Perception of Health Staff on the Management of Anaemia in Pregnancy: A Case of Cape Coast Metropolitan and Twifo Praso Hospitals

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Abstract: *The overall goal of this study was to assess health professionals' perceptions of AIP management in the Central region: the case of Twifo Praso and CCMA Hospital Staff. The study employed a descriptive cross-sectional design that employed quantitative tools to investigate health professionals' perceptions of AIP management in the Central region. The study population comprised 330 health professionals from Cape Coast Metro Hospital and Twifo Praso Hospital. The Questionnaire was the main data collection instrument for the study. For the data analysis, both descriptive statistics and inferential statistics were used. It was shown that respondents effectively managed moderate AIP and that overall management competence perception on moderate AIP measured was high. Also, it was found that respondents had good management competence in severe anaemic conditions management. Further, it was discovered that respondents effectively counseled clients with AIP to access the facilities. Furthermore, the predicators such as community, household, socio-cultural, EBS, and clinical health perception explained 82.0% of the variability in effective management of AIP. Moreover, it was found that the positive clinical health perception of respondents explained 84.9% of the change seen in AIP management, and that community factors positively contributed 60.8% to AIP management. The final direct relationship established by the factors shows that environmental, behavioral, and social factors affected AIP management by 25%. The following recommendations were proffered after the findings of the study: 1) In order to effectively manage AIP, health facility management must instill in their employees positive clinical and health attitudes. 2) Management should ensure that health staff members' community and household perceptions are consistent with clinical health beliefs. This could be achieved through regular workplace surveys to gauge and realign such perceptions. 3) Management should hold regular and well-timed workshops to reorient clinical and health beliefs of health workers in their facilities. 4) Health staff was to ensure that socio-cultural biases and beliefs were not carried out in the discharge of management of anemia in pregnancy at their facilities.*

Keywords: *Anaemia, health staff, anaemia in pregnancy, Cape Coast, Ghana*

1. Introduction

Anaemia in pregnancy (AIP) has been defined as a condition of a pregnant client having less than the normal number of red blood cells or less than the normal quantity of hemoglobin in the blood. The oxygen carrying capacity of the blood is therefore decreased (WHO, 2016). In clinical terms, AIP is manifestations of Hemoglobin< 11g/dl and some pale manifestations in the pregnant woman. Further, WHO (2016), defines AIP as the state whereby a pregnant woman is disagnosed of an Hb concentration below 11 g/dl in the first half of pregnancy or 10.5 g/dl in the second half of pregnancy. Additionally pregnant women with categorised AIP into mild AIP (Hb = 10-10.9g/dl), moderate AIP (Hb = 7.0-9.9g/dl) and severe AIP (Hb < 7g/dl). AIP has both short- and long-term consequences such as preterm, low birth weight, morbidity and mortality (Black, et al., 2011; World Health Organization, 2015 & 2016; Kassa, Muche, Berhe & Fekadu, 2017). In 2016, WHO estimated that AIP affected 38.2% of pregnant women globally, with the highest prevalence in South-East Asia (48.7%) and Africa (46.3%)

(WHO, 2016; Tadesse, et al, 2017). AIP affects about 1.62 billion people, 56 million of whom are pregnant women (WHO, 2016). In Ghana, a national Demographic and Health Survey in 2014 determined that 42% of pregnant women were anaemic compared to 70% in rural parts of the country (Ghana Statistical Service, Ghana Health Service, and ICF International, 2015).

Several causes have been attributed to AIP (WHO, 2016). The causes of AIP include environmental, behavioral, and social factors that limit adequate nutrient intake and absorption, or exposure to infectious diseases (WHO, 2016). In addition, AIP risk is related to household-level factors such as access to water and sanitation, availability of health services, access to diverse food sources, use of insecticide treated nets and knowledge about AIP prevention. Other household- or community-level factors include socioeconomic status, culture, wealth – status and education attainment (Ngnie-teta, Kuate-defo & Receveur, 2008; WHO, 2016). In developing countries including Ghana, pregnant women often start gestation with depleted or low body iron stores, making them especially vulnerable to iron deficiency AIP (WHO, 2016; Saaka, Oladele, Larbi, & Hoeschle-zeledon, 2017). Hb concentration declines during pregnancy, partly because of expanded plasma volume compared to red cell mass (Darnton-hill & Mkparu, 2015; Saaka, Oladele, Larbi, & Hoeschle-zeledon, 2017). This is influenced partly by the iron status of the pregnant woman, representing a major public health problem in sub-Saharan Africa (WHO, 2016; Saaka, Oladele, Larbi, & Hoeschle-zeledon, 2017). Another contributor to AIP is parasitic infections/infestation such as malaria, hookworm and schistosomiasis, especially in areas of Ghana where these infections are endemic (WHO, 2015).

