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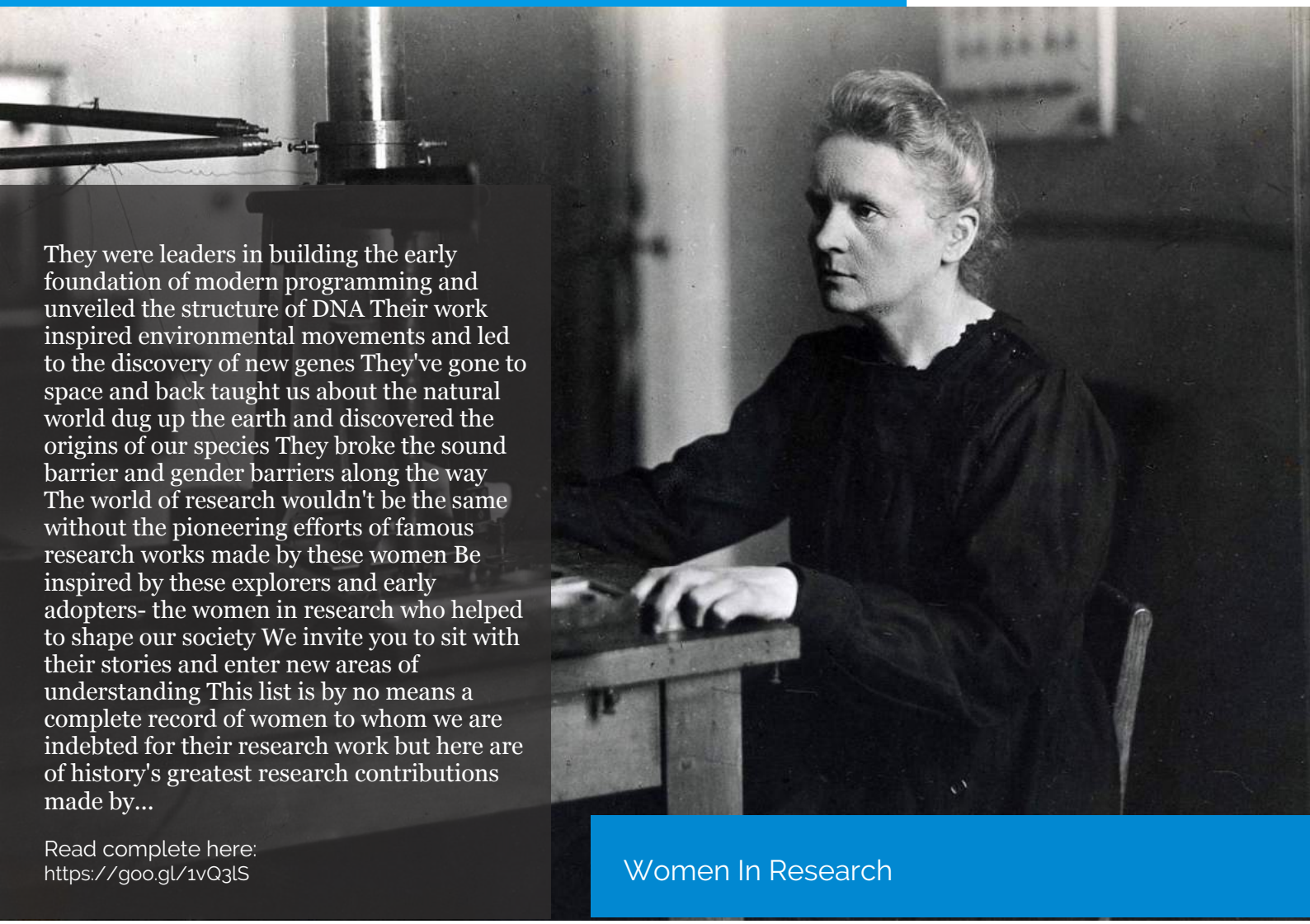

They were leaders in building the early foundation of modern programming and unveiled the structure of DNA Their work inspired environmental movements and led to the discovery of new genes They've gone to space and back taught us about the natural world dug up the earth and discovered the origins of our species They broke the sound barrier and gender barriers along the way The world of research wouldn't be the same without the pioneering efforts of famous research works made by these women Be inspired by these explorers and early adopters- the women in research who helped to shape our society We invite you to sit with their stories and enter new areas of understanding This list is by no means a complete record of women to whom we are indebted for their research work but here are of history's greatest research contributions made by...

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Changes in Adolescent Fertility in Benin from 2006 to 2017

Guy Armand Onambele & Arouna Ogouchôni Lekoyo

ABSTRACT

Due to over social control and social representative of sex, adolescents adopt risky behavior exposing them to early pregnancies. This study aims to analyze fertility factors among adolescents in Benin. It uses data sets from 2007, 2014 and 2017 Demographic and Health Surveys (DHS) to describe adolescents' behavior feeding early fertility status. On top of logistic model, simple and advanced decomposition analysis are used to determine the sources of change in adolescent fertility over the study period. The results highlight that adolescent's age, first cohabitation with opposite sex and first sexual intercourse have the greatest impact in adolescent's fertility. The sources of phenomenon changes within the 10 years are rooted in household standard of living and adolescent level of education. These changes are either linked with individual behavior or related to government measures. To reduce early pregnancy among adolescents, individual and collective solutions are requested. Firstly, sex education for adolescents must focus on modern contraception methods, early pregnancy risks and postponement of the first sexual intercourse. Secondly, raising community awareness to mitigate cultural patterns which tend to expose teenagers to pregnancy, to law age of first cohabitation, and early marriage.

Keywords: adolescent, fertility, SDGS, sexual and reproductive health, behavior change communication.

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Keywords: adolescent, fertility, SDGS, sexual and reproductive health, behavior change communication.

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I. INTRODUCTION

The adolescent reproductive health is part of the main priorities among the 17 Sustainable Development Goals (SDGs) to be achieved by 2030. That's why, all countries are committed to monitor key indicators related to this matter. Benin's current female population is 6,365,510 what means 50.7% of the total population. Among them, 2,347,091 women are aged 15-24 years.

This large figures of women or young girls in the Beninese population whose sexual behavior influences the demography is an indicative vector of the exponential fertility rate. Being pregnant before the maturity of the body can compromise health, scholarship, even community improvement. This article uses data from the Demographic and Health Surveys (DHS) conducted in Benin in 2006, 2011 and 2017 respectively. Early pregnancies have a downward trend from 2007 to 2011: 16.8% to 13.3%.

However, the phenomenon is reversed between 2011 and 2017. An increase of almost two percentage points from 13.3% to 15.2%. Seeking the explanation of this phenomenon trend request to understand adolescent sexual behavior. The literature review on this matter shows that the previous works related to adolescent sexual behavior cover theories and field works as well.

1.1 Literature review

1.1.1 Socio-cultural approach

Female adolescent fertility remains an issue of predilection because it arouses particular interest. it used to be linked with to culture. This approach stipulates that the sexual behaviors of individuals are influenced by their morals, living environment, socio-cultural norms of life and the demands of gender that influence the functioning

of the society in which they live. In other words, sexuality is a social construct. Framed by a set of laws, customs, rules and norms that vary in time and space (Lhomond, 2009). Thus, the sexual practices of individuals are based on the socio-cultural system in which they are embedded. Ways of thinking and acting inherited from traditions and customs (ethnicities or regions of residence and religions) (Emina, 2005).

Traditional values may therefore influence the sexual behavior of individuals. In Uganda, for example, the customs of some societies encourage intense sexual activity before or during marriage.

Similarly, studies on the influence of traditional values on sexual behavior suggest variation by ethnicity and religion. (Rwenge et al 2004). This approach avoids individual characteristics that can influence sexual behaviors.

1.1.2 Cultural group approach

This model of thinking shows that ethnicity influences sexual behavior. Ethnicity is recognized by several actors as an important factor in differentiating the sexual behavior of individuals, such as the age at the first intercourse, the age at first union, the use of contraception methods, the age at first pregnancy, etc. For example, studies conducted in Côte d'Ivoire by Talnan et al (2004) indicate that certain ethnic groups (Krou and Sènoufo or Malinké) increase their chances (2.13 and 1.66 respectively) of having sexual relations before the age of 16 compared to girls from the Akan group. Furthermore, pregnancy and virginity are requested by some social group before marriage.

1.1.3 Biological approach

1.1.3.1 Premarital virginity

The first factor that can explain the fertility of adolescents in Benin is the age of sexual debut. Several studies have attempted to demonstrate that the age of first sexual contact (i.e., early sexuality) increases the fertility rate among adolescents. The adolescents, because of their early sexual debut, are also more exposed to early motherhood because they have a longer exposure period (EDSB-V 2017-2018).

In reality, culture has two different influences on sexual behavior. Some cultures tolerate or encourage premarital or even post-marital sex (as among the Beti in Center Cameroon). Young girls in this region induce menarche in order to hasten the onset of sexual relations (Rwenge 2002, 2004). Parents have no control over their children's sexuality and do not even place much importance on a girl's virginity before marriage. On the other hand, some cultures advocate virginity and prefer unmarried girls to be virgins. In these cases, virginity has social significance (Thiriat 2000; Sa'ad, 2007).

