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Levels of Practices and Influencing Factors on the Use of Partograph on Provision of Health care among Nurses in Singida Municipality, Tanzania

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Abstract:-

Background: Partograph is the tool which is used to assess maternal condition, fetal condition contractions and progress of labour. As the result, well filled partograph helps the obstetric care provider to know any abnormal changes and decide better decisions during delivery of health care to the pregnant mother in labour which can help to reduce maternal and fetal morbidity and mortality rate. Therefore, the aim of this study was to determine the level of practices and elements influencing partograph use among nurses during providing health care in Singida Municipality, Singida region - Tanzania.

Methods: Analytical cross sectional study was conducted at Singida Municipality and involved 150 nurses who were randomly selected from maternity departments at Sokoine health center and Singida Regional Referral Hospital in Singida municipality, Tanzania. A practice and associated factors on partograph utilization self-administered structured questionnaire was used to examine the levels of practices and factors influencing partograph usage on provision of health care. Chi-square test, binary logistic regression and multinomial logistic regression were used to test association and pinpoint significant predictors of level of practice and associated factors on partograph utilization.

Results: Findings indicate that out of 150 nurse midwives only 58(38.7%) of the study participants had high level of practice on the application of partograph during delivery of health care. Nurses who got the university education 35(83.3%) and nurse and midwife officers 36(81.8%) had high level of practice on partograph usage compared to assistants nurse officers and enrolled nurses 37(57.8%) and 25(59.5%) respectively. However, after control of the extraneous factors, nurses who reached at university level were more than sixteen times likely to have a good practice on usage of partograph charts (AOR=16.757; 95%CI: 6.394; 43.915; p = 0.000) and nurses and midwives officers were more than eight times likely to have a good practice on partograph utilization on delivery of health care (AOR=8.323; p = 0.004; 95%CI: 0.098; 0.642).

Conclusion: The overall levels of practices on partograph utilization were low. The study uncovered that education level and professional qualification were the main factors influencing usage of partograph during provision of health care in Singida municipality, Singida region-Tanzania. Therefore on job training and workshop should be among of deliberate efforts to ensure good utilization of partograph during provision of health care so as to reduce maternal complications, mortality and fetal deaths in Tanzania.

Keywords:- *practices, utilization, partograph, nurses, health care and Singida.*

I. INTRODUCTION

Worldwide pregnant women suffer a lot during the perinatal period and those who die due to pregnancy-induced complications were estimated to be 303,000 deaths yielding a maternal mortality ratio (MMR) of 2016 deaths per 100,000 live births (1). World Health Organization report shows that these deaths decreased worldwide to estimate of 44 percent from 1990 to 2015 (2). Here the WHO report estimated that approximately 99%(302,000) of maternal mortality occurred in developing countries, whereas Sub-Saharan countries is about 66%(201,000) of these deaths (1).

Moreover, data depicts that developing countries have high magnitude of maternal deaths. For instance African countries account 179 000 (62%) of global deaths and southern part of Asia account 69 000(24%) maternal mortality (3). “The African countries still face the same problem because studies done by (4) data showed that maternal complications were estimated to be 0.34% and neonatal deaths approximated to be 2.1% in Rwanda. Data uncovered that 36.6% of health care providers were not trained on labour management by using partograph during delivery of health care”(5). More often, maternal morbidity, mortality and complications are associated with prolonged

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and obstructed labor. Prolonged and obstructed labors are the main causes of maternal and newborn morbidity and mortality in the developing countries including Tanzania(6).

Therefore, this problem can be prevented by accessing skilled delivery services such as plotting partograph during the progress of labour. "The well-plotted data allow the nurse to recognize any abnormal conditions earlier and decide to employ proper actions to the particular pregnant mother in labour pain during the delivery of nursing care" It was insisted by (1). Partograph is a standard instrument which is used to monitor labor, contractions, fetal and maternal wellbeing and when is utilized properly, it helps to reduce prolonged and obstructed labor, which is estimated to cause 8% of maternal mortality globally. Therefore, it is used as an 'primary caution indicator' and helps in early judgment making(6–9).