In addition, chronic infections such as tuberculosis (TB) and human immune-deficiency virus (HIV) increase risk of AIP (WHO, 2015). This condition may lead to premature delivery, intrauterine growth retardation, and increased risk of malnutrition, morbidity and mortality for the mother, growing fetus and newborn (Saaka, Oladele, Larbi, & Hoeschle-zeledon, 2017; Scholl, 2018). In fact, findings from several studies (Ashly, Jeevan, Renita, Shantia, Vineesha & Vinaya, 2014; Chiedza & Sungano, 2018; Tashara, Achen, Quadras, D'Souza, D'Souza & Sankar, 2015) indicate that inadequate knowledge and management of AIP from the pregnant women's perspective has adverse effect on pregnancy outcomes and complications. However, other studies such as Urassa, Carlstedt, Nystrom, Massawe and Linmark (2002) and Venkatramana, Nazia and Ismail (2017) discovered that inadequate knowledge on management of AIP on the part of nursing professionals and other medical professionals had resulted in much of the complications in pregnancy and adverse pregnancy outcomes. Apart from the studies conducted by Urassa, Carlstedt, Nystrom, Massawe and Linmark (2002) and Venkatramana, Nazia and Ismail (2017) Australia and India respectively, little is known about health professionals perception on management of AIP in Ghana (Adokiya, Aryeetey, Yost, Jones & Wilson, 2019). Therefore, it is important for a study of this nature to be conducted at Cape Coast Metropolitan Hospital and Twifo Praso District Hospital to ascertain the perception of health professionals on management of AIP. Venkatramana, Nazia and Ismail (2017) argue that adequate knowledge on management of AIP from the health professionals' perspective is crucial to maternal health outcomes and neonatal mortality. Therefore, a well – positioned ANC and maternal health facilities must be competently managed with knowledgeable health professionals with requisite skills and knowledge to help avert adverse maternal and neonatal outcomes.

2. Materials and Methods

The study was a descriptive cross-sectional design using quantitative tools to investigate the perception of health staff on the management of AIP. Creswell and Clark (2007) defined a cross-sectional study design as a study, which limits its observations to a single point in time. They explained that a descriptive research is concerned with describing a phenomenon within its context. The quantitative research method shares the theoretical assumption of the functional or positivist paradigm, which is based on the assumption that social reality has an objective ontological structure and individuals are responding agents to this objective environment (Creswell & Clark, 2007). Cunliffe (2010) holds the view that measurements in quantitative research are reliable, valid, and generalizable in

predicting cause and effects. Hence, researchers using the quantitative method have in mind the view to quantifying the data they generate in order to establish relationship between variables.

The population of the study comprises staff of Cape Coast Metropolitan hospital and Twifo Praso Hospital. The Cape Coast Metropolitan hospital has about 260 staff members and that of Twifo Praso Hospital has exactly 260 staff members' delivery health care. The target population will consist of all the medical staffs excluding supporting staff in the health facilities of interest. In order to determine the sample size for the Twifo Praso Hospital staff, the Krejcie and Morgan (1970) formulae was used for estimating the sample size. This formula is used because it is useful for estimating the sample size in a known population. Since the sampling population of staff was less than 10000, the sample size is adjusted using Fisher's recommendation formula: There are about 260 staff members of Cape Coast Metropolitan Hospital. Therefore, considering an adjustment to the sample, 170 health staff from Cape Coast Metropolitan Hospital was required for the study. In total sample of 330 health staff from the Cape Coast Metropolitan hospital and Twifo Praso Hospital was considered for the study. All the 330 health staff of the two health facilities was be given equal choice of being selected for the survey. Randomness was being determined for the 330 selected health staff respondents for the study by simple random sampling. Each of the 330 health staff was assigned to an envelope bearing a number with its name inside. Envelopes were serially numbered. Microsoft—Excel software computer program was used to randomize the envelope numbers to obtain the names of the 330 health staff. That is 160 health staff for Twifo Praso Hospital and 170 staff for Cape Coast Metropolitan Hospital respectively. Each respondent that fall within the inclusion criteria and consented to participate in the study was be recruited. The variables that was be captured and reviewed in the study using the data collection instrument to be developed include respondents' demographic information such as age, gender, educational background and occupation. Section B was be used to extract information about the knowledge of staff on AIP which addresses objective 1. Section C was be used to extract information on management of AIP to address objective 2. The section A was consist of multiple choice items and that of Section B – C was be 5 – scaled Likert type items for respondents to choice from strongly disagree to strongly agree.