1.1.3.2 Premarital pregnancy

In some cultural groups, young girls are encouraged to have premarital sex to prove their fertility through pregnancy before being given in marriage by their families (Rossier et al, 2013).

Thiriat (2000) confirms this theory by stating, "premarital pregnancy is valued as a guarantee of the young woman's fertility. The child will belong to the husband whether or not he is the genitor". These adolescents engage in premarital sex in order to achieve fertility, the goal of which is marriage.

It is true that the use of contraceptive methods reduces the risk of early fertility among adolescents, but in Africa, certain traditional theories undermine these modern advances. This is the subject of Nalwadda et al (2010) study on "Persistent high fertility in Uganda: Young people recount obstacles and enabling factors to use of contraceptives. The sampling method was used, as well as a survey was conducted at the local level for new perspectives. This work demonstrated that: "Various obstacles that impede contraceptive use were identified and classified into five categories that included misconceptions and fears, gender power relations, sociocultural expectations and contradictions" (Nalwadda et al, 2010).

1.1.4 Religious approach

Religion conveys a number of values and norms that govern the lives of the faithful at the behavioral, psychological and physiological levels. It therefore plays a fundamental role in the

perceptions, behaviors and attitudes of the faithful through their beliefs. In most religions, the question of sexuality is a private matter and is a taboo subject, and the true information is not relayed within it. Islam and Christianity are hostile to premarital sex and adultery.

In a study carried out in Congo, Enel and Querre (2006) stated that all churches prohibit premarital and extramarital sex and induced abortion; all advocate fidelity and abstinence; none supports the use of condoms. Yet these precepts are not scrupulously respected by believers. The use of condoms is equated with depravity of morals. Nevertheless, the influence of religion varies from one region to another. For example, in urban Côte d'Ivoire, young Muslim women are less likely to have used condoms in their lives than their Christian counterparts (Talnan et al., 2004). The same finding are provided by Dembele (2004). Even in urban settings in Latin America, it is found that there is a difference between the morals of evangelical Christians who exercise community control over the conduct of young women, forcing them to delay their entry into sexual activity (Meslé et al, 2011). The influence of religion on the sexual initiation of young people has been analyzed by Bozon et al (2006) who found that sexual initiation is postponed among girls who have experienced a "coherent" religious socialization: Catholic and Pentecostal. Some adolescents start earlier sexual activities for economic reasons.

1.1.5 Economic approach

This approach demonstrates that the sexual behaviors of adolescents and youth are determined by economic and social motivations (Moloua et al; 2004).

1.1.5.1 Safety approach

Rational coping theory demonstrates that youth engage in intimate relationships to obtain money, gifts, or other gratifications to support themselves (Rwenge 2000; 2002). The search for economic support is then the guiding vector for premarital or even premature sexual activity.

1.1.5.2 Social promotion approach

Apart from improving their living conditions, some adolescent girls give themselves to sex to ensure their passage to the next grade or to graduate from school. This theory was highlighted by Revenge (2004), who found that girls recruited some of their sexual partners from among intellectually able colleagues or teachers (Mbalmayo Region, Cameroon).

1.1.6 Institutional approach

It is based on the assumption that young people's safe behavior depends on both the policy and legal framework and the availability of legal access to information. The institutional environment for sexual activity can affect young people's sexual behavior. (Anon et al 2005; Kalanbaye, 2007). It is an approach that inflicts responsibility on laws, programs, and health services for young adolescents exposed to early sexuality (Mayack, 2014). Young adolescents, especially in rural areas, do not use contraceptive methods. This situation can be explained by a lack of accessibility or a lack of information on contraceptive methods among women who are less educated than those living in urban areas (DHSB 2017-2018).

1.1.7 Gender approach

This approach states that women or girls or adolescents, because of their low decision-making power, have no or limited control over their sexuality (Moloua et al., 2004). It assumes that narrowing the gap between male and female power will enable women to participate more effectively in decision-making in all areas, including sexuality and health (Kobelembi, 2005). Even after their early entry into fertility, adolescents are very limited in their sexual decision-making.

In Sub-Saharan Africa, gender relations are recurrent. Men dominate women in matters of sexuality. In most traditional African societies (patriarchal and patrilineal), women are considered as "social cadets" and are marginalized. In terms of marriage, the man has the last word to make the decision. For example,

when it comes to sexual activity, the young married teenage girl is not allowed to refuse her spouse sex when he wants her to (Revenge, 2012).

She then remains very ignorant and silent by remaining passive in her relationships and her power to protect herself sexually (Gupta, 2003).

1.1.8 Global approach

This approach was reaffirmed by Gueye et al (2001). They state: "Increasing modernization and media exposure, along with delineation in the authority of parents and elders, have undermined the societal and cultural rules that formerly controlled and informed adolescent sexuality.

Thus, the traditional social structures are weakened and oriented in the satisfaction of their personal desires than in the family responsibilities. With globalization, modernization, increasing urbanization, and exposure of the population to the media, there is a collapse or decline in traditional sex education (De Launay and Guillaume, 2007).

Widespread schooling in Africa and economic crises give rise to social behaviors that are not adapted to community life, but also encourage delayed sexuality. In fact, the extension of schooling for young girls prolongs celibacy and the entry into union or sexual activity (Mondain, 2006).

1.1.9 Social perception approach

Young people believe that they are hindering their fertility by using contraceptives, and women believe that by taking pills they run the risk of fibroids, cancers and other destroyed genitalia. The use of condoms by men is considered destructive to women's uterus. All these factors slow down the use of contraceptives and wrongly increase the fertility rate.

Child marriages as well as the phenomena of female circumcision are also factors that influence adolescent fertility in Benin (UNFPA, 2016). Countries with the highest fertility rates in the world are also those with the highest child marriage rates. Child marriage is a real problem because it not only spoils the future of children (young girls), but also destroys any chance of controlling their fertility (UNFPA, 2016).

The traditional conception of sex, which is considered taboo, is also a factor in the high fertility rate in Benin. The lack of communication between parents and children leads the latter to adopt behaviors that are not recommended during their adolescence.

1.1.10 School curriculum approach

UNFPA (2014), during Analysis of Policies and Programs Opportunities and Challenges on sexual and reproductive health and rights of adolescent girls in Benin observed that: "Sexuality education at the secondary level is necessary, especially if it starts at the beginning of the school curriculum (young people from 12-13 years of age or especially from puberty and before the first sexual relations). The improvement of the content of the courses and the training of the teachers and instructors of family life education is necessary.

Beyond the technical biomedical aspects, it is essential to be able to address questions of sexual and reproductive rights of young people, relations between boys and girls, gender inequalities and stereotypes that shape the power relationships in the negotiation (acceptance or refusal) of sexual relations and love". It is then up to the teachers to show ethics and good use of the knowledge acquired beyond their roles as trainers and educators.

1.2 Objectives

The overall objective of this study is to analyze the factors that explain adolescent fertility in Benin.

Specifically, the study aims to:

*Characterize the profile of adolescent already proved their fertility

*Analyze socio-cultural and economic factors that influence adolescent motherhood

1.3 Hypothesis

H1: We assume that adolescent fertility in Benin is related to social inequalities in living standards.

That is, adolescent girls from lower living standards contribute more to the increase in fertility in all three periods.

H2: We assume that adolescents with low levels of education contribute more to the increase in early fertility than those with high levels of education in all three periods.

H3: We hypothesize that adolescents who enter sex early contribute more to the increase in early fertility than those who enter sex late.

1.4 Limitations of the study

The phenomenon could be better understood if we had at our disposal data that took into account adolescents under 15 years of age, since many adolescents in Benin become pregnant before the age of 15.

II. METHODOLOGY

The study population is girls aged 15-19 years. Sociodemographic data on the girls' households and on their fertility were collected through a household questionnaire. The quality of the data was assessed through the non-response rate. Only variables with more than 98% response rate were included in this study. The dependent variable is "fertility status characterized by any pregnancy of girls aged 15-19 years that resulted in a live birth in 20007, 2011 and 2017 in Benin". 14 independent variables were mobilized among which some were recoded and others were constructed from those already existing in the database. The independent variables are presented in the table in annex. The analysis files were constructed with SPSS 25 under Windows.

Stata 15 was used for the logistic regression. Two methods of analysis were used. Descriptive analysis was used to verify the association or not between the dependent variable and each of the independent variables (significance level) with a margin of error of 5% and to profile the adolescents according to their fertility status. To determine the sources of change, the simple and advanced decomposition used adolescents' education and living standards as classification variables. The simple decomposition identified the immediate sources of social change by estimating the relative contribution of two or more components to that change. These are either the performance effect (changes in group performance) or the composition effect (changes in relative group size). The use of this method requires that the variable or phenomenon to be studied be quantitative, aggregate, and gradual.

This method has been used to perceive the evolution of the level of fertility and the sources that are at the basis of this change. Explanatory analysis through logistic regression was used to identify the explanatory factors of teenage fertility from 2007, 2011 to 2017 and prioritize them. The following steps were followed: i) identification of the variables to be introduced into the model, ii) testing of the adequacy of the models to the data the Wald chi-square statistic at the 5% threshold was used, distribution of the significance of the explanatory variables by DHS, prioritization of the factors according to their contributions by making the difference between the chi-square of the final model including all the variables and the chi-square obtained from the model without these factors. Details on each element of the methodology can be found in annex.