"Utilization of partograph was initiated in 1972 for monitoring progress of labour in order to reduce maternal complications and mortality and later on in 1988 was modified and initiated to be used globally in the health care setting for labour monitoring and management in order to prevent prolonged and obstructed labour which is the major cause of maternal and prenatal mortality and morbidity in developing countries including Tanzania(8,9)" Philpott and Castle reported. The woman who end up with obstructed or prolonged labour is prone to postpartum sepsis, uterine rupture, postpartum hemorrhage and obstetric fistula (6,7,9,10). Therefore, anticipation of prolonged labour and obstructed labour by proper utilization of partograph charts is important actions for reducing maternal complications and fetal morbidity and mortality (6–8,11,12).

To reduce maternal complications and fetal morbidity and mortality due to prolonged and obstructed labour in African countries including Tanzania, the World Health Organization (WHO) declared worldwide use and routine partograph usage during maternal and fetal condition as well as progress of labour in order to reduce both maternal and fetal mortality worldwide(5–9,11–14). Studies have uncovered that using partograph for monitoring labour is significant strategy in reducing maternal complications and mortality resulted from prolonged and obstructed labour(8).

Despite the recommendations from World Health Organization (WHO) and the great importance of the partograph utilization on monitoring contractions, fetal status and maternal conditions in all health facilities daily in order to reduce obstructed and prolonged labour but it is not commonly used in various countries as it should be to help early decision making due to different factors (8,11,14,15). Findings from selected developing countries have depicted that the partograph use is very low in spite of being simple and expensive tool which can be used for intrapartum monitoring of labour(5,8,10,11,15,16). Likewise, study which was done at Muhimbili Hospital, Dar es Salaam-Tanzania reported poor practice on partograph use because many parameters were not correctly filled(16)

Different studies conducted in developing countries depicted that there is a gap between elements affecting utilization of partograph during provision of health care such as level of knowledge, lack of ongoing training, close supervision, attitude, type of profession, number of health professionals per shift and institution policy cause ineffective utilization of partograph (6,8,10,11,13–19). Besides, the level of practices and elements influencing partograph use among health care takers has not been studied yet in Singida Municipality, Singida region. Therefore, the aim of this study was to determine the level of practices and elements influencing partograph use among nurses during providing health care in Singida Municipality, Singida region.

II. METHODS

A. Study design and Setting

The analytical cross sectional study with a quantitative approach was done since January to June 2020 in Singida Municipality, Tanzania. Basing on august 26, 2012 national census, Singida municipality had a population of 150,379 (Males = 73, 484, Females = 76,895) with density of 208.7/km^2 from 721km^2 total area of the municipality. Health facilities found in Singida municipality are both private and public health facilities. This research was done at Singida regional referral hospital and Sokoine Health center found in Singida Municipality, Tanzania.

B. Study population

The population under study was 150 nurses who were working in maternity departments in Singida municipality who consented to participate in the study.

C. Data collection tools

A pre-tested and closed ended self-administered questionnaire was employed for data gathering. Several appropriate writings were revised to make a tool that suited to address the objectives of this study (9, 11–15). The written in English version was translated to Swahili language and retranslated to English to cross check uniformity by expert. The tool was pretested to 30 nurses who were working in maternity departments from other health institutions which were not involved in this study. They were put into different rooms to guarantee disclosure and secrecy during the filling process of questionnaires by a researcher. Discoveries from the pre-test were used to revise the tool in terms of rectifying the queries in order to avoid methodological errors. This questionnaire was composed to get facts on the demographic data and professional elements of health care personnel's and practice of utilization of partograph. Levels of practice on partograph utilization were measured by using ten practice questions. In order to create a more unbiased examination of levels of practice on partograph utilization a scoring technique was formulated and a practice total score for each participant was gotten by summing up the score for right responses given to the chosen questions in the questionnaire. A score above (≥5) to these questions were considered as high levels of practice on partograph use.

