically significant difference in locality distribution". Participants from lower socioeconomic status are more present in the PSA group (40%) than in the non-PSA group (27%), while middle and high SE status show less of a stark difference; the p-value of 0.033 indicates that socioeconomic status is significantly associated with PSA status, this suggests that those from lower SES backgrounds may face more significant health challenges or barriers to access related to PSA.

Accordant to our findings regarding maternal socioeconomic status and anxiety, female belonging to poor family has the highest prevalence of anxiety, Muglia, L.J., Benhalima, K., Tong, S. et al., 2022 & Ahmad, A., & Mushtaq, R. et al., 2024 shown same trait as well as Qureshi et al., 2020.

Many international studies i.e. Chala et al. 2024 & T. Cadman et al. 2024, seem consistent with our finding of higher frequency of anxiety related to pregnancy in urban women as shown in Table II also seen in women of USA, Ethopia, Romania due to high living cost, unemployment, domestic violence and social isolation was very common among these women while studies conducted in Pakistan i.e. Waqas A et al 2015, Gul, Ejaz, et al., 2019 contradicted our finding of lower anxiety in rural settings, as they concluded a higher psychological morbidity due to multiple contributing factors like greater poverty, gender discrimination, less health facilities or lack of basic services, unemployed spouse, domestic violence etc.

Table: III Frequencies of Geographic and Socioeconomical variables among female diagnosed with & without Anemia

Variable		Pregnant Women (n=362)		Total	p-Value
		Non-Anemic	Anemic		
Residence	Urban	80	173	253	0.04
		63%	74%	70%	
	Rural	47	62	109	
		37%	26%	30%	
Socioeconomic Status	Low	23	102	125	0.033
		18%	43%	35%	
	Middle	57	90	147	
		45%	38%	41%	
	High	47	43	90	
		37%	18%	25%	
Total	Total	159	203	362	
		100%	100%	100%	

Chi-Square test was applied. P-value level < 0.05 is significant.

Table III showed a strong affiliation between locality and anemia status in our study, where more than three-fourths (74%) of anemic and more than three-fifths (63%) of non-anemic individuals belonged to urban localities. Only 26% of subjects in rural environments have anemia, compared to 37% of non-anemic participants: the p-value of 0.03 reaffirms the significant association, indicating that different factors in urban areas may contribute to anemia rates: healthcare access, nutrition, and health education".

This warrants increased public health interventions in urban areas to tackle the fundamental causes of the anemia burden in this population. The disparity in anemia status is underscored by socioeconomic status, "As 43% of participants classified as anemic were classified in low SE (SE status of anemic participants; SE status of non-anemic participants). In the mid-SES, 45% belong to the non-anemic group as opposed

to just 38% being anemic. A p-value of less than 0.0001 reinforces the strong correlation that people from lower socioeconomic backgrounds are more at risk for having anemia". The same holds for lower SE groups, where inherent systemic factors are responsible for malnutrition, leading to challenges like anemia that need to be addressed on a broader scale.

Baksh, FM et al., 2019 indicated Urban and rural PWs suffering from anemia at rates like 29% and 50% which is contradicted to our study where data analysis showed a higher incidence of anemia in female residing in urban locality as shown in Table III. Yakar B et al., 2021 showed greater to 50% prevalence of anemia in pregnancy in Pakistan but it peaks among women belonging to poorer families this finding is in line to our data.

CONCLUSION

Our research specifies that a poorer level of maternal SES is significantly linked with adverse outcomes in gestational age and pregnancy-specific anxiety, thereby prominently disturbing general maternal health. Executing nutritional support programs and adding to knowledge of pregnant women might aid lessen the rate of anemia and anxiety among such females, It has become the point of time to not only offer nutritional support to prenatal female but also to enhance community awareness programs and add medications for anxiety, particularly in urban areas with poor family background.

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CONFLICT OF INTEREST

None.

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