II. RESULTS AND ANALYSIS

Simple and advanced decomposition used "standard of living" to compare driving factors within the ten years.

Period 1: 2007 to 2011

In terms of living standards, the total value of change (-3.64) is negative and tells us about a downward trend in the average number of adolescent girls with at least one child between 2007 and 2011. This trend is mainly due to the actual behavior of teenagers or the performance effect (104.71%) versus the composition effect (-4.74%), results on the graph below. Poor households (43.51%) contribute more to the decline in early fertility, followed by middle-income households (37.92%) and finally households with a high standard of living (21.28%) as shown below (figure 1) & (figure 2.)

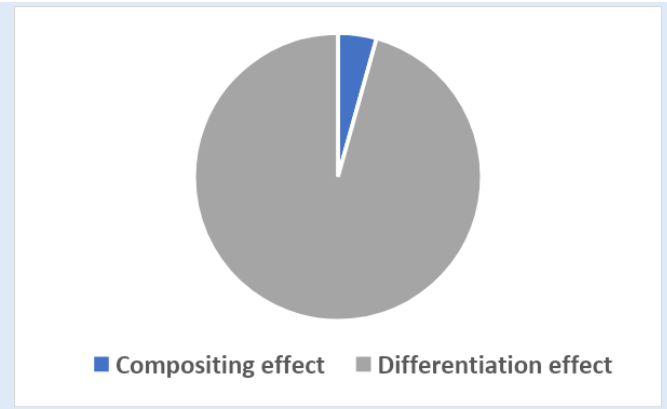

Figure 1: Distribution of standard of living effects according to their contributions (%)

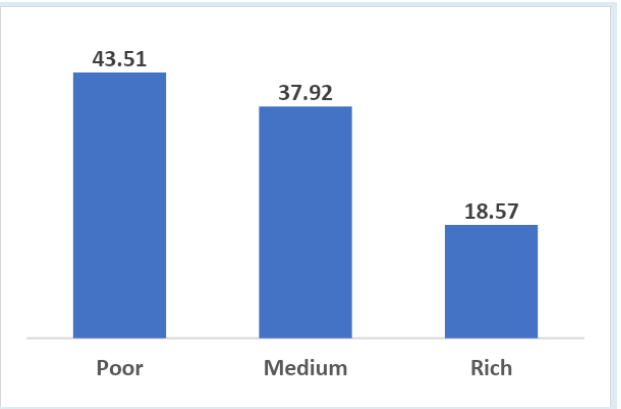

Figure 2: Chart Composition effect by living standards of adolescent girls (%)

Thus, by breaking down the performance effect, we arrive at the results presented in the figure 3 below. The basic effect (255.26%) predominates over the differentiation effect (-128.43%) and the residual effect (-22.09%). The decline in adolescent fertility is due to all socioeconomic categories, without distinction. This can be explained by the fact that the basic policies put in place to improve the population's living conditions have had a real effect on early fertility, regardless of the household's standard of living.

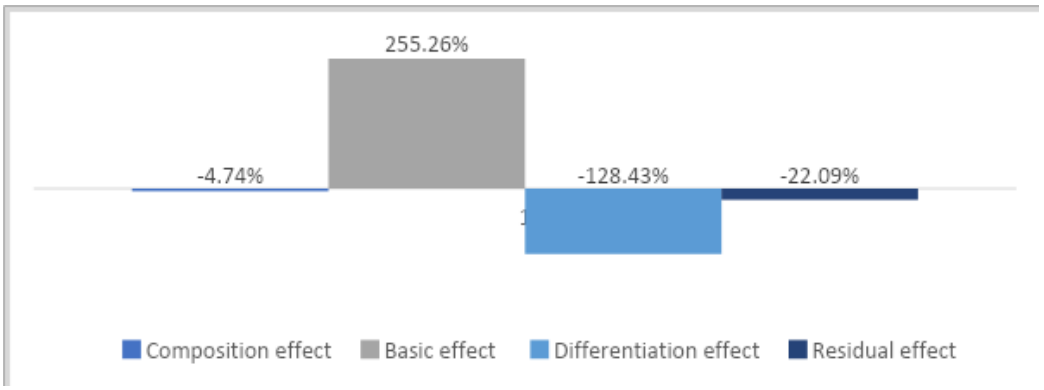

Figure 3: Advanced decomposition of the effect of living standards performance

Period 2: 2011 to 2017

For the period 2011-2017, the total value of change (1,92) in living standards shows an upward trend in the average number of adolescents with at least one child between 2007 and 2011. This trend is mainly due to the actual behavior of adolescents or the performance effect (71.24%) versus the composition effect (28.76%). Poor households (58.06%) still contribute to the increase in early fertility, followed by middle-income households (20.52%) and finally wealthy households (21.42%).

Simple and advanced decomposition used as well "education level" to compare driving factors within the ten years.

Period 1: 2007 to 2011

There is a downward trend in the value of the total change (-3.7) in relation to the average number of adolescent girls with at least one child between 2007 and 2011. This change is mainly attributed to the performance effect (75.17%), in other words, changes in the behavior of young girls of different educational levels, are the main source of the increase in early fertility observed between the years 2007 and 2011.

Period 2: 2011 to 2017

Still regarding the level of education over the period 2011 to 2017, the total value of the change is (1.95%). It tells us about an upward trend in the average number of adolescent girls with at least one child between 2011 and 2017. This trend is mainly due to the actual behaviors of teenage girls or the performance effect (74.77%) versus the composition effect (25.23%).

Indeed, the preponderant contribution of adolescents with no education and primary education, over secondary education and above, in the decline in early fertility between 2007 and 2011, is largely attributable to the base effect. Thus, the set of measures taken by the state for mass and quality education of its population has had an impact on all social strata of adolescents. And these measures refer to the organic and institutional and legislative frameworks, as well as the human and financial means for the implementation of this policy

Adolescent girls with secondary education (62.65%) contribute more to the increase in early fertility, followed by those with primary education (49.00%), while those without secondary education decrease this performance by only -11.65%. Girls' promiscuity, curiosity about sexuality, is due in part to the relaxation of social mores. Thus by decomposing the performance effect, the preponderant contribution of the secondary level of education and above, over the primary and no level, in the increase in early fertility between 2011 and 2017, is explained by the differences related to the categories (differentiation effect)

Logistic regression was used to identify factors associated with adolescent fertility (Table 1). The result from the Wald chi-square statistic shows that the critical probability (p-value) values for 2007, 2011 and 2017 are all less than 0.005. Hence, we reject the hypothesis (H0) that the vector of effects of the different coefficients between these three years (2007, 2011 and 2017) is zero and conclude that at least one independent variable has an influence on the dependent variable. Based upon the logistic regression, significant variables from one survey to another one are: sex of head of household, education level, knowledge of contraception, knowledge of ovulatory cycle, ethnicity, age at first cohabitation, age of adolescent. Age at first intercourse, household standard of living, relationship to the head of the household, and household size explain the increase in adolescent fertility in Benin each year. Of the three surveys, age at first cohabitation, age at first sexual intercourse, and age of the adolescent are consistently among the top three factors.

Age at first sexual activity

According to this study, the earlier a teenager becomes sexually active, the greater her risk of early pregnancy. In fact, compared to those who have not yet begun sexual activity, adolescents who have had their first sexual activity at age 15 have a 2.24 (2006) and 5.71 (2011) very significant (at the 1% threshold) risk of becoming pregnant before age 20. These risks can be amplified when sexual relations are maintained without the adolescent having a good control or consideration of her ovulation cycle.

Age of the adolescent

The analyses show that the risk of becoming pregnant before age 20 increases significantly with the age of the adolescent.

Age at first cohabitation

The age at first cohabitation was also found to be highly significant at the 1% level across the different study periods. Adolescents under 18 years of age are more likely to become pregnant than those who have not yet cohabited. It is 5.6 in 2006, 9.2 in 2011 and 3.41 in 2017. This age here is related to the age at first marriage and would justify the strong contribution of this variable to the phenomenon, as pregnant adolescents are mostly unmarried according to the descriptive analysis of the phenomenon.

Knowledge of the ovulatory cycle

This variable is significantly related to adolescent fertility status in 2007, 2014, and 2017. In 2007, adolescents with questionable knowledge of the ovulatory cycle were 1,60 times more likely to have children than those with good knowledge.

Same trend in 2014 with a slightly higher risk (1,622).

Knowledge of a contraceptive method

The variable knowledge of a method is significantly related to the fertility status of adolescents in all periods. They are 42 times less likely to have an early pregnancy than those with modern knowledge. This may be because they take fewer risks or adopt abstinence.

Level of education

Adolescent educational attainment is highly significantly related to adolescent fertility status between 2007, 2014 at the 1% threshold.

For the year 2007, teenage girls with no grade are 1.86 more likely to have children than their high school and above counterparts. In 2011, this risk is 2.06.

Adolescents in primary school in 2006 were 1.56 times more likely to have early fertility than those in secondary school and above.

Household standard of living

It is significantly associated with adolescent fertility status in 2014 at the 1% threshold, adolescents from poor households are twice as likely to have children early as those from rich households. The risk among middle-income households compared to wealthy households is 2.44. And in 2007 and 2017, this variable is not significantly related to the phenomenon studied.