The questionnaires were distributed to the 330 respondents in the two selected health facilities in Cape Coast and Twifo Praso to be filled within a period of two days. The researcher and research assistants will follow up after two days to collect all the completed questionnaires from the health staff. That health staffs that may not have completed the questionnaires due to being occupied with routine job activities were given another two more days to accurately take their time completing the structured questionnaire given to them. After the questionnaires have all been filled out, the researcher and research assistants will collect all the 330 questionnaires distributed and process them for data entry. The two research assistants were recruited from the two health facilities where the study was taking place. The main training given to the research assistants was on the explanation of the study objective to the respondents and how the respondents were able to fill in the questionnaires correctly. They were told to inquire further after a respondent partially filled out a questionnaire and ask whether he/she would like to complete the missing items or leave it as is. Since they were trained not to use pressure and persuasion on the respondents, such an incident may not make them compel respondents at any time in the survey to withdraw or change their mind. The data capture was entered into the Statistical Package for Social Sciences (SPSS) Version 21.0 database and examined, cleaned, and analyzed. Various relevant tables and figures were being created from the data to allow for easy analysis and interpretation. Means, standard deviation, frequencies, and proportions in tables and appropriate charts (i.e., histograms, pie charts, and pareto charts) were used to present the results for objective 1 and objective 2. The objective three was analysed with multiple regression to assess the relationship between knowledge and competencies in the management of AIP among health staff at the selected facilities of interest.

3. Results

Socio – Demographics

The Table 1 shows the socio – demographic characteristics of respondent. The male respondents from the study composed 31.8% and female consisted of 68.2% of the entire respondents. Respondents aged 18 − 24 years were 27.1%, 25 − 33 years were 39.0%, and 34 − 40 years were made up of 15.9%. Finally, the respondents aged 40 years and above composed of 18.1%. The single respondents were made of 57.4% and 42.6% were made up of married persons. Further, the majority of respondents had Bachelor's degree (65%) and those with Diploma certification were 35% of the entire respondents of the study. Furthermore, Table 4.1 shows that 51.6% of respondents were Registered nurses, Midwives were 44% and Medical Doctors were 4.3% respectively. From Table 1, the respondents with less than 5 years working experience consisted of just 4.3%, those with 5 − 6 years consisted of 15.5%. Majority of the respondents had worked 7 − 8 years (50.2%) and those with 9 − 10 years of experience were 25.3% and those with the highest years of experience comprising of 10 years and above were constituted of 4.7% of the respondents.

Table 1: Socio – demographic characteristics of respondent

Socio – demographic characteristics		Frequency	Percent
Sex	Male	88	31.8
	Female	189	68.2
Age	18 − 24	75	27.1
	25 − 33	108	39.0
	34 − 40	44	15.9
	Above 40	50	18.1
Marital status	Single	159	57.4
	Married	118	42.6
Academic qualification	Diploma	180	65.0
	Bachelor's degree/above	97	35.0
Job position	Nurse	143	51.6
	Midwife	122	44.0
	Medical Doctor	12	4.3
Working experience	Less than 5 years	12	4.3
	5 − 6	43	15.5
	7 − 8	139	50.2
	9 − 10	70	25.3
	10 or above	13	4.7
Hospital	CCMH	150	54.2
	TPDH	127	45.8
	Total	277	100.0

Research question 1: What is the perception of health professional on management of anaemia in pregnancy?

The research question 1 investigated the perception of health professionals on the management of anaemia in pregnancy. Table 2 shows the management of moderate anaemic conditions of pregnant women from health professionals' perspective. The Table 2 indicated that to effectively manage moderate AIP and that overall management competence on moderate AIP was high (Mean=4.2107, SD=.38289). The details of management competence on moderate anaemic conditions were as follows: Anaemia causes weakness (making it hard for the mother to think and care for the family) and delivery becomes high risk (Mean= 4.7256, SD=.56192). Even if a woman feels well, she must keep taking ferrous sulphate/folic acid, to avoid high risk delivery and to keep her baby healthy (Mean=3.7545, SD=

.68975). Counsel about compliance, safety, and side effects (Mean=4.7256, SD=.56192). It is recommended for pregnant women "Eat fresh fruits and vegetables (help absorb iron), fish, meat and eggs, if Possible" (Mean=4.7256, SD=.56192). Further, for pregnant women "avoid hookworm infestation, by wearing shoes and improving personal hygiene and sanitation" (Mean=4.7256, SD= .56192). Furthermore, black stools, constipation, abdominal pain and nausea. These are seen as dangerous to pregnant women's anaemic health (Mean=2.4585, SD=1.26373). Moreover, pregnant women with moderate anaemic conditions should be "give 500 mg as a single dose (Mean=4.2166, SD=.97988) and that it is recommended for pregnant women to be "given a single dose in the second (4-6month) and third trimester (7-9 month)" (Mean=4.7112, SD=.45403). Finally, it was indicated that one needs not give these doses, if in first trimester (first 3 months) (Mean=4.7256, SD=.56192).

