

Provision of Preconception Care by Midwives, Nurses and Doctors at Ndola Teaching Hospital in Ndola District, Zambia

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Abstract

Background: The goal of preconception care is to improve the outcome of a mother's pregnancy and childbirth. Nevertheless, in most developing nations; Zambia included, there are still issues with implementation of preconception care. Therefore, the aim of this study was to establish the provision of preconception care by midwives, nurses and doctors at Ndola Teaching Hospital in Zambia. **Methods:** A concurrent embedded mixed methodology utilising a descriptive explorative study design, where 107 respondents were randomly selected using the lottery technique for quantitative part and two focused group discussions for qualitative part of the study was used. A self-administered questionnaire was used to collect quantitative data and a focus group discussion guide was used for the focus group discussions. Statistical Package of Social Sciences version 26 with significance set at 0.05 and at 95% confidence level and thematic analysis were used for data analysis. **Results:** 75% of the respondents in this study were not providing preconception care and only 25% of respondents were providing preconception care; however, this was provided randomly because there were no guidelines to follow. Among the respondents, 81.3% had medium knowledge, 70.1% had good practices and 92.5% had positive attitudes towards preconception care. Further analysis showed that the association between preconception care and knowledge, practices and attitudes was not statistically significant ($p =$ values 0.336; 0.344; 1.000 respectively). Multivariate logistic regression revealed that participants with high knowledge were five times more likely to provide preconception care (OR = 5.00, CI = 0.42 - 59.7, $P = 0.203$). Generally, all the participants acknowledged that preconception care was an important package that could prevent maternal and child morbidities and mortalities. **Conclusions:** The study revealed that most of the respondents were not providing

preconception care. Provision of preconception was done by a small fraction of the respondents and it was done in an unorderedly manner due to lack of set standards and guidelines. Despite medium levels of knowledge and generally good practices and positive attitudes towards preconception care, its random provision indicates a need for established standards to enhance maternal and child health outcomes.

Keywords

Preconception Care, Provision, Knowledge, Practice, Attitude

1. Introduction

Preconception care is the provision of biomedical, behavioural and social health interventions to women and couples before conception occurs [1]. Its ultimate aim is to improve women and couples' health statuses, and reduce behavioural, individual and environmental factors that contribute to poor maternal and child health outcomes, in both the short and long term [1]. In 2012, the World Health Organisation (WHO) organised a meeting to develop global consensus on preconception care, aimed to reduce maternal and childhood morbidity and mortality [1]. Arising from the meeting, a list of programmes such as tobacco use prevention and cessation, nutrition, vaccine, fertility and infertility, female genital mutilation, human immunodeficiency virus (HIV) testing and counselling, mental health, substance use, intimate partner and sexual violence, premarital counselling, genetic counselling, Maternal and Child Health (MCH), adolescent friendly services, and occupational health were included in preconception care [1]. Zambia being a signatory to the WHO, is supposed to provide the preconception care components as outlined by the WHO. In this vain Ndola Teaching Hospital being a tertiary hospital which provides various services like internal medicine, general surgery, obstetrics and gynaecology, ear, nose and throat, eye, dental and psychiatry care services grants the healthcare providers with an opportunity to provide preconception care.

Although the WHO [1] preconception consensus meeting report does not specify the health care workers who are mandated to provide preconception care; analysing the package and ultimate aim of the care from the Zambian perspective, the health care workers who are able to provide the service are midwives, nurses and doctors. This is because the training curricula of these professionals include provision of preconception care [2]. However, despite the inclusion of preconception care in their curricula, it is unclear if the mentioned healthcare providers are providing the service or not. What is acknowledged however, is that midwives, nurses and doctors come in contact with women of reproductive age who require preconception care as they carry out contraception consultations or whilst undertaking cervical screening, during postnatal review, or when seeing adolescents in schools [3].

Ideally, preconception care is supposed to be provided as a stand-alone service in the maternity care package, just like antenatal, intrapartum and postnatal care [1]. Nevertheless, in Zambia, preconception has been incorporated in the 1,000 critical first days of life, child health and adolescent health [4]. According to the Ministry of Health (MoH) [5], Zambia should improve micronutrient supplementation in pre-pregnancy by integrating with family planning and other sexual and reproductive health (SRH) services; and preconception care is one of the SRH services. Currently in Zambia, the closest services to preconception care that are offered are family planning and antenatal care. Conversely, both family planning and antenatal care are inadequate as far as provision of preconception care is concerned. The shortfall in antenatal care is that even if a woman books as early as possible she would be seeing a healthcare provider when she is already pregnant; hence, depriving the health care provider the opportunity to ascertain her suitability to conceive; thereby, underplaying the importance of the critical time of embryonic development, which occurs before a woman realises that she is pregnant. Additionally, although family planning clinics provide a great opportunity to offer preconception care, the mind-sets of majority of clients attending the clinics is on avoiding or spacing of children and not conceiving.

Preconception care has been acknowledged as an intervention for the reduction of perinatal morbidity and mortality [6] because it minimises the risk factors for adverse embryonic growth and development before conception [6]. Thus, preconception care services to women and couples before and between pregnancies improve the chances of mothers and babies being healthy [7]. The magnitude of adverse birth outcomes such as antepartum haemorrhage (APH), postpartum haemorrhage (PPH), premature rupture of membrane (PROM), pregnancy induced hypertension (PIH), anaemia, low birth weight, still birth, preterm delivery, and multiple birth defects can be minimised by effective preconception care [8]. Ndola district in Zambia had been recording maternal deaths of above 30 women per year from 2017 to 2020 [9]. The most common causes of these maternal deaths are intrapartum and postpartum obstetric complications of haemorrhage, hypertensive disorders and non-obstetric complications, such as anaemia [9]. An interesting aspect of the maternal death is that majority of the women involved in the deaths attended antenatal care [10]. This aspect points to a lack of preconception care; which is care that can enable identification of factors that could predispose women to obstetric complications before they get pregnant. It is unclear whether this care is provided, and if it is provided, how, where and when is it provided. Therefore, this study sought to establish the provision of preconception care by midwives, nurses and doctors at Ndola Teaching Hospital.

2. Material and Methods

A concurrent embedded mixed methodology utilising a descriptive explorative study design was conducted and data were collected between 1st October and 31st December, 2022. Participants comprised 107 midwives, nurses and doctors work-

ing at Ndola Teaching Hospital in Copperbelt Province of Zambia. The sample size was arrived at by using Krejcie and Morgan [11] formula for finite population.

Purposive sampling was used to select Ndola Teaching Hospital on the basis that it is the largest tertiary hospital in the Copperbelt province of Zambia, and offers services such as internal medicine, general surgery, obstetrics and gynaecology, ear, nose and throat, eye, dental and psychiatry care services. Total enumeration of nurses, midwives and doctors were done, from which simple random sampling method using lottery technique was used to select the study participants. Data were collected from willing participants using self-administered questionnaires and two focused group discussions (FGDs). Data were analysed using Statistical Package of Social Sciences (SPSS) version 26 and thematic analysis.