Relationship to head of household

Compared to CM girls, other adolescent girls related to the household head such as stepdaughters, granddaughter, and adopted daughter depending on the time period less likely to have a live birth before age 20.

Gender of head of household

This variable is not significantly related to adolescent fertility status in 2007 but is in 2006 and 2011 at the 1% threshold. Girls from male-headed households in 2017 are (50.2% in 2011 and 34.1% in 2011) less likely to have children early than their counterparts from female-headed households. This may be due to their rigor of men in raising their daughter. They are overall safer from early pregnancy than the household head's own daughters.

Table 1: Logistic regression model results (2006-2011-2017)

Explanatory variables	EDSB-2006	EDSB-2011	EDSB-2017
Household size			
Household under 6 years old	0.363***	0.481**	0.550**
Household between 6 and 9	0.507***	0.745ns	1.119ns
Household of more than 10	ref	ref	ref
Age at first cohabitation			
Under 18 years old	5.648***	9.210***	3.411***
No cohabitation	0.048***	0.143***	0.089***
Age of first sexual intercourse			
From 8 to 15 years old	2.214***	5.714***	2.01ns
From 16 to 19 years old	1.589**	1.817**	4.8 ns
Knowledge of contraception			
No	0.629**	0.482***	0.583*
Traditional	1.373ns	0.685ns	0.760ns
Modern	ref	ref	ref
Knowledge of the ovulatory cycle			
No	1.076ns	0.948ns	0.797ns
Doubtful	1.604**	1.622*	1.037ns

Good	ref	ref	ref
Age group of household head			
15-19 years old	0.719ns	3.973**	4.205***
20-29 years old	1.289ns	1.808ns	1.303ns
30-39 years old	0.824ns	2.102***	0.979ns
40-49 years old	ref	ref	ref
Educational level of the adolescent			
Without level	1.864**	2.062***	1.003ns
Primary	1.557*	1.491ns	1.300ns
High school and up	ref	ref	ref
Relationship with the head of the household			
Girl	ref	ref	ref
Wife	0.854ns	0.801ns	0.606ns
Beautiful girl	0.451**	0.644ns	0.411***
Little girl	0.680ns	0.706ns	0.341**
Sister	0.704ns	0.698ns	1.240ns
Adopted daughter	1.296ns	1.074ns	0.138***
No link	0.317ns	1.108ns	0.482ns
Other parent	0.494*	0.903ns	0.382***
Place of residence			
Rural	1.120ns	0.869ns	0.973ns
Ideal number of children			
0	ref	2.426*	2.420**
1	1.229ns	11.133***	0.569ns
2 à 4	1.140ns	1.755***	1.030ns
5 and more	ref	ref	ref
Religion			
Traditional	0.641ns	0.580ns	0.409**
Muslim	0.789ns	0.972ns	0.560*
Catholic	0.706ns	0.762ns	0.876ns
Other Christians	0.657ns	0.929ns	0.991ns
Without religion	ref	ref	ref
Gender of head of household			
Male	0.498***	0.659*	1.035ns
Female	ref	ref	ref
Household standard of living			
Poor	0.892ns	2.000***	1.108ns
Medium	1.019ns	2.433***	0.882ns
Rich	ref	ref	ref
Age of the adolescent			
15	0.155***	0.107***	0.070***
16	0.107***	0.113***	0.091***
17	0.264***	0.348***	0.269***

18	0.368***	0.622**	0.421***
19	ref	ref	ref
Observations	2994	2922	3319
Nickname R-squared	0.571	0.559	0.593
Chi-deux	1574.171	1269.961	1680.789

We calculated their contributions by taking the difference between the chi-square of the final model including all the variables and the chi-square obtained from the model without these factors. The tables below (Appendix) summarize the results of the contributions of the predictors of 2007 and 2014 and 2017. it appears that age at first cohabitation, age of the adolescent, and age at first sexual activity primarily influence our dependent variable in each DHS.

III. DISCUSSIONS

The age at first cohabitation, the age of the adolescent and the age at the first sexual activity mainly influence our dependent variable in each DHS. These results go hand in hand with the conclusions of authors Simplus and Houlio (2012) and Jean Simon et al. (2021). The risks of the phenomenon decrease among adolescent girls living in a small household, a good standard of living, who have knowledge of contraception, and a level of education beyond primary school. In relation to education, and living conditions, our results are similar to those of Beninguisse (2007) and Diop (1994) in Sub-Saharan Africa who find in their work that the higher the level of education of women, the less likely they are to be mothers early. Control of the ovulatory cycle also significantly contributes to reducing the risk associated with early fertility.The other variables of the model are less involved in explaining the model in terms of contributions.

Young girls who become mothers in adolescence are "accidental" or planned. The explanatory model shows a strong contribution of age to first sexual intercourse. The age at first sexual intercourse in the study of adolescent fertility phenomena is of undeniable interest (Bozon and Hertrich, 2004). It is still revealed in the study of adolescent fertility in Benin as one of the factors that come back in the top 3 of the explanatory variables of this phenomenon an earlier sexuality of adolescent girls can be very associated with the biological factor, since puberty marks the awakening of sexuality.

The absence or inadequacy of education and information about sexuality may also be a cause. In African societies, even more so in Benin, sex issues are still taboo. Age at first cohabitation, which also comes up again and again over the course of the DHS, basically provides information that adolescent girls who are not yet exposed to cohabitation with a person of the opposite sex are much less likely to become pregnant.

To effectively combat early pregnancy in Benin, priority actions must focus on sex education for adolescents. The control of contraception and the risks of early pregnancy and the postponement of the first sexual intercourse must be accentuated.

The second action would be to raise awareness among communities with a view to eliminating practices that tend to expose adolescent girls to pregnancy, aimed at postponing the age to the first cohabitation, which could hide many other realities, such as that of early marriage. The government will also need to focus on pro-poor growth policies.

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IV. CONCLUSIONS

In order to effectively combat early pregnancy in Benin, priority actions should be focused on sex education for adolescents. The mastery of contraception and the risks of early pregnancy and the postponement of the first sexual intercourse must be emphasized. The second action would be to increase community awareness with a view to eliminating practices that tend to expose teenagers to pregnancy, aiming to postpone the age of first cohabitation, which could hide many other realities, such as early marriage.

The negative social consequences that can affect the precocious pregnant adolescent (abortion, family rejection, school exclusion) make the subject of fertility a phenomenon that must attract the attention of decision makers. In the long term, what is the impact (level of education, family life, employment, integration into society) of today's precocious adolescent in her fertile life on tomorrow's mature woman?

Is it sexual courtship that leads to early marriage and therefore to cohabitation or is it the early age of first cohabitation that leads to first sexual intercourse in departments with high early fertility rates?

ANNEXES

Annex 1: Descriptive analysis

In this analysis, we will develop a description of adolescent girls' fertility status behavior by several factors between 2007, 2014, and 2017. From this, the statistical relationships between the independent variables and the explanatory variable will be established

Chi-square test

This test will be carried out on variables taken in pairs, of a qualitative or quantitative nature grouped in classes, in order to provide information on their degree of association, with a margin of error (significance level) of 5%. In the case of our work, each of the independent variables will be crossed with the variable to be explained, which is the fertility status of adolescents.

In this test, the final decision is made after evaluating the differences between the observed numbers in the sample and the theoretical or calculated numbers that should ideally be observed if the hypothesis being tested were true. The conditions of validity of a Chi-square test are as follows: if the value of the critical probability (P-value) is less than 0.005 of the significance level, the hypothesis (Ho) that the terms of the variable to be explained are independent of those of the explanatory variable is rejected. Otherwise, we accept this hypothesis.

The chi two is calculated as follows:

$$\chi^2 = \sum\sum \frac{(théoriqueEffectifs - observés\,Effectifs)^2}{théoriqueEffectifs}$$

Annex 2: Decomposition (to determine sources of change in adolescent fertility)

Some definitions related to decomposition analysis

a) Family planning policy

We are talking about a set of elements that determine the performance of family planning. These include family planning programs (medical care, access to modern contraceptive methods, family code law) and the resources (financial, material and human) allocated to reproductive health.

b) Education policies

By this concept, we mean a set of measures taken by the State for a mass and quality education of its population. And these measures refer to the organic and institutional and legislative frameworks, as well as the human and financial means for the implementation of this policy. Individual behavior is determined by education, and its variation in the general population is likely to influence fertility behavior.

c) Economic policies

They take into account all the explicit or implicit measures taken by a state to influence the creation of national wealth and its distribution among the population in order to improve living conditions.

d) Social change

It is any transformation (whether induced or spontaneous) in the structure, functioning or performance of a social community. This change can be qualitative (laws, norms, etc.) or quantitative (the rise infertility in a country, etc.).

Quantifiable changes may in turn be intrinsic to the society itself or come from the aggregation of individual behaviors. For example, a change in the way a country is elected is of the first type, while a change in the percentage of participation in the electoral process is of the second type.

e) Composition effect

The composition effect is the share of the change that results from the modification (or change) in the structure of the study population. In the case of our study, this effect is therefore the share of the change that would be attributable to the variation in the proportion of teenage mothers of different social categories from one period to another.

f) Behavioral or performance effect

Unlike the composition effect, the behavior effect is less mechanical. It indicates how much of the social change is attributed to the variation of the phenomenon in the various categories of the classification variable, whether they are at risk or not. The slightest decrease or increase in the phenomenon to be studied in any category can have an impact on the whole country.