Table 2: Management of moderate anaemic conditions

Management of moderate anaemia	Mean	Std. Deviation
Anaemia causes weakness (making it hard for the mother to think and care for the family) and delivery becomes high risk.	4.7256	.56192
Even if a woman feels well, she must keep taking ferrous sulphate/folic acid, to avoid high risk delivery and to keep her baby healthy.	3.7545	.68975
Counsel about compliance, safety, and side effects.	4.7256	.56192
Eat fresh fruits and vegetables (help absorb iron), fish, meat and eggs, if Possible.	4.7256	.56192
Avoid hookworm infestation, by wearing shoes and improving personal hygiene and sanitation.	4.7256	.56192
Black stools, constipation, abdominal pain and nausea. These are not dangerous.	2.4585	1.26373
Give 500 mg as a single dose	4.2166	.97988
Give a single dose in the second (4-6month) and third trimester (7-9 month).	4.7112	.45403
Do not give if in first trimester (first 3 months).	4.7256	.56192
Overall Moderate AIP Management	**4.2107**	**.38289**

The Table 3 also showed the details for severe anaemic conditions management. Table 3 indicated that respondents had good management competence on severe anaemic conditions management (Mean=4.1964, SD=.37695). The procedure for the severe anaemic management were as follows: Give ferrous sulphate 200mg 8 hourly plus folic acid 5 mg daily for 3 months minimum, until pallor disappears (Mean=4.7256, SD=.56192). Try and follow up every 2 weeks (Mean=4.0253, SD=.48463). The combination tablets with folic acid may be used (Mean=2.4585, SD=1.26373). On the packet write how often and how many tablets to take (Mean=4.5487, SD=.67725). If mother still anaemic at 36 weeks of gestation or at time of delivery: refer to a well-equipped facility for further management (Mean=4.7256, SD=.56192). Emphasize a realistic balanced diet rich in proteins, iron and vitamins, e.g. red meat, liver, dark green vegetables (Mean=4.1336, SD=.57122). Treat malaria presumptively with SP in 2nd and 3rd trimesters and follow up (Mean=4.2166, SD=.97988). Deworm the patient with mebendazole 500mg single dose in 2nd and 3rd trimesters and follow up (Mean=4.7256, SD= .56192). Monitor the response to treatment by HB estimation every 2 weeks (Mean=4.0253, SD=.48463). If patient has sickle-cell disease: refer to higher level for ANC and delivery (Mean=4.0217, SD=.33981). Counsel mother on compliance, safety and side effects of the treatment (Mean=4.7112, SD=.45403).

Table 3: Management of severe anaemic conditions

Statements	Mean	Std. Deviation

Give ferrous sulphate 200mg 8 hourly plus folic acid 5 mg daily for 3 months minimum, until pallor disappears.	4.7256	.56192
Try and follow up every 2 weeks.	4.0253	.48463
The combination tablets with folic acid may be used.	2.4585	1.26373
On the packet write how often and how many tablets to take.	4.5487	.67725
If mother still anaemic at 36 weeks of gestation or at time of delivery: refer to a well-equipped facility for further management.	4.7256	.56192
Emphasize a realistic balanced diet rich in proteins, iron and vitamins, e.g. red meat, liver, dark green vegetables.	4.1336	.57122
Treat malaria presumptively with SP in 2nd and 3rd trimesters and follow up.	4.2166	.97988
Deworm the patient with mebendazole 500mg single dose in 2nd and 3rd trimesters and follow up.	4.7256	.56192
Monitor the response to treatment by HB estimation every 2 weeks.	4.0253	.48463
If patient has sickle-cell disease: refer to higher level for ANC and delivery.	4.0217	.33981
Counsel mother on compliance, safety and side effects of the treatment.	4.7112	.45403
Overall Severe AIP management	4.1964	.37695
Valid N (listwise)		

On the research question 1, counseling for both moderate and severe anaemic conditions management. Table 4 indicates the strategy for counseling of AIP clients in the facilities studied. Respondents stated that that they agreed to the effective counseling of AIP clients (Mean= 4.2352, SD=.36647). The details for the effective counseling of AIP clients were as follows: Revise birth plan with the mother (Mean=3.2852, SD=.92170). Advice and refer mother to deliver in a well-equipped facility i.e. with blood transfusion services and further management (Mean=4.7256, SD=.56192). Further, Advice mother to go to the facility at the onset of labor if she leaves near the facility (Mean=4.1372, SD=.57353). Pregnant woman should move and stay either near the facility and stay with family or friends or stay at the maternity waiting home if available in that referral facility (Mean=4.1986, SD=1.08361). Further, a pregnant woman should return for more ferrous sulphate/folic acid before her current supply runs out (Mean=4.2166, SD=.97988). Furthermore, health workers should ensure that pregnant mothers who attend ANC are given at least 1 month's minimum supply (30 tablets in total) per visit (Mean=4.7112, SD=.45403). Give curative treatment according to current malaria treatment policy (Mean=4.7256, SD=.56192). It was recommended that oral quinine tablets for treating simple/un complicated malaria in the first trimester and Coartem for use in the second and third trimesters (Mean=3.7545, SD=.68975). For severe malaria refer mother to a well-equipped facility for further management (Mean=4.1047, SD=.43391). Followed by IPT in second and third trimester (Mean=4.1047, SD=.43391). There was an overall effective management as perceived by respondents of this study as well (Mean=4.2352, SD=.36647).