2.1. Subjects & Selection Method

Simple random sampling method using lottery technique was used to select the study participants for the quantitative component. Responses of yes and no were written on pieces of paper that were folded and placed in a bowl. These were shuffled and each participant was asked to pick one piece. Those that picked papers written yes were included in the study. Purposive sampling was used for the qualitative component of the study. To select the participants for FGD the researcher considered the characteristics of the respondents and selected two groups having 10 participants each from among the 107 sample size. The characteristics used included those who had been in service for more than five years, the midwives and nurse in charges and doctors in charge of the various firms. Thereafter, the researcher used lottery technique to select the actual FGD participants.

Inclusion criteria: Midwives, nurses and doctors who were on duty in the OPD, gynaecology and postnatal wards at Ndola Teaching Hospital during the time of data collection and were willing to take part in the study.

Exclusion criteria: Midwives, nurses and doctors who were attending to emergency situations during the time of data collection.

2.2. Procedure Methodology

The researcher started each data collection by introducing herself and gave out information sheet for an in-depth information of the study. Participants were then asked to sign the consent form thereafter given a questionnaire to fill in and focus group discussions commenced.

2.3. Statistical analysis

Data were analysed using SPSS software version 26. Given that all variables were categorical, frequencies and percentages were reported. Chi square and Fishers exact tests were used to test for associations between variables at 95% confidence level and p-value of <0.05. Thematic analysis approach was used to analyse qualitative data. The six steps of thematic analysis included (a) reading through

the data several times to enable immersion; (b) producing initial codes from the data; (c) sorting different codes to form themes; (d) reviewing and refining themes; (e) defining and naming themes; (f) producing a report using data extracts in a concise, coherent, logical way.

3. Ethical Consideration

The approval to conduct the study was obtained from University of Zambia Research Ethics Committee (REF. 3072-2022) and National Health Research Authority (NHRA). Informed consent was sought from each study participant prior to enrolment. Respondents and participants were informed about their rights to withdraw at any time during the course of the study if desired, and assured that their decision could not affect their work in any way. Information obtained during the study was treated with utmost confidentiality.

4. Results

The presentation and analysis of findings are presented in two separate categories; quantitative component and qualitative component. The quantitative findings focused on the respondents' socio-demographic characteristics, provision of preconception care, knowledge, practices and attitudes towards preconception. The qualitative findings are presented through themes and subthemes and the exact statements of the participants.

4.1. Quantitative Findings

4.1.1. Socio-Demographic Characteristics of Respondents

Table 1 shows that 31.8% (34) of the respondents were aged between 20 and 25 years and 78 (72.9%) were females. Slightly over half, 57% (61) of the respondents were married and 52.4% (55) attained college education. Majority of the respondents, 93.4% (100) were Christians. Nurses, 35.5% (38) and midwives, 34.6% (37) made the most of the respondents, and 57.9% (62) had been in service for over five years.

Table 1. Respondent's socio-demographic characteristics (n = 107).

Characteristic	Category	Frequency (n)	Percentage (%)
Age group	20 - 25 years	34	31.8
	26 - 30 years	11	10.3
	31 - 35 years	14	13.1
	≥ 36 years	10	9.3
	Total	107	100
Gender	Male	29	27.1
	Female	78	72.9
	Total	107	100.0

Continued

	Unmarried	46	43.0
Marital status	Married	61	57.0
	Total	107	100.0
	<hr/>		
Level of education	College	55	52.4
	University	52	48.6
	Total	107	100.0
<hr/>			
Religious affiliation	Christianity	100	93.5
	Islam	7	6.5
	Total	107	100.0
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Length of Service	Under 1 year	1	0.9
	1 - 2 years	14	13.1
	2 - 5 years	30	28.0
	Over 5 years	62	57.9
	Total	107	100.0
<hr/>			
Profession	Nurse	38	35.5
	Midwife	37	34.6
	Doctor	32	29.9
	Total	107	100.0

4.1.2. Provision of Preconception Care

As shown in **Figure 1**, only 25% (27) of the respondents were providing preconception care, whereas, three quarters, 75% (80) were not providing preconception care.

4.1.3. Knowledge of Preconception Care

Table 2(a) shows that 88.8% (95) of the respondents correctly defined preconception care, while 11.2% (12) did not know the definition of preconception care. Only 11.2% (12) mentioned five components of preconception care, whereas 29% (31) could not mention any component of preconception care; 26.2% (28) were able to mention five benefits of preconception care and 94.4% (101) considered preconception as a doctors, nurses and midwives' responsibility; and 33.6% (36) indicated that preconception care should be provided as routine care.

According to **Table 2(b)**, 94.4% (101) of the respondents had never attended a workshop on preconception care; 77.6% (83) were of the view that preconception care should not be offered to high-risk women only; 82.2% (88) indicated that preconception care can reduce unplanned and unwanted pregnancies; and 95.3% (102) said that preconception care can reduce maternal and child mortality.

As shown in **Figure 2**, 81.3% (87) had medium level of knowledge on preconception care, whereas, 10.3% (11) had low knowledge on preconception care.

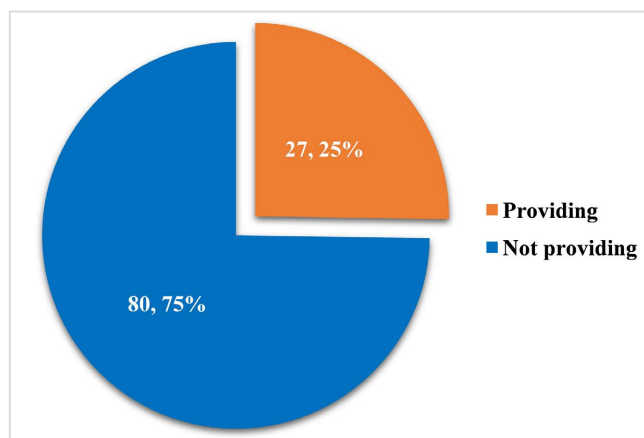


Figure 1. Provision of preconception care among respondents (n = 107).

Table 2. Respondent's knowledge on preconception care (n = 107).

(a)			
Characteristic	Category	Frequency (n)	Percentage (%)
Definition of preconception care	Correct	95	88.8
	Incorrect	12	11.2
	Total	107	100.0
Components of preconception care known	5 components	12	11.2
	3 - 4 components	42	39.3
	1 - 2 components	22	20.6
	None	31	29.0
	Total	107	100
Benefits of preconception care known	5 benefits	28	26.2
	3 - 4 benefits	52	48.6
	1 - 2 benefits	18	16.8
	None	9	8.4
	Total	107	100
Personnel responsible for provision of preconception care	Nurse only	2	1.9
	Midwife only	4	3.7
	Doctors only	0	0
	All of the above	101	94.4
	Total	107	100
Target individuals for preconception care	Women of reproductive age	101	94.4
	Others	6	5.6
	Total	107	100