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D. Sample Size and Sampling Technique

The sample was computed by using the formula as structured by Fisher in 1965, $n=(Z^2P(1-P))/E^2$ Where, Z is the Z value for the confidence level of 95%, d is the standard error of 5%, pis the value for the extent of 26.6% (20). Finite population correction for proportion was adopted from reviewed literature (13) as nf = n/(1+ n/N) where; nf= Desired sample size, n= Computed sample size and N= approximated population in the area under study. Subsequently, the sample size was increased by 10% of study dropouts which gave a total of 150.

Singida region was purposively selected to be the area understudy in Tanzania. One district (Singida urban) was selected by simple random sampling from the seven districts of Singida Region. Three staged multi-stage cluster sampling technique was used to obtain study participants. In first stage random sampling, all wards (16 wards) in Singida urban (municipality) were listed and by the use of purposive random sampling three wards (Ipembe, Mandewa, and Misuna) were picked since are the only wards with two big health facilities in Singida municipality with maternity departments.

During second stage sampling two health facilities (Singida Region Referral Hospital and Sokoine Health Center) were conveniently selected from six health facilities because had large number of nurses compared to other health facilities found in Singida municipality working at maternity departments. The third stage sampling was simple random sampling technique used to recruit study participants. At each health facility nurses were interviewed for working experience, those who were worked for at least six months and consented to participate in the study were enrolled.

E. Data analysis

The data analysis employed both descriptive and inferential statistical analysis. Descriptive data analysis was used to determine frequencies and percentages of Socio-demographic characteristics of the study respondents. Chi-square and cross-tabulation were adopted to determine the association between categorical variables. Inferential data analysis served to determine the extent of association between variables. A confidence interval (CI) was set at 95% with a significance level of 5%. Statistical Package for Social Sciences (SPSS) software program version 23 was used for data entry, processing, and analysis. Findings were presented in tables by frequencies (n), percentages (%), Odds Ratio (OR), Adjusted Odds Ratio (ARO), and p-values at 95%CI of demonstrating significance relationship and or association between variables. Hence, variables that revealed significant association at ($p \leq 0.05$) were recognized as independent predictors which influence partograph utilization.

III. RESULTS

A. Socio-demographic Features of the Study Participants

Findings revealed that most of the study respondents' ages ranged from 20 to 32 years which was 103(68.7%). However, study discoveries showed that most of the participants 88(58.7%) were female and 93(62%) were married. The mean age group was 26 years and 103(68.7%) fall within the age group of 20-32 years. The study participants 106(71.3%) reached at the college level while 44(28.7%) attained the University education. So far, 64(42.7%) were assistant nurse officers (diploma holders), 44(29.3%) were nurse and midwife officers, and 42(28%) had a certificate in nursing. Other findings were found as portrayed in table 1.

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Variables	n	%
Age Group		
20-32	103	68.7
33-45	32	21.3
46-58	15	10.0
Gender		
Male	62	41.3
Female	88	58.7
Marital Status		
Single	54	36.0
Married	93	62.0
Widow	2	1.3
Widower	1	0.7
Religion		
Muslim	37	24.7
Christian	112	74.7
Others	1	0.6
Level of Education Attained		
College	106	71.3
University	44	28.7
Professional Qualifications		
Nurse and midwife officers	44	29.3
Assistant nurse officer	64	42.7
Enrolled nurse	42	28.0
Residence		
Urban	68	45.3
Semi-urban	82	54.7
Working Health Facility		
Health center	58	38.7
Hospital	92	61.3

Table 1: Socio-demographic features of study participants (n = 150)

Source: Field Data (2020)

B. Levels of Practice on the Use of Partograph among nurses

The results uncovered that majority of the study participants 92(61.3%) had poor practice on the use of partograph and only 58(38.7%) study participants had an extraordinary level of practice on the use of partograph in Singida Municipality.