This performance effect generates three other changes: baseline performance effect, differential performance effect and residual factors.

- *Basic performance*

It is the probability that all social categories of the classification variable, without distinction, have a fluctuation in their fertility levels. This risk comes from events or policies that affect all categories.

- *Differentiation performance*

It is exclusively a difference in performance related to a category of the classification variable.

- *Residual effect*

This is any change not explained by either the performance effect or the composition effect. These changes are very often attributable to spontaneous changes in some social phenomenon.

Décomposition simple

Simple decomposition identifies the immediate sources of social change by estimating the relative contribution of two or more components to that change. This contribution is of two kinds, including the performance effect (changes in group performance) and the composition effect (changes in the relative size of groups).

The use of this method requires that the variable or phenomenon to be studied be quantitative, aggregated, and gradual. And the formula looks like this:

$$Y_t = \sum w_{jt} y_{jt}$$

Y_t: is the national average of the variable.

Y_t: is the proportion of adolescent girls aged 15-19 who have achieved fertility according to the methods **j** of the classification variable

w_{jt}: is the proportion of women with at least one live birth according to the modalities **j** of the classification variable.

From this formula, the national change can be broken down as follows:

$$\Delta Y = \sum \overline{y_j} \Delta w_j + \text{ with and } \sum \overline{w_j} \Delta y_j \overline{y} = \frac{Y_{jt1}+Y_{jt2}}{2} \overline{w_j} = \left(\frac{W_{jt1}+W_{jt2}}{2}\right)$$

This method will be used in our work for both years (t1=2007 and t2=2014) and (t3=2017), to perceive the evolution of the fertility level and the sources behind this change. And for the classification variable, we used the education level and standard of living of adolescent girls.

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Advanced decomposition

Once the performance effect predominates, the estimation of the statistical relationship of this effect and the classification variables is done as follows:

$$y_j = \propto + \beta X_j + \mu_j$$

With:

$\propto$: called intercept, represents basic fertility (basic performance).

β : the effect of the classification variable

X_j: The increase in average parity associated with a unit increase in the classification variable.

μ_j: represents the error, which can also be interpreted as the relative outperformance/ underperformance of the group.

The change in the value between two periods is obtained as follows: y_i

$$\Delta y_j = \Delta\alpha + \bar{\beta}\Delta x_j + \bar{x}\Delta\beta + \Delta\mu_j$$

With:

$\bar{\beta}$: represents the average increase in the effects of the classification variable between the two periods.

In case the definitions of the categories of x do not change between years t and t', the second term of this equation is 0, and x is equal to x. and the equation will therefore be:

$$\Delta y_j = \Delta\alpha + x_j\Delta\beta + \Delta\mu_j$$

By inserting formula 3 into the first formula, we obtain

$$\left\{\sum \overline{y}_j \Delta w_j\right\} = \left\{\sum \overline{w}_j \Delta\alpha\right\} + \left\{\sum \overline{w}_j x \Delta\beta\right\} + \left\{\sum w_j \Delta\mu_j\right\}$$

Composition effect

Improvement of the basic health system(B1)

Effect of differentiation according to the standard of living or education of

Residual effect of other variables not considered(B3)

Performance/behaviour effect

Three subcomponents (B1), (B2) and (B3) emerge from this new, finer decomposition.

BIBLIOGRAPHIC REFERENCES

1. DIOP N. J. (1994), La Dynamique de la Fécondité des Adolescentes au Senegal, African Population Studies Vol 9, 1.
2. Dembélé B., 2004, Santé de la reproduction des adolescentes : Qu'est ce qui détermine l'initiation sexuelle prémaritale des filles au Burkina-Faso ? Communication at the Chair Quételet, Santé de la reproduction eu Nord et au Sud, de la connaissance à l'action, Louvain P23.
3. Enel C. and Querre M., 2006, la vulnérabilité des femmes face au VIH en République du Congo : Composantes des environnements à risque, in des grées du Loû A. and Ferry B. (ed5), Sexualité et procréation confrontées au SIDA dans les pays du Sud, Les Collections du CEPED ; pp 59-78.
4. De launay V. and Guillaume A, 2007, sexualité et mode de contrôle de la fécondité chez les jeunes en Afrique subsaharienne, in Adjamagbo A. Msellati P., santé de la reproduction et fécondité dans les pays du sud. Nouveau contexte et nouveaux comportements Academia Bruyant, pp 211-263.
5. Emima J., 2005, Situation résidentielle, scolarisation et mortalité des enfants selon la légitimité de leur naissance : une analyse du Cameroun, de la Centrafrique et de la République Démocratique du Congo. PhD thesis in Demography, Université catholique de Louvain, Département de Démographie 388p.
6. Gupta R, 2003 Gender, Sexuality and HIV a critical review of international scientific news on HIV and Hepatitis Viruses, N°87 P11.

7. Gueye M., Castlesand Kanaté M, 2001, timing of first intercourse among Malian adolescents: Implications for contraceptive us, International Family planning, perspectives Vol 27 N°2, pp 56-62.
8. Kobelembi F., 2005, Le comportement sexuel des adolescents à Bangui (RCA), Etude de la population Africaine, Vol 20 N°, pp 65-99.
9. Lhomond B., 2009 ;Similitudes et divergences : les premières relations sexuelles des filles et des garçons, in Dorlin E ; et Fassin E, (dir), Genre et sexualités, Paris PP 161-170.
10. Mondain N et Delaunay V. 2006, La vie avant le mariage : les grossesses prénuptiales chez les Sereer Siin au Sénégal in Association Internationale Des Démographes De Langue Française, actes de Enfants d'aujourd'hui, diversité des contextes, pluralité des parcours, Dakar, 10-13 décembre 2002, AIDELF/PUF, Paris, pp. 799-814.
11. Mayack N; 2014, Policy and family planning in Cameroon: what place for young people? Other part; Vol 2; No 70, P 115 - 128.
12. Moloua F. Fomena, Revenge M. 2004, Comprendre la sexualité précoce des adolescentes dans L'enfant en Centrafrique, pages 229 à 260.
13. Meslé F. Toulemon L and Véron J. 2011, dictionnaire démographique et des sciences de la population, Armand Colin, Page 528.
14. Nalwadda, G., Mirembe, F., Byamugisha, J. et al., 2010, Persistent high fertility in Uganda: young people recount obstacles and enabling factors to use of contraceptives. BMC Public Health 10, 530.
15. Rwenge 2002, Culture genre, comportements sexuels et MST/SIDA au Cameroun, Yaoundé Cahiers de l'IFORD ; N°28, 276p.
16. Rwenge M., 2004, Genre et sexualité des jeunes à Bafoussam et Mbalmayo, Cameroun, African population studies Vol 8, N°2, pp 145-163.
17. Rwenge M., 2012, Risk factors for non-use of condoms by adolescents and youth in Mbalmayo, Cameroon, African Journal Population studies, Vol 26; No 1; P 29.
18. Rwenge M., 2000, Risky Sexual Behavior Among Youth in Bamenda, Cameroon International Perspectives on Family Planning Special, pages 13-18 and 35.
19. Revenge M., 2010, De la pertinence de l'approche systémique d'explication de la sexualité à risque des adolescents et jeunes au Cameroun, Population studies, African Vol 24: N° 3 ; pp 211-237.
20. Rossier C., Sawadogo N et Soubeiga A., 2013, Sexualité prénuptiales, rapports de genre et grossesses non prévues à Ouagadougou, Population Vol 68 N°1 pp 97-122.
21. Simon D. Jean, Kiragu A., Toudeka A.S. et al.,2021, Être mère à l'adolescence à Haïti : un phénomène persistant et multifactoriel, Sexologies.
22. Talnan, E, Anoh A. et Zanou B., 2004, inégalités sociales et comportements sexuels à risque chez les jeunes en milieu urbain ivoirien, Etude de la population africaine supplément B ; Vol 19 ; 20p.
23. Talnan, E, Anoh A. et Zanou B, 2004, inégalités sociales et comportements sexuels à risque chez les jeunes en milieu urbain ivoirien, Etude de la population africaine supplément B ; Vol 19 ; 20p ;
24. Thiriat M.P, 2000, les pratiques matrimoniales au principe des systèmes de genre, Rapport de genre et questions de population et développement, II, Genre population et développement. Les pays du Sud Paris, INED, Dossier de recherches N°85 pp 81-94.
25. UNFPA, 2016, Why fighting child marriage and teen pregnancy is critical, p7.
26. UNFPA, 2012, The Status of Adolescents and Youth in Sub-Saharan Africa (Opportunities and Challenges) Report.