Continued

	Routine	36	33.6
When should preconception care be provided	During Antenatal	1	0.9
	During Postnatal	3	2.8
	All of the above	67	62.5
	Total	107	100
(b)			
Characteristic	Category	Frequency (n)	Percentage (%)
Ever attended a workshop on preconception care	Yes	6	5.6
	No	101	94.4
	Total	107	100.0
Preconception care should only be offered to high-risk women	Yes	24	22.4
	No	83	77.6
	Total	107	100
Preconception care should only be offered to high-risk women	Yes	88	82.2
	No	19	17.8
	Total	107	100
Preconception care can reduce maternal and child mortality	Yes	102	95.3
	No	05	4.7
	Total	107	100
Preconception care can lead to better pregnancy outcome	Yes	107	100
	Total	107	100
Preconception counselling can improve chances of having a healthy baby	Yes	107	100
	Total	107	100

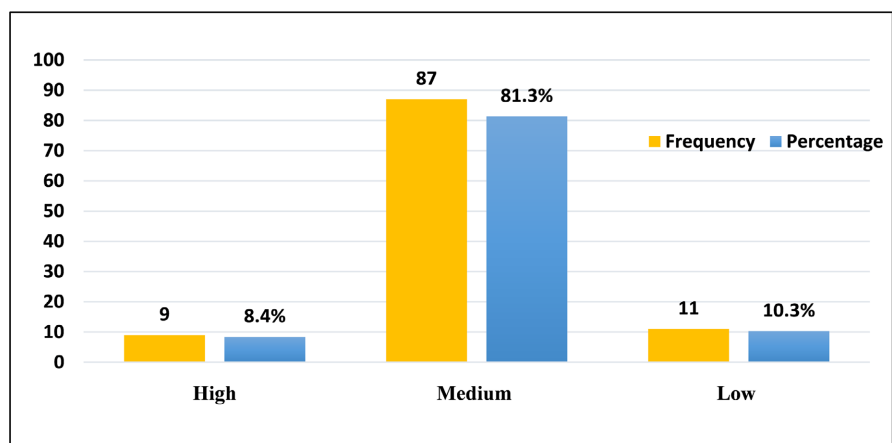


Figure 2. Respondents overall knowledge levels on preconception care (n = 107).

4.1.4. Practice of Preconception Care

Table 3 shows that 74.8% (80) of the respondents reported having rendered preconception care, while 25.2% (27) never did. Among those who had rendered preconception care before, 72.5% (58) rendered counselling services. **Table 3** also shows that 37.5% (30) had never rendered preconception care in the past month before data collection, while 42.5% (34) reported rendering preconception care once to five times in the previous month. Family planning was the main setting in which 77.5% (62) respondents provided preconception care; 69.2% (74) reported lack of accessible written protocols regarding preconception care; and 34.6% (37) reported having beliefs concerning revealing of pregnancy.

Figure 3 shows that 70.1% (75) of the respondents had good practices, while 29.9% (32) had poor practices.

Table 3. Respondent's practice of preconception care (n = 107).

Characteristic	Category	Frequency (n)	Percentage (%)
Ever rendered preconception care services/counselling	Yes	80	74.8
	No	27	25.2
	Total	107	100
Type of preconception care/ services rendered	Counselling	58	72.5
	Infertility	10	12.5
	FP/ANC	12	15.0
	Total	80	100
Number of times rendered preconception care in the previous month	1 - 5 times	34	42.5
	6 - 10 times	13	16.3
	Over 10 times	3	3.8
	None	30	37.5
	Total	80	100
Setting in which preconception care was rendered	Family Planning	62	77.5
	Child Health Clinic	10	12.5
	School Clinic	2	2.5
	Youth corner	6	7.5
	Total	80	100
Initiates preconception care/counselling to clients	Yes	63	78.8
	No	17	21.3
	Total	80	100
Availability of accessible written protocol regarding preconception care	Yes	33	30.8
	No	74	69.2
	Total	107	100

Continued

Cultural beliefs concerning revealing of a pregnancy	Yes	37	34.6
	No	70	65.4
	Total	107	100

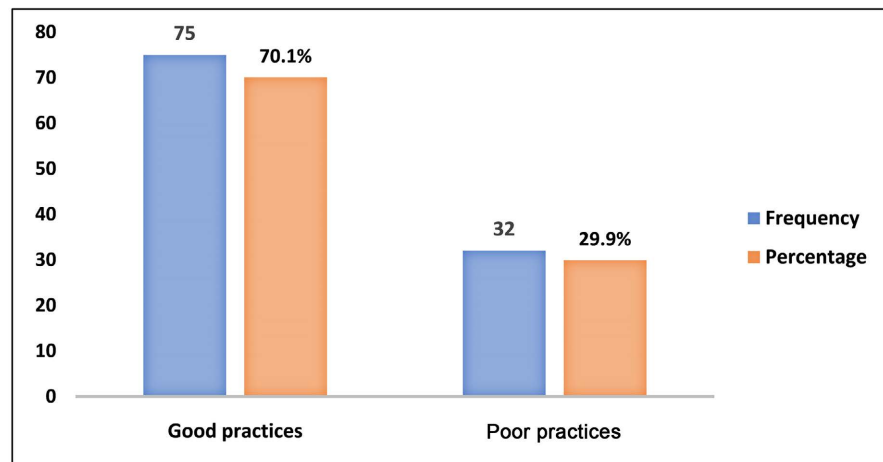


Figure 3. Shows that 70.1% (75) of the respondents had good practices, while 29.9% (32) had poor practices (n = 107).

4.1.5. Attitudes towards Preconception Care

According to **Table 4**, 94.4% (101) of respondents indicated that preconception care is an important health issue for women of child bearing age and 82.2% (88) disagreed that having a dedicated preconception care clinic is a luxury; 92.5% (99) were of the view that planning for a pregnancy is necessary; 80.4% (86) stated that providing preconception care did not add more workload onto health care providers; 96.3% (103) stated that they initiated the talk on preconception care to women of child bearing age; and all the respondents, 100% (107) stated that the best time to deal with health risks was before pregnancy.

According to **Figure 4**, 92.5% (99) of the respondents exhibited positive attitudes towards preconception care, whereas 7.5% (8) exhibited negative attitudes.

4.1.6. Associations between Variables

Table 5 shows that the association between married 37.75% (23) and unmarried 8.7% (4) respondents who provided preconception care was statistically significant ($p = 0.001$). The association in the provision of preconception care between those with college 12.7% (7); and university 38.5% (20) education was statistically significant ($p = 0.003$). Similarly, the association in the provision of preconception care between midwives 27% (10), nurses 7.9% (3) and doctors 43.8% (14) was statistically significant ($p = 0.02$). The association between religious affiliation and provision of preconception care was also statistically significant ($p = 0.01$). On the other hand, the association between provision of preconception care and age group ($p = 0.122$), gender ($p = 0.213$) and length of service ($p = 0.592$) were not statistically significant.

According to **Table 6**, the association between provision of preconception care and respondents with low (9.1%), medium (26.4%) and high (33.3%) knowledge was not statistically significant ($p = 0.336$). Similarly, the association between provision of preconception care and good (28%) and poor (18.8%) practices, and those with positive (25.3%) and negative (25%) attitudes was not significantly significant (p -values > 0.05).

Table 4. Respondent's attitude towards preconception care (n = 107).