Variables	n	%
Level of practice		
Low practice	92	61.3
High practice		
Total	58	38.7
	150	100

Table 2**:** Levels of practice on partograph use among nurses (n = 150)**.**

Source: Field Data (2020)

C. Association between Features Influencing levels of Practice of Partograph Use and Level of Practice

Study findings depicted that there is a significant association between age group and levels of practice on utilization of partograph ($p = 0.024$; $X^2 = 7.427$). Also, study participants whose age were within the age group of 20 to 32 years, 47(46.1%) had an extraordinary level of practice on partograph utilization during delivery of health care compared to other age groups. Study participants who got the university education 35(83.3%) had an extraordinary level of practice whereas only 7(16.7%) had poor practice on partograph utilization during delivery of health care compared to other study participants' educational levels. The findings shown that there is a significant association between educational levels and practice on partograph utilization ($p = 0.000$; $X^2 = 49.704$).

In addition, findings depicted that there is a significant association between professional qualifications and levels of practice on the partograph utilization among nurses during provision of health care ($p = 0.000$; $X^2 = 49.835$). The study participants who were nurse and midwife officers 36(81.8%)

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had an extraordinary practice and only 8(18.2%) had poor practice on partograph utilization. Also, majority of the assistant nurse officers 51(79.7%) and enrolled nurses 33(78.6%) had poor practice on the partograph use.

Furthermore; findings shown that among 82 study participants living in semi-urban only 39(47.6%) had an extraordinary practice while 43(52.4%) had poor practice on partograph utilization during provision of health care compared with those living in urban areas. The results depicted significant association between residence and levels of practice on partograph utilization in Singida municipality ($p = 0.014$; $X^2 = 6.034$).

On other hand, It was obvious that gender had an effect on the levels of practice on partograph utilization among nurses as the outcomes revealed that 30(48.4%) males had an extraordinary practice on partograph utilization during provision of health care compared to women where only 28(31.8%) had an extraordinary practice on the partograph utilization. Findings discovered that there is a statistical significance between gender and levels of practice on partograph utilization among nurse ($p = 0.040$; $X^2 = 4.211$). Further results were found as presented in table 3.

Variables	Levels of practice		X^2 P-Value
	Low practice	High practice	
Age Category			
20 to 32yrs	55(53.9%)	47(46.1%)	
33 to 45yrs	25(78.1%)	7(21.9%)	X^2=7.427
46 to 58yrs	12(75.0%)	4(25.0%)	P=0.024
Gender			
Male	32(51.6%)	30(48.4%)	X^2=4.211
Female	60(68.2%)	28(31.8%)	P=0.040
Religion			
Muslim	24(64.9%)	13(35.1%)	
Christian	68(60.7%)	44(39.3%)	X^2=1.799
Others	0(0.00%)	1(100.0%)	P=0.407
Marital Status			
Single	28(51.9%)	26(48.1%)	
Married	61(65.6%)	32(34.4%)	
Widow	2(100.0%)	0(0.00%)	X^2=4.649
Widower	1(100.0%)	0(0.00%)	P=0.199
Education Level			
College	85(78.7%)	23(21.3%)	X^2=49.074
University	7(16.7%)	35(83.3%)	P=0.000
Professional Qualifications			
Nurse & midwife officers	8 (18.2%)	36(81.8%)	
Assistant nurse officer	51(79.7%)	13(20.3%)	X^2=49.835
Enrolled nurse	33(78.6%)	9(21.4%)	P=0.000
Residence			
Urban	49(72.1%)	19(27.9%)	X^2=6.034
Semi-Urban	43(52.4%)	39(47.6%)	P=0.014
Working Health Facility			
Health center	39(67.2%)	19(32.8%)	X^2=1.392
Hospital	53(57.6%)	39(42.4%)	P=0.238

Table 3: The association between factors influencing the levels of practice on partograph use and the level of practice (n = 150).