ANNEXES 1

Table 8: Distribution of the significance of explanatory variables by region

	EDS 2006	EDS 2011	EDS 2017
Individual characteristics of the adolescent	Age at first cohabitation	Age at first cohabitation	Age at first cohabitation
	Knowledge of contraception	Knowledge of contraception	Knowledge of contraception
	Knowledge of the ovulatory cycle	Knowledge of the ovulatory cycle	
	Age of the adolescent	Age of the adolescent	Age of the adolescent
	Age of first sexual intercourse	Age of first sexual intercourse	
	Educational level of the adolescent	Educational level of the adolescent	
		Ideal number of children	Ideal number of children
Household characteristics	Household size	Household size	Household size
	Gender of head of household	Gender of head of household	
	Relationship with the head of the household		Relationship with the head of the household
		Age group of household head	Age group of household head
		Household standard of living	
			Religion

Table 9: Contribution of the different explanatory factors _2007

Explanatory variables	EDS 2007	RANK 2007
Age at first cohabitation	24,0%	1
Age of the adolescent	4,2%	2
Age of first sexual intercourse	1,1%	3
Household size	1,0%	4
Knowledge of the ovulatory cycle	0,5%	5
Gender of head of household	0,5%	6
Educational level of the adolescent	0,3%	7

Table 10: Contribution of the different explanatory factors _2011

Explanatory variables	EDS 2011	RANK 2011
Age at first cohabitation	21,3%	1
Age of the adolescent	5,1%	2
Age of first sexual intercourse	5,4%	3
Knowledge of contraception	0,7%	4
Knowledge of the ovulatory cycle	0,7%	5
Age group of household head	0,7%	6
Household standard of living	5,1%	7
Educational level of the adolescent	4,1%	8
Ideal number of children	1,0%	9
Relationship with the head of the household	0,1%	10
Religion	0,3%	11
Gender of head of household	19,5%	12
Household size	0,6%	13

Table 11: Contribution of the different explanatory factors _2017

Explanatory variables	EDS 2017	RANK 2017
Age at first cohabitation	14,5%	1
Age of first sexual intercourse	11,2%	2
Age of the adolescent	5,4%	3
Relationship with the head of the household	1,7%	4
Religion	0,7%	5
Household size	0,7%	6
Age group of household head	0,5%	7
Ideal number of children	0,4%	8
Knowledge of contraception	0,2%	9
Educational level of the adolescent	0,1%	10

ANNEXES 2

III.3 Specification of the analysis variables

This section allows us to define the different variables that will be used in our study, i.e. the dependent variable and the independent variables.

III.3.1 Dependent variable

Our dependent variable is the fertility status of girls aged 15-19 years in 2007, 2011 and 2017 in Benin. This variable is captured in the DHS surveys from the variable V201: the total number of children born alive. The modalities of this variable have been grouped into two groups. These are no children (all those with 0 children born alive); at least one child (all those with one or more children born alive).

It can be defined as any pregnancy contracted before the age of 20 that exposes the woman to risks related to the immaturity of her body and to social and economic well-being. Using the DHS terminology, this will be any pregnancy occurring in an adolescent aged 15-19 years at the time of the survey. This concept will be captured by the fertility status of the adolescent.

III.3.2 Independent variables

In order to achieve the objectives that we set upstream, 14 independent variables were mobilized, some of which were recoded and others were constructed from those that already existed in the database.

Among the independent variables that have been recoded are:

III.3.2.1 Ethnicity

This variable was grouped into 11 modalities which are: Adja, Bariba, Dendi, Fon, Yoa, Lokpa, Betamaribe, Peulh, Yoruba, Other Beninese, Other nationalities

III.3.2.2 Knowledge of the ovulatory cycle

In order to measure the influence of knowledge of the ovulatory cycle on the fertility status of adolescents, we adopted a grouping of three modalities: 1. no knowledge; 2. doubtful knowledge; 3. good knowledge.

III.3.2.3 Knowledge of a contraceptive method

Knowledge of a contraceptive method was grouped into three categories: 1. no method; 2. traditional method; 3. modern method.

III.3.2.4 Age at first sexual intercourse

This age refers to when the girl had her first sexual intercourse. We have grouped it into three modalities: 1. have not yet had sexual intercourse; 2. at first union; 3. 8 to 15 years old; 4. 16 to 19 years old.

III.3.2.5 Level of education

We refer to the level that adolescent girls reach in the formal education system. This variable has been recoded into two modalities: 1. no level; 2. primary; 3. secondary and above.

3.2.6 Household standard of living

This variable is grouped into three modalities: 1. poor (very poor and poor); 2. average; 3. rich (very rich and rich).

In addition to these redesigned variables, another variable was created (i.e., composite variable), which is the degree of media exposure variable.

III.3.2.7 Degree of media exposure

Three variables contributed to its creation, including exposure to radio (V384A), television (V384B) and newspapers or magazines (V384C). Thus it was coded in four modalities: none; low; high; very high.

The rest of the variables were not modified, such as: gender of the head of the household, place of residence and province of residence.

II.3.8 Definition of other study concepts

II.3.8.1 Residence context

It refers to the environment in which the individual lives and will be understood through the region and the environment of residence of the adolescent. In the case of the home environment, the city contrasts with the village in terms of availability of infrastructure (sanitation, etc.), lifestyles and types of activities. The city also offers advantages in terms of urbanization and many other attractive factors such as: availability of jobs, health services. Decent housing, good schools, etc. This disparity between these two environments is also found between the different departments.

The above variables have been grouped into three main clusters. The following section presents these groups.

II.3.8.2 socio-economic characteristics

The socioeconomic environment includes any element that can contribute to the development of the adolescent's human capital. It includes conditions related to education, health, nutrition and financial opportunities (such as having an income) that surround the adolescent. As an operational variable, we have the proportion of weak households.

III.3.8.3 Household characteristics

It is a set of elements, norms, socio-cultural and economic values in a household that determine the behavior of adolescent girls with respect to fertility. They are determined by ethnicity, household standard of living, household size, and the gender of the head of household.

III.3.8.4 Individual characteristics of the adolescent

They refer to each of the cultural, social, physical or biological characteristics that distinguish an adolescent girl from others. It is also a set of elements that allows the girl to forge her own personality in order to differentiate herself from her peers and to conform to certain social rules or reject others. These will be captured by media exposure, education level, knowledge of the ovulatory cycle, knowledge of contraceptive methods, marital status, age at first intercourse and use of contraceptive methods.

Table 12: List of explanatory variables and their modalities

Variables	
Household size	1
Age at first cohabitation	2
Age of first sexual intercourse	3
Knowledge of contraception	4
Knowledge of the ovulatory cycle	5
Age group of household head	6
Educational level of the adolescent	7
Relationship with the head of the household	8
Place of residence	9
Ideal number of children	10
Religion	11
Gender of head of household	12
Household standard of living	13
Age of the adolescent	14

Table 12: Analysis variables

Residency context	Place of residence	Urban
		Rural
	Department	Alibori
		Borgou
		Coastal
Household characteristics	Ethnicity	Adja
		Bariba
		Dendi
		Fon
		Yoa, Lokpa
		Betamaribe
		Peulh
		Yoruba
		Other Beninese
		Other nationality
	Household standard of living	Poor
		Medium
		Rich
	Household size	Household with less than 6 individuals
		Household of 6 to 9 individuals
		Household of more than 10 individuals
	Gender of head of household	Male
		Female
	Age group of household head	15-19 years old
		20-29 years old
		30-39 years old
		40-49 years old

Individual characteristics of the adolescent	Level of education	No level
		Primary
		High school and up
	Age of the adolescent	15
		16
		17
		18
		19
	Relationship with the head of the household	CM/Wife or Co-Wife
		Girl
		Daughter-in-law
		Little girl
		Adopted daughter
		Sister
		No link
		Other parent
	Religion	Traditional
		Catholic
		Other Christians
		Muslim
		Without religion
	Knowledge of contraception	Yes
		No
	Knowledge of the ovulatory cycle	No knowledge
		Questionable knowledge
		Good knowledge
	Contraceptive practice	Yes
		No
	Marital status	No union
		In union
	Age at first cohabitation	Under 18 years old
		At least 18 years old
		Not in union
	Age at first sexual intercourse	Have not yet had sex
		From 8 to 15 years old
		From 16 to 19 years old
	Media exposure	No
		Low
		High
		Very high

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Knowledge, Attitude, and Perceptions about Depression among Clarke International University Students

Diana Nakayenga & Kisaakye Rebecca

ABSTRACT

Background: Depression is a widely spread global mental health problem, and continues to be among the most challenging health concerns among students. Globally, there are higher rates of depression among university students than the general population, even in Uganda.

Objective: This study was aimed at exploring the knowledge, attitude and perceptions about depression among Clarke International University students.

Methods: The study was descriptive in nature and was based on the cross-sectional design. It was conducted among 150 Clarke International University students who were randomly selected from the different courses offered at the university. Data was collected through self- administered questionnaire method using a well-designed and structured questionnaire.

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Knowledge, Attitude, and Perceptions about Depression among Clarke International University Students

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ABSTRACT

Background: Depression is a widely spread global mental health problem, and continues to be among the most challenging health concerns among students. Globally, there are higher rates of depression among university students than the general population, even in Uganda.

Objective: This study was aimed at exploring the knowledge, attitude and perceptions about depression among Clarke International University students.

Methods: The study was descriptive in nature and was based on the cross-sectional design. It was conducted among 150 Clarke International University students who were randomly selected from the different courses offered at the university. Data was collected through self-administered questionnaire method using a well-designed and structured questionnaire.

Results: Majority of the study respondents, 88(58.7%) were aged 20 – 25 years, and 98(65.3%) of them were female. All study respondents, 150(100.0%) had ever heard about depression. However, majority of them, 112(74.7%) were only partially knowledgeable about depression, with only 38(25.3%) of them having good knowledge about depression.