Characteristic	Category	Frequency (n)	Percentage (%)
Preconception care is an important health issue for women of child bearing age	Yes	101	94.4
	No	6	5.6
	Total	107	100
Having a dedicated clinic for preconception care is a luxury service	Yes	19	17.8
	No	88	82.2
	Total	107	100
Planning for a pregnancy is necessary	Yes	99	92.5
	No	8	7.5
	Total	107	100
Providing preconception care is more workload on the health care provider	Yes	21	19.6
	No	86	80.4
	Total	107	100
Whether one can initiate the talk about preconception care to women of child bearing age	Yes	103	96.3
	No	4	3.7
	Total	107	100
The best time to deal with health risk factors	Before pregnancy	107	100
	Total	107	100

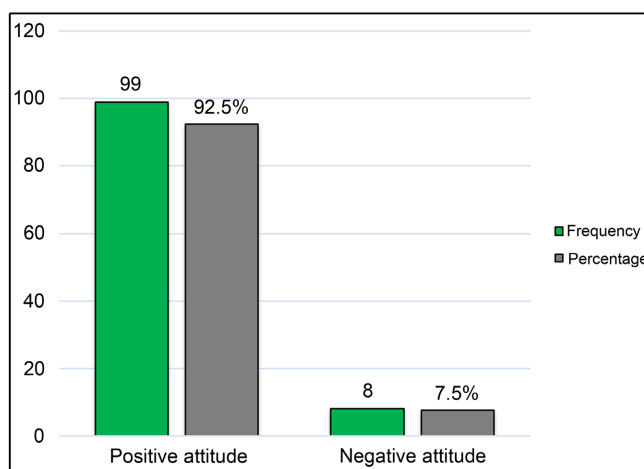


Figure 4. Overall attitude towards preconception care among respondents (n = 107).

Table 5. Association between provision of preconception care and socio-demographic characteristics.

Characteristic	Category	Provision of preconception care			p-value
		Yes, n (%)	No, n (%)	Total	
Age group	20 - 25 years	4 (11.8)	30 (88.2)	34 (100)	0.122 ^{FE}
	26 - 30 years	4 (36.4)	7 (63.6)	11 (100)	
	31 - 35 years	5 (35.7)	9 (64.3)	14 (100)	
	≥ 36 years	14 (29.2)	34 (70.8)	48 (100)	
Gender	Male	10 (34.5)	19 (21.7)	29 (100)	0.213 ^{CH}
	Female	17 (21.8)	61 (78.2)	78 (100)	
Marital status	Unmarried	4 (8.7)	42 (91.3)	46 (100)	0.001 ^{CH}
	Married	23 (37.7)	38 (62.3)	61 (100)	
Education level	College	7 (12.7)	48 (87.3)	55 (100)	0.003 ^{CH}
	University	20 (38.5)	32 (61.5)	52 (100)	
Religion	Christianity	22 (22.0)	78 (78.0)	100 (100)	0.01 ^{FE}
	Islam	5 (71.4)	2 (28.6)	7 (100)	
Length of service	Under 1 year	0 (0.0)	1 (100)	1 (100)	0.592 ^{FE}
	1 - 2 years	4 (28.6)	10 (71.4)	14 (100)	
	2 - 5 years	5 (16.7)	25 (83.3)	30 (100)	
	Over 5 years	18 (29.0)	44 (71.0)	62 (100)	
Profession	Nurse	3 (7.9)	35 (92.1)	38 (100)	0.002 ^{CH}
	Midwife	10 (27.0)	27 (73.0)	37 (100)	
	Doctor	14 (43.8)	18 (56.3)	32 (100)	

FE = Fisher's Exact Test, *CH* = Chi Squared Test.

Table 6. Association between provision of preconception care and knowledge, attitude and practice.

Characteristic	Category	Provision of preconception care			p-value
		Yes, n (%)	No, n (%)	Total	
Knowledge on preconception care	Low	1 (9.1)	10 (90.9)	11 (100)	0.336 ^{FE}
	Medium	23 (26.4)	64 (73.6)	87 (100)	
	High	3 (33.3)	6 (66.7)	9 (100)	
Practice of preconception care	Good	21 (28.0)	54 (72.0)	75 (100)	0.344 ^{CH}
	Poor	6 (18.8)	26 (81.2)	32 (100)	
Attitude towards preconception care	Good	25 (25.3)	74 (74.7)	99 (100)	1.000 ^{CH}
	Bad	2 (25.0)	6 (75.0)	8 (100)	

FE = Fisher's Exact Test, *CH* = Chi Squared Test.

4.1.7. Univariable and Multivariable Logistic Regression Analysis

Table 7 shows that univariable analysis of being married versus unmarried (cOR = 6.36, CI = 2.01, 20.0, $p = 0.002$) and having university education compared to college education (cOR = 4.29, CI = 1.62, 11.3, $p < 0.001$), significantly increased the odds of providing preconception care among midwives, nurses and doctors. Furthermore, univariable results show that being a Christian compared to belonging to other religions (cOR = 0.11, CI = 0.02, 0.62, $p = 0.012$) and being a nurse compared to being a doctor (cOR = 0.11, CI = 0.03, 0.43, $p = 0.002$), had 0.11 times lower odds of providing preconception care. The effects of both analyses were statistically significant. On the other hand, the effects of age, gender, knowledge, and practice on provision of preconception care were not statistically significant at univariable analysis ($p > 0.05$). Similarly, multivariable analysis of the effects of variables; age, gender, marital status, education, religion, profession, knowledge, attitude and practice on provision of preconception care were also not statistically significant.

Table 7. Univariable and multivariable logistic regression analysis results on provision of preconception care.

Variables	Univariable analysis			Multivariable analysis		
	cOR	CI (95%)	p-value	aOR	CI (95%)	p-value
Age group						
20 - 25 years	Ref			Ref		
26 - 30 years	4.29	0.86, 21.5	0.077	2.74	0.24, 30.7	0.414
31 - 35 years	4.17	0.92, 18.9	0.064	3.36	0.46, 24.4	0.231
> 35 years	3.09	0.92, 10.4	0.069	2.32	0.48, 11.3	0.298
Gender						
Male	Ref			Ref		
Female	0.53	0.21, 1.35	0.183	2.22	0.42, 11.6	0.345
Marital status						
Unmarried	Ref			Ref		
Married	6.36	2.01, 20.0	0.002	3.09	0.80, 12.0	0.103
Education level						
College	Ref			Ref		
University	4.29	1.62, 11.3	0.003	1.55	0.36, 6.67	0.553
Religion						
Islam	Ref			Ref		
Christianity	0.11	0.02, 0.62	0.012	0.13	0.01, 1.32	0.085

Continued

Profession							
Doctor	Ref			Ref			
Nurse	0.11	0.03, 0.43	0.002	0.10	0.01, 1.01	0.51	
Midwife	0.48	0.17, 1.30	0.149	0.30	0.05, 1.92	0.202	
Knowledge							
Low	Ref			Ref			
Medium	3.59	0.44, 29.6	0.235	2.71	0.27, 3.96	0.398	
High	5.00	0.42, 59.7	0.203	2.08	0.11, 38.0	0.620	
Practice							
Poor	Ref			Ref			
Good	1.68	0.61, 4.68	0.316	1.04	0.28, 3.96	0.949	

cOR = Crude Odds Ratio, aOR = adjusted Odds Ratio, CI = Confidence Interval.