D. Association between Factors Influencing Levels of Practice on Partograph Utilization

After controlling the confounders, the study participants who were degree holders in general nursing and midwifery were more than eighteen times likely to have an extraordinary practice on partograph use than other lower educational levels (OR=18.478, p = 0.001, 95%CI: 7.268; 46.981). In combination with other elements the power was adjusted to be more than sixteen times likely to have an extraordinary practice on partograph use than the lower educational levels (AOR=16.757, p=0.001; 95%CI: 6.394; 43.915). Furthermore, when controlling other extraneous factors the study participants who were nurses and midwives officer were more than seven times likely to have an extraordinary practice on partograph utilization than assistant nurse officers and enrolled nurses (OR=7.568, p = 0.006, 95%CI: 0.117; 0.697). After combining with other factors the power was adjusted to be more than eight times likely to have an extraordinary high practice on partograph utilization than the lower proficient qualifications (AOR=8.323; p = 0.004; 95%CI: 0.098; 0.642). Other findings are shown in table 4.

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(n = 150).

Variable	OR	p-value	95%CI		AOR	p-value	95%CI	
			Low	High			Low	High
Gender								
Male **(Ref)**								
Female	0.498	0.041	0.255	0.973	1.056	0.900	0.451	2.47
Education Level								
College **(Ref)**								
University	18.478	0.000	7.268	46.981	16.757	0.000	6.394	43.915
Residence								
Urban **(Ref)**								
Semi-urban	2.339	0.015	1.180	4.657	1.485	0.351	0.647	3.407
Age Category								
20-32years	0.390	0.123	0.118	1.391	1.154	0.826	0.32	4.16
33-45years	1.190	0.808	0.291	4.867	1.905	0.396	0.430	8.447
46-58years **(Ref)**								
Professional Qualifications								
Nurse and midwife officer	7.568	0.006	0.117	0.697	8.323	0.004	0.098	0.642
Assistant nurse officer	0.031	0.861	0.422	2.055	0.014	0.905	0.428	2.120
Enrolled nurses **(Ref)**								

Table 4: Logistics regression analysis of the association between factors influencing partograph use and levels of practice

Source: Field data (2020)

IV. DISCUSSION

A. Levels of practice and factors influencing partograph use

The findings found that majority of the study participants 92(61.3%) had poor practice on utilization of partograph on provision of health care in Singida municipality. This shows that there is a gap between knowledge which they acquired about the utilization of partograph in learning institutions or seminars and practice for examining contractions and the progress of labour.

Similarly, these findings are not so new because they match with those found by Tesfay Hailu, Kidane Nigus, Gebreamlak Gidey, Birhane Hailu & Yohannes Moges (8), Carlson Babila Sama, Noah F. Takah, Valery K. DanweUzeru, Forchu Melo, Therence Nwana Dingana & Fru F. Angwafo (21), Oliva Bazirete, Nomafrench Mbombo & Oluyinka Adejumo (5), Chrispin Mandiwa, Collins Zamawe (7), Solomon Weldemariam Gebrehiwot, Mulugeta Woldu Abrha & Haftom Gebrehiwot Weldearegay (22), Margaret M Opiah, Abosede Bola Ofi, Ekere James Essien& Emmanuel Monjok (23), Kidist Eshetu, Emebet Hussen & DubaleDulla (15), Githae CN, Mbisi A &Boraya JO (13) and John Mukisa, Isha Grant, Jonathan Magala, Andrew S. Ssemata, Patrick Z. Lumala & Josaphat Byamugisha (11) whereas, majority of study participants had a low level of partograph utilization.