Table 4: Counseling on anaemia in pregnancy

Statement	Mean	Std. Deviation
Revise birth plan with the mother	3.2852	.92170
Advice and refer mother to deliver in a well-equipped facility i.e. with blood transfusion services and further management.	4.7256	.56192
Advice mother to go to the facility at the onset of labor if she leaves near the facility	4.1372	.57353
Pregnant woman should move and stay either near the facility and stay with family or friends or stay at the maternity waiting home if available	4.1986	1.08361

in that referral facility.

A pregnant woman should return for more ferrous sulphate/folic acid before her current supply runs out.	4.2166	.97988
Health workers should ensure that pregnant mothers who attend ANC are given at least 1 month's minimum supply (30 tablets in total) per visit.	4.7112	.45403
Give curative treatment according to current malaria treatment policy	4.7256	.56192
Oral quinine tablets for treating simple/un complicated malaria in the first trimester and Coartem for use in the second and third trimesters.	3.7545	.68975
For severe malaria refer mother to a well-equipped facility for further management.	4.1047	.43391
Follow by IPT in second and third trimester.	4.1047	.43391
AIP Counseling	4.3077	.41430
Overall AIP management	**4.2352**	**.36647**

Research question 2: What are the determinants of anaemia in pregnancy from the health professional perspective?

The research question 2 investigated the determinants affecting the management of anaemia in pregnancy. The exploratory factor analysis (EFA) was used to analyse the factors and the variables fit to the study. The following were the analysis of the factors:

Exploratory Factor Analysis (EFA)

Basically, the application of factor analysis in this study was an attempt to establish relationships among the variables contributing to the factors identified from the literature review. For Data Reduction, the principal components method of extraction begins by finding a linear combination of variables accounting for as much variation in the original variables as possible. It then finds another component that accounts for as much of the remaining variation as possible and is uncorrelated with the previous component. It follows through in this pattern until there are as many components as original variables. Usually, some few components will account for most of the variation, and these components can be used in place of the original variables (Costello & Osborne, 2005).The variables measuring the construct environmental, behavioural and social, socio – cultural, household, community, clinical health and AIP management were factor analyzed. Before running the exploratory factor analysis, the Bartlett test of Sphericity (Approx. Chi-square= 6348.277, df. 411, Sig. = 0.000) and the KMO measure of sampling adequacy (Value of .723) confirmed that there was significant correlation among the variables and thus, a strong basis for the application of exploratory factor analysis.

Only 60 variables whose Eigen values were equal to or greater than 1 were selected (Malhotra & Birks, 2007). In addition, variables with loadings of at least 0.5 and factors with a reliability threshold of 0.6 (Hair, Black, Babin, Anderson & Tatham, 2010) were selected for the analysis. In the initial exploration, all the sixty two (62) variables were factor analyzed in an attempt to identify latent variables explaining the respondents' views on each of the factors, identify the relationship between different latent variables, identify the smallest possible number of variables that measures the constructs to simplify the proposed framework, as well as explaining the inter-correlations among observed variables. The variables measuring the factors were found to explain altogether a satisfactory 92.72% of the total variance.

Varimax Rotation of the Exploratory Factor Analysis (EFA)

The sixty two (62) variables were later rotated using the Varimax rotation as the extraction method. The results revealed that 60 variables loaded perfectly onto six factors (with one being the dependent variable). Out of the 62 variables inputted, only 60 of them loaded perfectly onto the six factors excluding 2 variables that failed the test of inclusion. Factor one had 5 variables relating to Clinical health, with all 13 relating to socio − cultural factors, factor 3 has six variables relating to household factor; factor 4 had 7 variables of which all related to Environmental, behavioural and social related factors; factor 5 had 10 variables all relating to community factor. Finally, factor six had 12 variables related to AIP management (dependent variable). The results of the rotation have been displayed in Table 5.