4.2. Qualitative Findings

4.2.1. Theme One: Views about Preconception Care

This theme entailed participants' views about preconception care. Majority of the participants were of the view that preconception care was care provided to a woman before she conceives. The care comprises promotive and preventive services. It involves stabilising the condition(s) that a woman has, advising and educating her about the condition(s), so that she is aware of the implications before she conceives. The theme was derived from the following subthemes; care provided before pregnancy, cultural involvement in preconception care, conception is not planned and relationship between marriage and conception.

1) Care provided before pregnancy

Participants believed that preconception care was care provided to women before conception. This is derived from what three participants said:

“aaa...this is the care which is supposed to be given to a woman...before she conceives.” (Ms B.B, Midwife, FGD1)

“Almost the same as my friend has talked about...it's preparation...prior to conception...” (Mrs C.M. Midwife, FGD 2)

“This is care given to a woman...as she plans to conceive and...it is usually done in the hospital.” (Mrs A.L, midwife, FGD1)

According to *Dr Z.K.* preconception care is a period in which the woman is investigated to find out any conditions that could cause harm to her and the foetus as stated below.

“The woman is exposed to...a lot of investigations which help to discover conditions the woman is not aware...” (Dr R.K, FGD1)

Issues of culture concerning preconception care were also prominent in the discussion and a subtheme emerged as discussed below.

2) Cultural involvement in preconception care

Some acceptable preconception care practices were expressed to be against cultural beliefs. One of the participants said:

“In Africa...telling someone that it is not advisable to get pregnant...is a taboo as pregnancy is so sacred...for example a married couple and I say this woman should not become pregnant...there will be divorce or separation...but I am trying to save a life.” (Dr D.M., FGD2)

Another subtheme presented the thought that pregnancy in Africa was rarely planned for; it just happened.

3) Conception is most of the times not planned

One of the participants said that in Africa conception is usually not planned for. This is irrespective of literacy levels because even the educated realise that they are pregnant, as a by the way occurrence. The participant said: *“I think we have a lot of work to do...in terms of preconception care...unfortunately, most of the sexual activities...that we have in Africa are unplanned for...or occur by chance so the time to think of conceiving...is not there...we just find ourselves pregnant...We need to talk about it during family planning or women gathering...as there is a lot that needs to be done.” (Mrs F.M. Midwife, FGD1)*

In relation to unplanned conceptions, another subtheme that emerged was relationship between marriage and conception.

4) Relationship between marriage and conception

Participants reported that couples are usually under pressure to conceive immediately after they get married. The pressure usually came from family members who would start asking the couple what they were waiting for. At times the pressure would not come through direct questions; instead relatives would pass insinuating comments such as lack of noise in the house. One participant said; *“The way it is in Africa...marriage is equal to a child...hey start counting for a couple after marriage...that there is no noise in the house...so it is hard to provide preconception care.” (Dr C., FGD2)*

Another participant stated that the practice of expecting conception to take place soon after a couple got married was embedded in tradition. The traditional beliefs are often told to women before they get married. The participant, who was a midwife said:

“Before someone gets married...there are those traditions we go through... Where a woman is told not to go to their parents often and told to... get pregnant as early as you can...maybe in six months...they expect you to start spitting...they (women) are told not to use any family planning method...but just go there and become pregnant...” (Mrs M.M. Midwife, FGD1)

The second theme that emerged from the discussions was preconception care provision.

4.2.2. Theme Two: Preconception Care Provision

This theme, which emerged from three subthemes; Unavailability of provision of preconception care guidelines and standards, Preconception care is not provided

in a specified department and fertility issues prompting provision of preconception care.

1) Unavailability of provision of preconception care guidelines and standards

Participants said that they were providing preconception care without laid down guidelines and standards. Thus, each healthcare provider provided the care whenever they thought and felt that there was a need. Participants further explained that preconception care was most often provided after a misfortune had occurred. Consequently, due to lack of guidelines and standards, some participants felt that preconception care being provided by healthcare professionals and Ndola Teaching Hospital was not ideal. The following are statements that were said:

“We do not have it as a standard...but situationally, randomly that’s when we offer the preconception care...If they have problems for example difficulties in conceiving...that’s when we find out through investigations to prepare them for conception.” (Mrs M.M. Midwife, FGD1)

“Unfortunately, there is no set guideline that is followed...we treat them as they come....so if they end up with a complication they are advised to attend antenatal care early and referred to medical clinic for screening.” (Dr L.N., FGD1)

“It is not an area we deal with so much...very few come for preconception care, most of them come with unwanted pregnancies and they want to terminate.” (Dr D.M., FGD2)

“It is not the ideal care that we give...it is usually after a miscarriage or an event has occurred...for example, a neonatal death that’s when we provide this care...Some women in high cost clinic come before conceiving but in low cost it is rare.” (Dr D.J., FGD2)

“Those we discover postnatally...we advise them to complete puerperium and tell them to come to the hospital when they want to conceive again...but there is no schedule for them...High cost patients manage to come but low-cost patients fail due to poor economic status.” (Mrs M.Z. Midwife, FGD2)

Apart from there not being any laid down guidelines and standards, preconception care was not provided in a specified department. Therefore, the second subtheme was preconception care was not provided in a specified department.

2) Preconception Care was not provided in a specific department

Participants reported that there was no specific department where preconception care was being provided. They said that preconception care was being provided anywhere as long as there was a client seeking the service. They said the following:

“There is no area where one can go to for preconception care...so, most women get lost in the big Ndola Teaching Hospital and so they give up.” (Ms B.M. Nurse, FGD2)

“When someone wants preconception care...so, where do you go...people are

overwhelmed...there is no place for preconception care...attitude of health care, there is nowhere to direct them so they get tired to follow up.” (Mrs F.M. Midwife, FGD1)

The third subtheme was on fertility issues which prompted participants to provide the care.

3) Fertility issues prompting provision of preconception care

Fertility issues were pointed out to be critical issues that push most couples to go to health facilities and seek conception assistance. One of the participants said:

“To be honest...only people we advise are those who come with fertility issues and look at factors preventing conception.” (Dr B.M, FGD2)

The third theme which emerged was perceived benefits of preconception care.

4.2.3. Theme Three: Perceived Benefits of Preconception Care

The subthemes from which the theme emerged from were prevention of genetic disorders, avoidance of bad social habits and treatment of infertility.

1) Prevention of genetic disorders

Prevention of genetic disorders was mentioned to be benefits of preconception care because they are inherited conditions; therefore, it is important that they are ruled out before a woman gets pregnant. Some of the participants said the following:

“Circumstances where the mother to be is a sickler...the husband needs to be investigated in order to avoid a situation where both can be sicklers...which can cause poor outcome...Investigations have to be done to have a good outcome...” (Mrs M.M. Midwife, FGD1)

“Certain conditions need to be screened...and women are advised on chances of conceiving for example sickle cell partners and Rhesus negative woman need counselling.” (Mrs S.S. Midwife, FGD2)

“During my practice...I met a number of clients with Bad Obstetric History (BOH)...so, if they prepare them and they are willing to be investigated...they can be helped to have good outcome.” (Mrs A. L. Midwife, FGD1)

“Preconception care prevents further complications for the pregnancy...for example, we advise these women to take folic acid and ferrous sulphate before conceiving in order to boost the haemoglobin...and prevent neural tube defects.” (Mrs B.B. Midwife, FGD1)

Apart from prevention of genetic disorders, avoidance of bad habits was also mentioned as benefits of provision of preconception care.