The similarities of findings between these studies would probably be due to education level, professional qualifications and study participants involved in previous studies were both midwives and nurses by profession which is similar to the participants of the current study. Low level of partograph utilization in this study may have resulted in delayed detection and undertaking of appropriate intervention leading to high maternal and fetal morbidity and mortality in Singida. However, these findings do not line up with those found by Tesfay Hailu, Kidane Nigus, Gebreamlak Gidey, Birhane Hailu & Yohannes Moges (9), Azeb Abrham Hagos, Eshetu Cherinet Teka & Genet Degu (6). The mismatch between these findings would probably be due to the fact that they were knowledgeable, close supervisions, monitoring and they received training on partograph utilization.

Education of university level was significant predictor of a nurse's practice on partograph utilization. These findings are consistent with those found by Tesfay Hailu, Kidane Nigus, Gebreamlak Gidey, Birhane Hailu & Yohannes Moges (9) and Desalegne Amare Zelellw, Teketo Kassaw Tegegne (1). The similarities of the findings would probably be due to that the participants who are degree holder are knowledgeable and have positive attitude on partograph utilization. However, these findings mismatch with those found by Yosef Haile, Fikru Tafese, Tesfaye Dagne Weldemarium & Mulugeta Hailu (8), Kidist Eshetu, Emebet Hussen & Dubale Dulla (15) and Githae CN, Mbisi A and Boraya JO (13). The probable reasons behind to be explained would be due to working experience, on job training and working health facilities which influence levels of practice on partograph utilization.

Moreover, the results of this study revealed that profession qualification was significant predictor of a nurse's practice on partograph utilization. These findings line up with those found by Haymanot Mezmur, Agumasie Semahegn & Balewgizie Sileshi Tegegne (10) and Desalegne Amare Zelellw & Teketo Kassaw Tegegne (1). This would be due to that the nurse and midwives officers were familiar and skillful enough on partograph utilization. However, these findings mismatch with those found by Tesfay Hailu, Kidane Nigus, Gebreamlak Gidey, Birhane Hailu& Yohannes Moges (9)

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V. LIMITATIONS

It is difficult to establish the cause – effect relationship and the findings cannot be generalized to Tanzania country wise because the study was done in Singida Municipality. Therefore large study should be done in order to cross check the use of partograph in Tanzania.

VI. CONCLUSION

The overall level of practice on partograph utilization was low and it uncovered that education level and professional qualification were the main factors influencing practice on partograph use during provision of health care in Singida municipality, Tanzania. Therefore on job training and workshop should be among of deliberate efforts to ensure good utilization of partograph during provision of health care so as to reduce maternal complications, mortality and fetal deaths in Tanzania.

- **List of Abbreviations**
  - HESLB: Higher Education Students' Loans Board
  - MMR: Maternal mortality ratio
  - SRRH: Singida Regional Referral Hospital
  - UDOM: University of Dodoma
  - WHO: World Health Organization

DECLARATIONS

- **Ethical Approve and Consent for Participation:** The Ethical clearance approval for conducting this study was given by Ethical the University of Dodoma, Institution Research Review Committee, Municipal Director, Regional Medical Officer, District Medical Officer, and Hospital Medical in charges. Written informed consent was asked from every study respondent. Privacy and secrecy were assured as well as autonomy was observed clearly for the reason that neither the study participants' names nor the health facilities involved were written on the questionnaire.
- **Consent for Publication:** Not applicable
- **Availability of Data and Material:** The data sets are available and on reasonable need can be provided by the corresponding author.
- **Competing Interests:** They don't have competing interest
- **Funding:** They don't have any financial relationship related to the manuscript disclosure
- **Authors' Contributions:** D. P. initiated the study and contributed much to study design, data collection, and data analysis. W. M and A. J contributed on close monitoring and directing the conceptualization of the study, an in-depth review of the study design, data analysis, and manuscript development. All authors approved the submission of the final manuscript.

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