Table 5: Rotated Component Matrix for determinants of AIP

	Component					
	1	2	3	4	5	6
Factor 1 Clinical health						
Item 1	.680					
Item2	.832					
Item3	.982					
Item4	.648					
Item5	.757					
Factor 2: Socio-cultural						
Item6		.746				
Item8		.882				
Item9		.959				
Item10		.732				
Item11		.963				
Item12		.757				
Item13		.982				
Item15		.958				
Item16		.718				
Item18	.953					
Item19	.953					
Item20	.822					
Item22	.690					
Factor 3: Household						
Item23			.746			
Item24			.882			
Item25			.959			
Item26			.732			
Item27			.963			
Item28			.982			
Environmental, behavioural and social related factors (EBS)						
Item30				.958		
Item32				.953		
Item33				.953		
Item34				.982		
Item36				.832		
Item37				.982		

Item38	.648		
Community related factors			
Item40		.882	
Item41		.982	
Item43		.822	
Item44		.959	
Item45		.963	
Item46		.982	
Item47		.690	
Item48		.746	
Item49		.882	
Item50		.959	
AIP Management			
Item51			.982
Item52			.958
Item53			.953
Item54			.953
Item55			.982
Item56			.958
Item57			.982
Item58			.982
Item59			.982
Item60			.882
Item61			.959
Item62			.982

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Reliability of scale and sub – scale of determinants

According to Malhotra & Birks (20007), reliability simply refers to the extent to which measurement reproduces consistent results particularly if the process of measurement is to be repeated. Pallant (2003) confirms this position by positing that the essence of reliability is to check the scales used for analysis and ensure that all items that make up the scale "hang together", thus, are internally consistent. In this study therefore, the most commonly use indicator of internal consistency, Cronbach's alpha coefficient, was used to check the reliability of the scales. Both Pallant (2003) and Hair et al. (2010) agree that ideally, this value should be greater than 0.7 for managerial decisions although a threshold level of 0.6 could be used in exploratory research. The internal reliability of the six factors was analyzed through Cronbach's coefficient alpha. Only factors that meet the minimum value of 0.6 as postulated by (Hair et. al., 2010) were accepted; and for this study, all six factors met the required minimum value of 0.6. Also, in order to test the value of the variables that loaded onto the factors, item–to total correlation was set above 0.3 (Parasuraman et. al, 1988). As a result, the factors were re-specified to determine their conceptual fitness based on these two basic rules. Thus in all, 60 out of the original 62 variables became valid for exploratory factor analysis and the overall reliability index of 0.943 was achieved with the 60 variables of the constructs. The results are presented in Appendix D.

Research question 3: What effects do the determinants have on the management of anaemia in pregnancy?

The final research question analysed the effects of the determinants on management of AIP. The Table 7 shows the multiple regression output for the determinants' effect on management of AIP. The five determinants that is community, household, socio – cultural, EBS and clinical health perception has

a statistically significant relationship with effective AIP management (F − stats =310.497, Sig (P<0.05) =.000, S.E=.15647, Adjusted r squared = .818). The predicators such as community, household, socio − cultural, EBS and clinical health perception explained 82.0% of the variability in effective management of AIP (R − squared = 0.820). Therefore, the model shows a good fit for the data as indicated by the variance explained by the predicators and the established statistical relationship with the AIP management.

Table 7 shows that there were direct relationships between community factors, EBS and Clinical health perception with AIP management. However, there was inverse relationships socio − cultural factors and household factors with AIP management. Table 4.7 indicated that positive clinical health perception of respondents explained 84.9% the change seen AIP management (B (Unstandardized coefficient) = .849, Sig (P<0.05) = .000, S.E=.060). Further, Table 7 showed that community factors positively contributed 60.8% to AIP management (B=.608, Sig (P<0.05) = .007 S.E=.125). The final direct relationship established by the factors shows that environmental, behavioural and social factors affected AIP management by 25% (B=.25, Sig (P<0.05) = .001, S.E=.026). Household factors adversely affected AIP management by 37.2% (B=372, Sig (P<0.05) = 0.003, S.E=.049). It was also indicated from Table 7 that negative socio − cultural beliefs reduced AIP management by 24.1% (B=.241, Sig (P<0.05) = .000, S.E=.061)

Table 7: Multiple regression output

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	S. E	Beta		
(Constant)	.568	.125		4.558	.000
Community factors	.608	.060	.593	10.138	.007
Socio Cultural factors	-.241	.061	-.302	-3.969	.000
Household factors	-.372	.049	-.410	-7.557	.003
EBS factors	.25	.026	.223	9.615	.001
Clinical health	.849	.060	.907	14.065	.000
F − Stats	310.497				
Sig (P<0.05)	.000				
Std. Error of the Estimate	.15647				
R	.906				

R – Square	.820
Adjusted R Square	.818

a. Dependent Variable: AIP Management

b. Predictors: (Constant), Clinical health, Community, EBS, Household, Socio Cultural factors