2) Avoidance of bad social habits

Some participants stated that preconception care helped discover harmful social habits such as smoking, which negatively affect pregnancy, childbirth and the foetus. One of the participants said:

“In addition, it helps physically...for the lady there are changes a woman needs to change for example...smoking, the woman is taught on the risks so they can change and stop smoking.” (Mrs G.S. Midwife, FGD2)

The third subtheme under perceived benefits of preconception care was treatment of infertility.

3) Treatment of infertility

Infertility can be emotionally and financially devastating to couples, and is one of the problems that couples experience. Therefore, preconception care is of benefit to such couples because some of the causes of infertility could be treated. Some of the statements from the participants are as follows:

“When I was working in gynaecology clinic...this woman had BOH due to cervical incompetence...she was seen by the gynaecologist and advised to start folic acid...umm shirodikar suture was put when she conceived, she had a successful pregnancy and good outcome.” (Mrs A.L. Midwife, FGD1)

“I encountered one woman who was not conceiving for two years...she was given antibiotics and some other medication...she conceived and had twins...” (Ms N.M Midwife, FGD1)

Participants related the benefits of provision of preconception care to pregnancy outcome. Thus, the fourth theme that emerged was presence of a relationship between provision of preconception care and pregnancy outcome.

4.2.4. Theme Four: Presence of a Relationship between Provision of Preconception Care and Pregnancy Outcome

Most of the participants asserted that there was a relationship between preconception care and pregnancy outcome. Hence, they felt that if preconception was a stand-alone package of care with protocols and guidelines, there would be better pregnancy outcomes. The following are some of the statements stated:

“There is a very big relationship...for example, a mother who is diabetic and does not know...so, when they conceive they usually have poor outcome...they have premature babies...if they reach term they experience caesarean section due to big babies...If they receive preconception care...they can be monitored frequently and help to control the sugar.” (Mrs M.M. Midwife, FGD1)

“Yes, there is a relationship in the outcome...from the good advice you give to the woman for example...good advice on good nutrition given to the woman...the good the outcome of the baby. If this woman is not eating well...they will have growth restriction due to lack of nutrients.” (Ms B.B. Midwife, FGD1)

“The current case of maternal mortality...this woman was gravida 5 and the previous babies weighed 4 kg... 3.6 kg...4 kg...and 4 kg...am not sure of the current weight as it was a neonatal death...if preconception care was provided such a death would have been prevented.” (Mrs A.L. Midwife, FGD1)

Participants intimated that due to pre-existing conditions such as cardiac conditions that some women have, they should not be allowed to become pregnant. This is because such conditions have adverse effects on pregnancy and equally, pregnancy has adverse effects on the condition; thereby, posing morbidity and mortality risks to both mother and foetus. Two participants said the following statements:

“There is a significant relationship between maternal mortality and preconception care...Some clients are not supposed to get pregnant...after identifying the problem for example cardiac problems...but unfortunately for us...women come already pregnant...and so, we need to manage them...The other thing causing maternal mortality is tuberculosis...so, if they are screened before conceiving we can have better outcome.” (Dr R.K. FGD1)

“Yes, it is very true there is relationship...like said you look at a woman...and predict the possible complication that can occur to the woman and...so, you can advise on how to handle and prevent complication...sometimes you can even tell them not to get pregnant if the condition is very... or out of control for example...cardiac patients in that way you are preventing maternal mortality.” (Dr B.M. FGD2)

5. Discussion

5.1. Characteristics of the Respondents

The key background characteristics included age, gender, marital status, level of education, religion, length of service and profession. **Table 1** showed that 31.8% (34) of the respondents were aged between 20 and 25 years and most, 72.9% (78) were females. This is not a surprising finding based on the fact that nursing and midwifery are female dominated [12] as they were the majority of the respondents. However, on the contrary, a study conducted by Abayneh *et al.* [13] in Ethiopia revealed that more than half, 51% (183) of the participants were male. Slightly over half, 57% (61) of the respondents were married (**Table 1**). This might be due to marriage being a culturally acceptable practice in Zambia. These findings are similar to Kwaleyela *et al.* [14] in a study titled childbirth experiences of women birthing in Zambia: an interpretive focus phenomenological study had a theme conforming to societal expectations, which revealed the relationship between marriage and childbirth in Zambia. Midwives, 34.6% (37) and nurses, 35.5% (38) made the majority of the respondents (**Table 1**). This is similar to the report by the WHO [15], which stated that approximately 27 million men and women make up the global nursing and midwifery workforce. These statistics calls for the need of midwives and nurses to be involved in preconception care issues. Nurses and midwives are central in the provision of Primary Health Care (PHC) and are often the first and sometimes the only health professional that people see; hence, the quality of their initial assessment, care and treatment is vital [15].

5.2. Provision of Preconception of Care

Findings from this study revealed that majority, 75% (80) of the respondents were not providing preconception care (**Figure 1**). This was attributed to unavailability of provision of preconception care guidelines and standards. The findings are similar to those in a study conducted by Sori *et al.* [16] in Eastern Ethiopia, where 85.1% of the respondents reported that there were no precon-

ception care guidelines in their institution. Due to non-availability of preconception care standards and guidelines at Ndola Teaching Hospital, service provision was being done in a disorderly manner. Uncoordinated provision of services in any setting does not lead to gainful acquisition of potential benefits; in this case, ensuring that a woman is in her best state of health, in particular reproductive health, when she conceives.

Commonest times healthcare workers provided preconception care was after a woman had a miscarriage or a neonatal death. For women with medical or surgical conditions, they were counselled and advised to consult a gynaecologist before conceiving again. However, since there is no specific department that provides preconception care, most women do not adhere to the advice of consulting a gynaecologist. Instead they are seen when they fall pregnant and attend antenatal clinic. Similarly, in a study by M'hamdi *et al.* [17] conducted in the Netherlands, authors asserted that the country did not have a preconception programme in which contents of preconception care were standardised. On the contrary to this study's findings, in a study by Shawe *et al.* [18], preconception recommendations for women with chronic diseases, such as diabetes mellitus and epilepsy, were advised; hence, preconception guidance was often included in antenatal and pregnancy guideline. Midwives, nurses and doctors at Ndola Teaching Hospital affirmed that they did not provide ideal preconception care because they did not follow any guidelines. This finding is consistent with findings from a study conducted in Nigeria by Ojifinni and Ibisomi [19] in which they indicated that there was no defined preconception care service and no laid down guidelines, policy or structure for such a service in the country.