Majority, 97(64.7%) indicated that they would never admit to friends if they had depression, 129(86.0%) would never admit to colleagues if they had depression, while 75(50.0%) felt uncomfortable talking to a person with depression. Majority, 85(56.7%) had the perception that people with depression may feel guilty when they are not at fault; 91(60.7%) felt that depression leads to loss of confidence and poor self-esteem, while 77(51.3%) were of the view that people with depression often hear voices that are not there.

Conclusion: The study found that while awareness about depression was high among the university students, majority of them were only partially knowledgeable about this condition, and this negatively influenced their attitudes and perceptions about depression.

Recommendations: The university administration should put in place and support measures of improving knowledge about depression among university students, and government of Uganda, through the National Council for Higher Education, should come up a policy that compels universities and higher learning institutions to incorporate depression information dissemination into orientation programs for all students joining these institutions.

I. CHAPTER ONE: INTRODUCTION

1.1 Introduction

This chapter provides an introduction to the topic under study. It includes the background to the study, the problem statement, the research objectives, research questions, significance of the study and the conceptual framework for the study.

1.2 Background to the Study

Depression is widely a spread global mental health problem (Sarokhani et al., 2013), and continues to be among the most challenging health concerns among students (Kelly, Adams & Glazebrook, 2013). Globally, there are higher rates of depression among university students

London Journal of Medical and Health Research

than the general population (Ibrahim et al., 2013; Yusoff et al., 2013; Haldorsen, Bak, Dissing & Petersson, 2014) in both resource-rich settings (Hope & Henderson, 2014) and resource-constrained settings (Oppong & Andoh-Arthur, 2015; Brenneisen et al., 2016). Depression negatively impacts on the quality of life and academic potential of university students (Ibrahim et al., 2013). Students who suffer from depression tend to have low academic grades, are least active in classes and tend to report poor academic satisfaction (Chen et al., 2013). The global prevalence of depression is estimated to be above 35% among university students (Oppong & Andoh-Arthur, 2015; Othieno, Okoth, Peltzer, Pengpid & Malla, 2015; Brenneisen et al, 2016).

Unfortunately, depression as well as other psychological and mental problems among students are increasing globally (Field, Diego, Pelaez, Deeds & Delgado, 2012). In the United States for example, according to a national survey in 2005, 86% of university counselling centres reported an increase in serious mental health and psychological problems among university students (Gallagher, Weaver-Graham & Tylor, 2005), and even more recently, Mario (2020) reported that depression is on the increase among students in the United States of America. A recent study by the American Center for Collegiate Mental Health report (2020) indicated depression to be among the top problems affecting college students in the United States of America, with the American College Health Association (2020) reporting that over 40% of the students in the United States of America feel depressed. Depression rates have been reported to be high among students in other developing countries as well.

On the European continent, high levels of depression have been reported among Danish Medical students (Haldorsen et al., 2014), with female students having slightly higher rates of depression than their male counterparts (Ibrahim et al., 2013). On the Asian continent, Singh & Shekhar (2010) put the prevalence of depression among medical students of a private medical college in India to be 49.1%, while Chen et al. (2013) indicated that depression is common among Chinese University students, with similar rates to those of the non-student population in the Chinese city of Harbin. Similarly, in Malaysia, a study involving 743 Malaysian University students indicated high rates of depression among the students, almost all students having signs of depression (Yusoff et al., 2013). In developing countries, depression has been reported to be on the increase (Field et al., 2013), however the extent of depression among university students in these countries is not well known (January et al., 2018).

On the African continent, there is scarcity of information on the rates of depression among university students. Nonetheless, studies in some countries on the African continent have posted high rates of depression among university students. For example, a 2015 study at Addis Ababa University in Ethiopia put the prevalence of depression among university students at 27.7% (Berhanu, 2015). More recently in 2019, a study among medical students in Addis Ababa, Ethiopia, put the prevalence of co-morbid depression and anxiety to be at 21.20% and that for depression and anxiety to be 51.30% (Kebede, Anbessie & Ayano, 2019). Higher rates of depression among students have been reported in Kenya, an East African country. In 2014, a study by Othieno, Okoth, Peltzer, Pengpid & Malla (2014) posted an overall prevalence of moderate depressive symptoms at 35.7% (33.5% males and 39.0% females) and severe depression at 5.6% (5.3% males and 5.1% female) among university students in Kenya. In Uganda, there is generally scarcity of information about the prevalence of depression among university students.

However, a recent study in Uganda (Olum, Nakwagala & Odokonyero, 2020) put the prevalence of depression among Medical Students at Makerere University to be 21.5%. In the study area of Clarke International University (CIU), information is scanty about the rate of depression among students, but a recent report by the university students' counsellor indicates that depression is one of the conditions that affect students (Osire, 2021). Globally, the factors implicated in psychological morbidity among students include academic pressure, demanding

workloads (Elani et al., 2014), worry about own health (Borst, Frings-Dresen & Sluiter, 2016) and financial concerns (Wege, Muth, Li & Angerer, 2016). Other factors include exposure to patients' suffering in the case of medical students (Bertman, 2016), and student abuse and mistreatment (Cook, Arora, Rasinski, Curlin & Yoon, 2014).

Depression among students can adversely influence their academic performance and quality of life (Pillay, Ramlall & Burns, 2016) and may contribute to alcohol and substance abuse, decreased empathy, and academic dishonesty (Ip et al., 2016). However, studies have highlighted the existence of gaps in knowledge, attitude and perceptions which negatively affect people's response to and management of depression. For example, studies by Rong et al. (2011), Singh et al. (2017), and Thi, Tuyen, Dat, Thi, & Nhung (2019) highlighted gaps in knowledge and attitude of students in regards to depression. Further, Jorm et al. (2005), Geisner et al. (2015) and Huizen (2019) highlighted differing perceptions of students regarding depression. Nonetheless, none of these studies was conducted in Uganda or on the African continent. Therefore, this is a grey area, and for Clarke International University (CIU), despite reports of some students suffering depression, there is no information about the knowledge, attitude and perceptions of CIU students about depression.

1.3 Problem Statement

One of the most prevalent problems in mental health is depression, which is a serious health problem among the student population globally (Ibrahim, Kelly, Adams & Glazebrook, 2013). In Uganda, depression is among the most common chronic illnesses, with prevalence rates of up to 26 percent (Kinyanda et al., 2011), and a recent study among medical students at Makerere University put the prevalence of depression to be 21.5% (Olum et al., 2020). At CIU, there is no record of a study conducted to ascertain the extent of depression among university students.

However, a report by the students' counsellor at CIU indicates an increasing number of students suffering from depression, from four in 2018 to six in 2019 and nine in 2020 (Osire, 2021). This could be an indication of a bigger problem that has caused some students to miss classes as a result of depression (Osire, 2021).

The university put up a counselling office, which has been engaging and encouraging students to seek help when they notice signs and symptoms of depression. However, the cases of students suffering from depression have been increasing, with students missing classes as a result.

Probably, this is due to gaps in knowledge, attitude, and perceptions of students regarding depression. This motivated the researchers to conduct this study in order to inform measures that could be helpful in preventing depression among the students. This is essential because depression has the ability to damage a person's physical, psychological and social wellbeing (Kinyanda et al., 2011), as well affecting the academic performance of students.

1.4 Objectives of the Study

1.4.1 Main Objective

To explore the knowledge, attitude and perceptions about depression among Clarke International University students.

1.4.2 Specific Objectives

1) To determine the level of knowledge about depression among Clarke International University students.
2) To assess the attitudes about depression among Clarke International University students.
3) To explore the perceptions about depression among Clarke International University students.

1.5 Research Questions

1) How knowledgeable are the students at Clarke International University about depression?
2) What are the attitudes of Clarke International University students toward depression?
3) What are the perceptions of Clarke International University students about depression?

1.6 Significance of the Study

Depression is commonly being recognized as major health concern among students in universities (Othieno et al., 2014). An understanding of students' appreciation of depression is key for instigating measures to combat the burden associated with depression among students. This study finds its significance for a number of platforms, including healthcare, research, education, and policy.

1.6.1 Health Practice

Health workers play a key role in the prevention and management of depression. These study findings act as a source of information for those involved in nursing practice to use their platforms to advocate for the presence and availability of psychosocial services for the prevention and management of depression among students. The results of the study could be used as a basis for the establishment of university-based health care and support services for students suffering from depression and also for institution of prevention measures in order to ensure good quality of life among university students. Further, in this era of promotion of professional expertise, the study shall provide information that can be helpful to health cadres who can position themselves as consultants and therefore be valuable in the prevention, management and combating depression and associated challenges among university students.

1.6.2 Research

There has been little research about depression involving non-medical students in Uganda. The current study provides information which can be used to further research and create more understanding about the challenge of depression among university students. For example, the current study focuses on knowledge, attitudes and perceptions of university students about depression. Basing on the findings of the study, some researchers might be interested in undertaking research to understand the burden/ and or magnitude of depression as well as coping strategies among students.