4. Discussion

Anaemia in pregnancy is a widespread public health problem associated with an increased risk of morbidity and mortality. The current study was conducted in two of the central regional hospitals in Ghana to assess the perception of health staff regarding the management of anaemia during pregnancy. It was found that health professional respondents effectively managed moderate AIP and that overall management competence for moderate and severe AIP was high. There was an overall effective management perception among health staff. This finding supports Abdelhafez and El-Soadaa's (2012) study conducted in Saudi Arabia. It was proposed that competent anemia management is critical in the elimination of AIP. It was found that health staff perceived competence in the management of AIP correlated positively to the reduction of AIP. Therefore, with this current study, it was expected to establish such empirical findings from Abdelhafez and El-Soadaa (2012) and others such as Nadia, Diamond-Smith, Gupta, Kaur, and Kumar (2016); The Royal Women's Hospital (RWH) (2015); Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) (2013); and Bryant and Larsen (2009). In fact, looking into the significance of the study factors, it was revealed by the statistical analysis that the Bartlett test of Sphericity (Approx. Chi-square = 6348.277, df. 411, Sig. = 0.000) and the KMO measure of sampling adequacy (Value of.723) confirmed that there was significant correlation among environmental, behavioral, and social, socio-cultural, household, community, clinical health, and AIP management and, thus, a strong basis for the application of exploratory factor analysis. These factors corroborate what Nadia, Diamond-Smith, Gupta, Kaur, and Kumar (2016); RWH (2015); RANZCOG (2013); and Bryant and Larsen (2009).

Though studies cited above including Nadia, Diamond-Smith, Gupta, Kaur and Kumar (2016); RWH (2015); RANZCOG (2013); Bryant and Larsen (2009) found that the 62 variables were all inclusive to the factors, this current study found that 60 variables out of the 62 variables met the criteria that of the Eigen values being equal to or greater than 1 (Malhotra & Birks, 2007). In addition, the 60 variables had loadings of at least 0.5 and factors with a reliability threshold of 0.6 (Hair, Black, Babin, Anderson & Tatham, 2010). Further, it was indicated from the analysis that the 60 variables measuring environmental, behavioural and social, socio – cultural, household, community, clinical health and AIP management explained altogether a satisfactory 92.72% of the total variance. However, as shown in the study by Nadia, Diamond-Smith, Gupta, Kaur & Kumar (2016), these factors explained just 82.4% of the total variance. That of RWH (2015); RANZCOG (2013); and Bryant and Larsen (2009) found lower variance for the variables as compared to that of Nadia et al. (2016) study and this current study finding. However, Olubukola, Odunayo and Adesina (2011); Osungbade and Oladunjoye (2012); Abriha, Yesuf and Wassie (2014); Serbesa and Iffa (2018); Margwe and Lupindu (2018) and Kordorwu (2018) stated that variables such as food taboos and mode of abortion, family planning variables were not captured under the current 60 variables of the study. The implication was that this current study was able to capture most relevant variables that defined the factors influencing the management of AIP as done in previous study. Therefore, the findings would be able to be generalized to the overall population selected for this study. This current study indicated that community, household, socio – cultural, EBS and clinical health perception factors has a statistically significant relationship with effective AIP management. The predictors explained 82.0% of the variability in effective management of AIP. None

of the empirical studies such USAID (2011); Nadia et al. (2016); Fredanna, M'Cormack and Drolet (2012) reviewed analysed the effects of the predictors on AIP management.

There were direct relationships between community factors, EBS and Clinical health perception with AIP management. However, there was an inverse relationship between the constant and socio − cultural factors and household factors with AIP management. The report by USAID (2011) indicated that EBS factors were statistically significant and that environmental, behavioural and social factors had direct correlation with AIP management similar to the current findings of this study. The USAID (2011) did not empirically assess the effect but the correlations of EBS with AIP management. This implied that there was not just correlational relationships existing between these studied factors but they actually have statistically significant positive effect towards the management of AIP. Hence, environmental and cultural backgrounds of health professionals can significantly influence their management style of AIP. Also Fredanna, M'Cormack and Drolet (2012) found a correlation between behavioral factors and AIP management. In similar vein, magnitude of the effect of behavioral variables on AIP management was not found to be significant. The studies (USAID, 2011; Fredanna, M'Cormack & Drolet, 2012; Nadia et al., 2016) found that clinical health perception as having direct correlations to management of AIP. Though the reviewed studies (USAID, 2011; Fredanna, M'Cormack & Drolet, 2012; Nadia et al., 2016) did not find correlations among community factors and AIP management directly as done in this current study, but the reviewed studies combined the community factors under the environmental, behavioral and social factors. Therefore, it was assumed from the findings from (USAID, 2011; Fredanna, M'Cormack & Drolet, 2012; Nadia et al., 2016) that community factors had positive correlation with management of AIP, but such finding was be contrary to that of this current study.