The participants in this study affirmed that provision of preconception care in terms of good nutrition is important before, during and after pregnancy. Good nutrition helps prevent maternal and child morbidities and mortalities as the woman would have enough nutrients and haemoglobin to carry the pregnancy to term and have a successful delivery [20]. In the absence of good nutrition, a pregnant woman could have complications such as anaemia and uterine atony, which could lead to PPH; the commonest cause of maternal deaths in Zambia [21]. This finding is consistent with results from a systematic review and meta-analysis conducted by Young *et al.* [22], which revealed that maternal haemoglobin plays an important role with regard to maternal and child health outcomes. Low maternal haemoglobin was associated with increased odds of poor birth outcomes, including low birth weight, preterm birth, small for gestation age, stillbirth, perinatal mortality, and neonatal mortality, and adverse maternal health outcomes, including PPH, preeclampsia, and transfusion [22]. In relation to this study, the doctors, midwives and nurses at Ndola Teaching hospital reported that nutrition was part of the content that was usually discussed during preconception care provision.

There was also a statistically significant association between provision of preconception care and level of education, with a p-value of 0.003 (Table 5). At tertiary level, participants with university education were 4.29 times more likely to

provide preconception care compared to those with college education (OR = 4.29, CI = 1.62, 11.3, P = 0.003). This finding implies that acquisition of university degree increased the likelihood of an individual to provide preconception care. Hence, encouraging continuous professional development (CPD) may significantly contribute to more of the health care providers providing preconception care. The findings are consistent with Ukoha *et al.* [23], where it was reported that being a nurse and having little preconception care knowledge reduces the chances of providing the care to women and couples.

In the current study provision of preconception care was low; 25% (27) (Figure 1). This finding is similar to a systematic review by Goossens *et al.* [24] who asserted that health care providers reported more barriers, such as unplanned pregnancies and lack of awareness among women than facilitators to provision of preconception care. Proper provision of preconception care has potential to improve pregnancy outcome in the sense that the health status of a mother has impact on her pregnancy and the foetus. For example, if a mother has diabetes mellitus, the condition has potential to worsen if it is not controlled, thereby affecting progress of the pregnancy and outcome of the foetus, resulting in conditions such as macrosomia, difficult birth due to shoulder dystocia, PPH, ruptured uterus, prematurity, still births or increased incidences of neonatal deaths [20]. The low provision of preconception care finding in this study is similar to findings in sub-Saharan Africa, as reported by Ukoha *et al.* [23] that preconception care provision was low among health care workers because of role uncertainty and a lack of resources or guidelines to remind them on what to do. If preconception care were to be provided adequately, it could assist women with bad habits like smoking cigarette or taking alcohol to stop before embarking on getting pregnant, because such habits pose a danger to the growing foetus. Similarly, in a study by Hamułka *et al.* [25], it was stated that both cigarette smoking and alcohol use increased the risk of preterm birth as well as low birth weight.

5.3. Knowledge of Preconception Care

The findings in this study revealed that majority, 88.8% (95) of the respondents correctly defined preconception care as care provided to women before planning for pregnancy (Table 2(a)). This could be attributed to preconception care being in the curriculum for midwives, nurses and doctors [2]. Similar findings were also reported in a study conducted by Ojifinni and Ibisomi [19] in Nigeria, the level of knowledge among participants was 85.9%. The concept of preconception is well known by most health workers as reported by Munthali *et al.* [26] in Malawi, that most of the health workers knew the definition of preconception care; however, they, lacked details about the process and what services to offer to clients. The finding of respondents not knowing what to offer during preconception care in Malawi is similar to the current study; as most 88.8% (95) of the midwives, nurses and doctors at Ndola Teaching Hospital could not mention five components of preconception care (Table 2(b)). This could be attributed to

the lack of preconception care in the MCH package [16]. The lack of preconception care package was also reported in Nigeria where policy makers highlighted a lack of a defined preconception care service in the country [19]. They further stated that health policies in MCH services in Nigeria focused on the use of antenatal care and skilled delivery services, and not on specialised or specific care in preparation for conception [19]. Lack of awareness about preconception care is the major problem that affects utilisation of health services among reproductive age groups [27].

Apart from medium knowledge levels about preconception care among 81.3% (87) of participants in the current study, it was reported that actualising preconception care was very difficult due to cultural orientation of most Zambian people, as majority of pregnancies were unplanned. The issue of unplanned pregnancies puts midwives, nurses and doctors at Ndola Teaching Hospital in an awkward position as they receive most women who are already pregnant and they are left with nothing much to do. These findings are consistent with a study conducted by Zeru [28] in Ethiopia which stated that the overall prevalence of unplanned pregnancy was 31.02%. This is a high percentage which could be reduced if people have knowledge of preconception care [28]. Similarly in another study by Ojukwu *et al.* [3], GPs acknowledged that unplanned pregnancies or short inter-pregnancy intervals meant women did not seek advice on preconception health, and thus, there was a lack of time to improve health behaviours. This has been acknowledged in the findings of this study where majority of the respondents, 82.2% said that preconception care could reduce unplanned and unwanted pregnancies and maternal and child mortality (95.3%). Goshu *et al.* [8] also supports this study's finding, as they stated that the risk of maternal and infant mortality can be reduced by increasing access to quality preconception care.

Furthermore, concerning who is supposed to provide preconception care, 94.4% (101) of the respondents considered preconception as a midwives, nurses and doctors' responsibility. This finding is consistent with findings from a study conducted by Ojukwu *et al.* [3], which indicated that midwives, nurses and doctors should provide the care as they come in contact with women of reproductive age, who require preconception care, as they carry out contraception consultations or whilst undertaking cervical screening, during postnatal review, or when seeing adolescents in schools. The WHO [15] acknowledges the fact that midwifery and nursing are the largest occupational group in the health sector, accounting for approximately 59% of the health professions; therefore, they are appropriate to provide preconception care.

In Zambia there has been workshops on various MCH programmes, for example, management of Emergency Obstetric and Neonatal care (EmONC) whose focus is on the curative component, neglecting preconception care, which is a preventive measure to most of the conditions managed [29]. Majority, 94.4% (101) of the respondents had never attended a workshop on preconception care (Table 2(b)) hence the medium knowledge on preconception care finding in

this study. Most of the respondents, 77.6% (83) were of the view that preconception care should not be offered to high-risk women only (**Table 2(b)**). On the contrary in a study conducted by Ojukwu *et al.* [3] in England, GPs targeted care and preconception advice to women with established medical conditions such as diabetes mellitus or epilepsy. This involved specific advice about the need for good glucose control before conception for women with diabetes mellitus, and the need to review medications that may be teratogenic in other chronic medical conditions. The WHO [1] also affirms that preconception care should be provided to all women planning to conceive.

5.4. Practices of Preconception Care

This study established that midwives, nurses and doctors' practices of preconception care were good (**Figure 3**); as most, 70.1% (75) of the respondents had good practices towards preconception care. The good practices were despite unavailability of written preconception care protocols reported by 63.6% (68) of the respondents (**Table 3**). The finding is consistent with a result from a study conducted by Ojifinni and Ibisomi's [19] in Nigeria, which reported that practices by participants in the study were good (78.2%). With no guidelines to follow it implies that it was unclear how ideal the preconception care practiced was as 42.5% (34) of the respondents reported rendering preconception care only about one to five times in the previous month. Among the components of preconception care, counselling was the most (72.5%; 58) reported service practiced. This study revealed that most, 78.8% (63) of the counselling was initiated by midwives, nurses and doctors at Ndola Teaching Hospital especially after a bad birth outcome. On the contrary, a study by Ojukwu *et al.* [3], reported that GPs were more likely to see a woman of child-bearing age to discuss contraception rather than preconception health.

Furthermore, midwives, nurses and doctors were of the view that the family planning department should be the setting where preconception care can be practiced. Family planning department was chosen because it is envisaged that most women seeking family planning would at one point decide to conceive and therefore, preconception care would be provided to them. The finding is consistent with those found in the United Kingdom (UK) where preconception could be practiced when carrying out contraception consultations, whilst undertaking cervical screening, during postnatal review, or when seeing adolescents in schools; and the best suited professionals were nurses [3]. In this study, midwives, nurses and doctors (34.6%; 37) also reported having beliefs concerning revealing of pregnancy early. It was reported that revealing a pregnancy or intention to conceive was a taboo; therefore, this affected provision of preconception care. Similar findings were reported in a study by Roozbeh *et al.* [30], where certain beliefs affected women's attitudes towards accessing preconception care, as they were ashamed due to their older age. Honkavuo's [31] study findings in Zambia also asserted the fact that a belief in evil spirits and human beings who

have caused witchcraft is relatively common among pregnant women and they would not seek for such a service like preconception care.

5.5. Attitudes towards Preconception Care

The capacity to offer preconception care service to clients is influenced by health workers' attitude, knowledge level and perceptions about preconception care [26]. In this study, 92.5% (99) respondents had positive attitudes towards preconception care; they perceived it as a way of assisting in prevention of congenital abnormalities through early screening, testing and counselling. Similarly, in a study conducted by Ojifinni and Ibisomi [32] in Nigeria, it was reported that although all people of the reproductive age would benefit from preconception care, those who had medical problems such as hypertension, sickle cell disease, diabetes and infertility would benefit more. The study conducted in Nigeria further identified potential benefits of preconception care that included opportunity to prepare for pregnancy to ensure positive pregnancy outcomes. Similar findings were also reported in Malawi, where health workers in Mzuzu city had positive attitudes towards preconception care; they recognised it as an essential service to reduce complications during antenatal, intrapartum and postnatal periods [26]. Respondents 94.4% (101) in this study also reported that preconception care was an important health issue for women of child bearing age (Table 4). This could be attributed to high number of maternal mortalities at Ndola Teaching Hospital; hence, midwives, nurses and doctors believed that preconception care could prevent some of the mortalities [21].

Participants in a study conducted by Steel *et al.* [33] stated that preconception care had a positive effect on pregnancy outcomes. In congruent with results of this study, all the respondents, 100% (107) stated that the best time to deal with health risks was before getting pregnant; hence, promoting positive pregnancy outcomes (Table 4). Nonetheless, in a systematic scoping review on current state of preconception care in sub-Saharan Africa, women with diabetes mellitus who had previously experienced obstetric disorders because of uncontrolled diabetes mellitus did not receive necessary assessments, such as blood sugar monitoring [23]. In the same review, most women with pre-existing diabetes mellitus did not seek preconception care because they were unaware that they were required to do so [23]. Others did not believe that preconception care was necessary, and the remainder were afraid that health care workers would discourage them from becoming pregnant [23]. This might have been due to health care providers' poor attitudes. Therefore, this study through the support of responses from 82.2% (88) respondents, asserted that having a dedicated preconception care clinic is a need where such women could be managed. The attitude of the health care providers is very important in provision of preconception care as asserted by this study and also a study in Nigeria where majority (90.8%) of the respondents reported that offering preconception care to clients would have positive effects on pregnancy outcomes, and they were willing to provide preconception

care because they believed that it would help reduce the burden of maternal and infant mortality [34].

6. Implications of Findings on the Health Care System

6.1. Midwifery and Nursing Practice

The findings revealed medium level of knowledge among midwives, nurses and doctors at Ndola Teaching Hospital; implying that preconception care is not provided as it should because one of the pre-requisites for proficiency in any service is adequate knowledge. Thus, women are not receiving preconception care as they should. This thus, exposes women to conceiving without pre-existing conditions managed; hence, predisposing them to developing complications.

6.2. Midwifery and Nursing Administration

The study revealed that preconception care was being provided without guidelines; therefore, there was no standard provision of care. This makes it very difficult to assess.

6.3. Midwifery and Nursing Education

Study findings showed that more doctors than midwives and nurses were providing preconception care to clients. With the number of midwives and nurses being more than doctors, the implication is that most clients do not get information on preconception care, and thus, get pregnant without knowing whether they are ready or not.

6.4. Midwifery and Nursing Research

The findings revealed issues of unplanned pregnancies; therefore, there is a need to conduct research on the factors contributing to the phenomenon.

7. Recommendations

Based on the findings, the researcher recommends as follows.

7.1. Ministry of Health

The Ministry should make preconception care a stand-alone care package in the MCH services. Therefore, they should spearhead formulation and implementation of guidelines or protocols to guide midwives, nurses and doctors in their practice.

7.2. Midwifery and Nursing Practice

The hospital should come up with mentorship programmes in preconception care for those working in obstetrics and gynaecology departments. There should also be planned programmes of contacting at-risk women and provide them with preconception care. Additionally, sensitisation on preconception care should

be done so that the public is aware of the care; hence, utilise it.

7.3. Midwifery and Nursing Research

There is a need to conduct a research on preconception care on a bigger scale.

8. Strength and Limitations of the Study

The strength of this study was the use of a mixed study design, as both the quantitative and qualitative components complimented each other. The study involved midwives, nurses and doctors working at Ndola Teaching Hospital, therefore, generalisation of the findings to other health facilities should be done with caution because of contextual differences. Otherwise the results are a true reflection of the involved health workers at Ndola Teaching Hospital.

9. Conclusion

Available literature showed that provision of preconception care was still low in most countries, particularly in low and medium level countries. Midwives, nurses and doctors at Ndola Teaching Hospital knew about preconception care; however, provision of the care was low and not standardised because there are no guidelines from MoH. This study recommends that preconception care be a stand-alone care package like antenatal, intranatal, postnatal and family planning because of its positive impact on maternal and neonatal morbidity and mortality. The MoH should spearhead formulation and implementation of guidelines or protocols to guide the midwives, nurses and doctors in their practice.

Declaration

I, Gloria Sakanyi, do hereby declare to the Senate of University of Zambia that this dissertation is my own original work and has neither been submitted nor been concurrently submitted for degree award in any other institution.

Ethics Approval and Consent to Participate

Ethical clearance was obtained from the University of Zambia Biomedical Research Ethics Committee (REF No.3072-2022) and the National Health Research Authority.

Availability of Data and Material

The datasets used and/or analysed during the current study are available from the corresponding author and the University of Zambia on reasonable request.

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Authors' Contributions

GS, FC and CNK contributed to the conception of the project, proposal writing,

data collection, data analysis, study supervision and manuscript writing.

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Conflicts of Interest

The authors declare that they have no competing interests in this study.

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