It was found that positive clinical health perception of respondents explained 84.9% the change in AIP management and that of community factors positively contributed 60.8% to AIP management. These findings are contrary to the following studies (USAID, 2011; Fredanna, M'Cormack & Drolet, 2012; Nadia et al., 2016). However, this findings support the report from Ghana by USAID (2014) that clinical health beliefs significantly affects the management of AIP. Furthermore, there was direct relationship established that environmental, behavioural and social factors affected AIP management by 25% and that of household factors adversely affected AIP management by 37.2%. It was also found that negative socio − cultural beliefs reduced AIP management by 24.1%. From the studies conducted by Nadia, Diamond-Smith, Gupta, Kaur and Kumar (2016); RWH (2015); RANZCOG (2013); Bryant and Larsen (2009) there were inverse correlations were found between household factors and social cultural beliefs with management of AIP. However, it was established from the same studies, Nadia, Diamond-Smith, Gupta, Kaur and Kumar (2016); RWH (2015); RANZCOG (2013); Bryant and Larsen (2009) that environmental, behavioural and social factors measured per their studies had positive correlations with management of AIP. These studies Nadia, Diamond-Smith, Gupta, Kaur and Kumar (2016); RWH (2015); RANZCOG (2013); Bryant and Larsen (2009), were correlational studies and that the relationships from such studies did not meant causality as done in this current study. The findings of this current study was able to establish causality which has not be done by these previous studies such as Nadia, Diamond-Smith, Gupta, Kaur and Kumar (2016); RWH (2015); RANZCOG (2013); Bryant and Larsen (2009); USAID (2011); Fredanna, M'Cormack and Drolet (2012). In fact, these previous studies just examined the relationships between these variables or factors claiming that they may not necessarily and significantly affect the way health professionals manage AIP.

5. Conclusions

This study looked into health-care workers' perspectives on anaemia management during pregnancy. The level of knowledge possessed by the health staff was good and their competency in management was at an appreciable level. The study revealed that the first and foremost factor in effective management of anaemia in pregnancy is the clinical and health beliefs of the healthcare professionals. Followed by community-related factors and environmental, behavioral, and social factors.

There were adverse relationships established between household and socio-cultural factors influencing health staff and management of anemia in pregnancy. The conceptual framework predicted positive correlations between the five determinants, including community, household, behavioral, clinical health beliefs, and socio-cultural related factors. However, the findings indicated that three of the factors, including community, clinical health beliefs, and behavioral factors, were directly related to the management of anaemia in pregnancy. Of course, the empirical literature predicted a positive relationship between community and household factors and pregnancy anemia management. But the findings of this study were contrary to such a discovery in the literature. It is not surprising that the majority of the reviewed empirical literature combined community and behavioral factors as a single index to assess the effectiveness of anaemia management in pregnancy. Within this current study, such factors were separated and assessed for the management of anemia in pregnancy. Community factors correlated negatively, but behavioral and social factors had a direct relationship with anemia management.

It can be reflected that clinical and health beliefs of health staff significantly influence the management of anaemia in pregnancy and that with a negatively skewed perception of health staff, it was expected that anaemia in pregnancy management would be adversely affected. Indeed, environmental, behavioral, and social factors demonstrate a significant understanding of the individual and her social environment to be critical to anemia care delivery on the part of health staff. Noteworthy is that community factors influence the management of AIP. The findings show that this factor was of ultimate importance as it reinforces the behavioral disposition of the health staff in the management of this pregnancy-related problem. The findings show some contrary discoveries to some of the notable studies conducted, especially the community factors, behavioural and household factors, which were revealed in the empirical literature to have adverse effects on the management of AIP.

6. Confidentiality and anonymity

The highest level of confidentiality was maintained. All responses were kept confidential and anonymous. Participants were assured of strict anonymity and confidentiality on any information they gave during the research.

7. Risk and benefits

The anticipated risk to participants may include the provision of private information. The benefits of participation may not be immediately seen, the research findings will go a long way to improve effectiveness in the management of AIP in health facilities in the selected districts and elsewhere. The front-line health professionals and the service user's wasnefit from an improved health service system.

8. Right to withdrawal

Participants have the right not to take part in the study if they do not wish to. They may also stop participating in the interview at any time they choose without giving any reason.

9. Data protection

Information that was collected about participants during this research was stored safely and no one but the principal investigator was able to see it. The information about participants will have a numbers on it instead of the names and data collected was stored under lock and key.

10. Conflict of interest

The principal investigator is an Anaesthetist at Twifo Praso Hospital. The position of the principal investigator will not influence the outcome of this research in any way.

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