1.6.3 Health Education

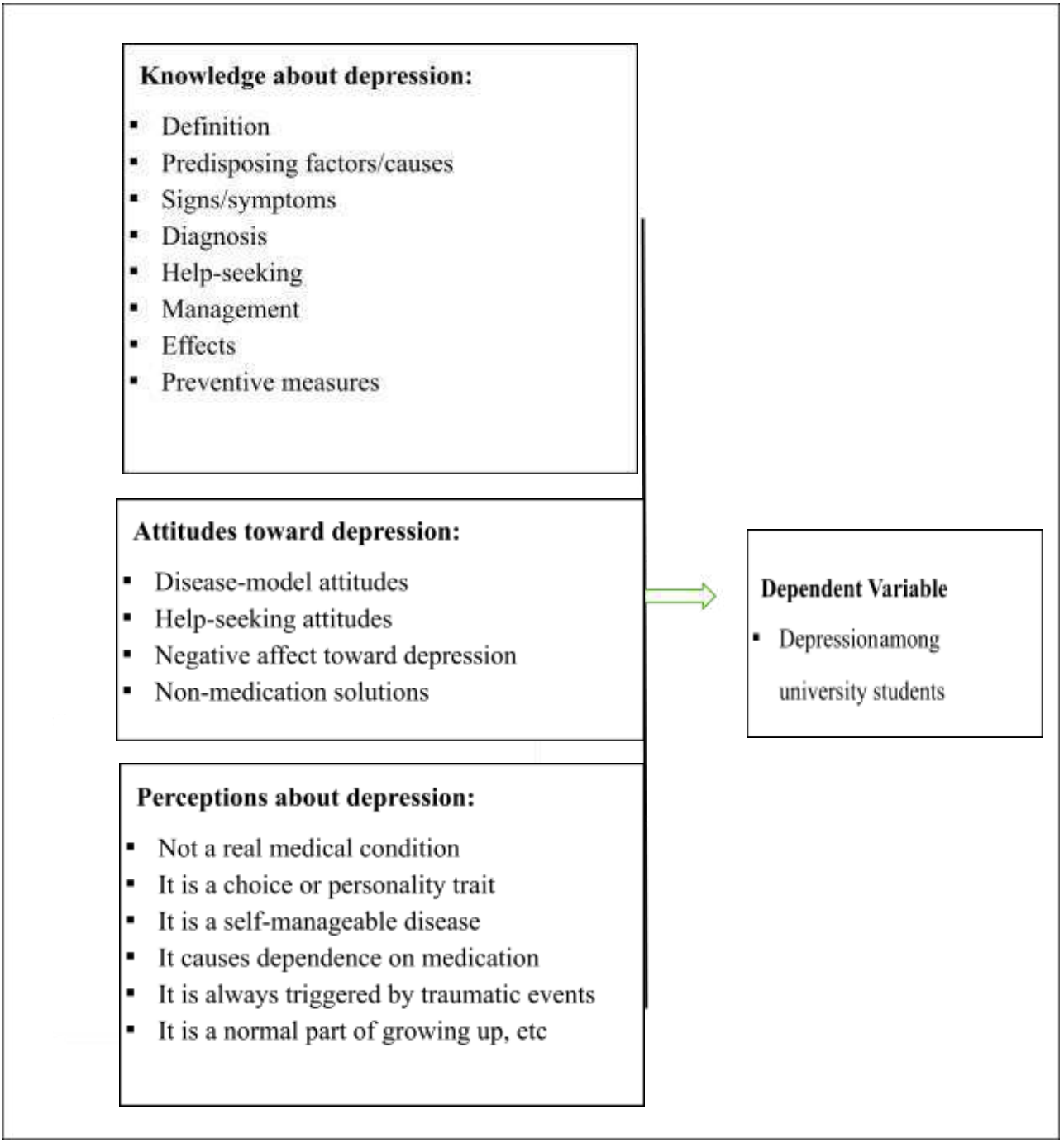
The Findings of the study creates awareness about the need for modification of training curriculum for pre-service healthcare students as well as formulation of capacity building programs for those in-service on how to have programs for the prevention and management of depression among university students. In essence, health workers need to be empowered with the right knowledge and skills for responding to the challenge of depression among university students, but also on how to prevent such challenges.

1.6.4 Policy

This study provides a wealth of information and knowledge that can be essential for instituting university/college-based mental health well-being programs and interventions that can be responsive to students' psychological needs, more-so preventing programs that are helpful for the prevention and management of depression among students. The study findings can be helpful to managers and policy makers to draft policies and others for preventing depression among students. Additionally, the study findings can be helpful to university managements and policy makers to create supportive environments for students who may be having mental health difficulties during their training.

1.7 Conceptual Framework

Figure 1 below shows the diagrammatic representation of the interaction between the different variables.



Source: Drafted by the researchers from literature reviewed

Figure 1: Conceptual Framework

According to figure 1 above, people's perceptions about depression depend on both knowledge and attitude towards depression. As such, a person is likely to have good perceptions about depression if they have good knowledge and attitudes toward depression while poor knowledge and attitude is likely to lead to bad perceptions.

II. CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter provides a review of literature in relation to knowledge, attitude and perceptions about depression according to other scholars and researchers around the globe.

2.2 Knowledge of Students About Depression

Studies have reported varying levels of depression among university students, with some posting moderate to high levels of knowledge and understanding about depression while others indicate low rates of knowledge about depression among university students. Further, some studies posted good to moderate levels of knowledge regarding some aspects of depression while reporting poor understanding about other aspects of depression among students.

For example, a study by Rong et al. (2011) about improving knowledge and attitudes towards depression: a controlled trial among Chinese medical students, it was obvious that the students who participated in the study had poor to moderate levels of knowledge about depression, with only 41.1% of them being knowledgeable about the predisposing factors or causes of depression, and only 38.9% being knowledgeable about the proper management for depression.

However, majority of them were knowledgeable about the definition of depression (63.2%), help-seeking for depression (58.9%), and the signs/symptoms of depression (61.1%). In terms of signs/symptoms of depression, more than three quarters (85.9%) mentioned at least three typical signs or symptoms of depression (Rong et al., 2011).

The Rong et al. (2011) study further depicted a moderate level of knowledge about depression as only 63.1% of the study respondents were in position to mention at least three common behaviours or experiences of persons with depression. Nonetheless, the commonest mentioned behaviors were: "suicidal thoughts or behaviour", "be unable to concentrate or have difficulty thinking", "suicidal thoughts or behaviour", "stop going out", and "withdrawal from close family and friends". Further, knowledge about depression was moderate as only 47% of the participants were aware of antidepressant medications, and only 22% knew of the possibility of returning to full recovery from depression (Rong et al., 2011).

In another study, Aina & Adebowale (2021) assessed the knowledge and prevalence of depression among students on College of Medicine University of Lagos, Nigeria, and reported that slightly more than a half (56.5% of 400 students) who participated in the study had good knowledge of depression but the rest had glaring gaps in knowledge about depression.

Slightly more than a half (52.5%) of them were able to give the correct definition of depression, and 58.9% could tell the signs/symptoms of depression. However, less than a half, 47.2% knew more than two dangers of depression, and only 27.8% of them could tell that depression was a significant mental health problem among university students which tends to be a main cause of disability and poor learning outcomes. Further, knowledge was scanty regarding the causes of depression, and only 18.5% of the students mentioned the connectedness of depression with stress as well as alcohol and drug abuse.

Other studies have also highlighted limited knowledge of students regarding depression. For example, a study involving students of Jimma University highlighted a generally low understanding about the predisposing factor for depression (Ahmed, Negash, Kerebih, Alemu & Tesfaye, 2020), while Students at Punjab University confused depression with anxiety and stress (Singh, Goel, Sharma, Bakshi, 2017). In Vietnam, students at Tra Vinh University had challenges giving the correct definition or predisposing factors for depression (Thi et al., 2019). However, majority of them acknowledged depression can be a big challenge that affects academic performance among university students, and agreed that seeking professional help is key for battling depression among university students (Thi et al., 2019).

2.3 Attitudes of Students Toward Depression

Studies have reported different levels of attitude of students about depression, with some studies indicating good attitude while others indicate poor attitude of students toward depression. For example, majority of students in the controlled trial among Chinese medical students (Rong et al. (2011) had poor attitude toward depression at baseline, with male students having higher scores reflecting more stigmatising attitudes compared with the female students (44.58, SD 7.07 vs. 42.66, SD 6.23, t = 2.07, d.f. = 203, P = 0.040). The study posted improvements in attitudes but with no significant association between attitude scores and age, course, year of study, area of origin, experience with depression, personal level of psychological distress, previous love/sexual relationships involved in, and use of alcohol or drugs. Other studies have also reported poor to good attitudes about depression among university students.

For example, according to the study by Yakushi et al. (2017) about usefulness of an educational lecture focusing on improvement in public awareness of and attitudes toward depression and its treatments, it was obvious that majority of the study participants expressed negative feelings in relation to disease-model attitudes, help-seeking attitudes, and on the negative affect toward depression. Most of them had a negative attitude toward depression as they would freely associate with people who have suffered from depression, while majority maintained social distance.

However, most of them expressed a positive attitude toward non-medication solutions for depression, and mostly preferred to seek help from family or friends as they considered this to be more helpful than medicalized treatment (Yakushi et al., 2017). This however, is an indication of poor attitude toward medical treatment of depression, and might be associated with poor help-seeking behavior for depression.

Negative attitude toward depression have also been observed in a study about public awareness about depression and suicide (Dumesnil & Verger, 2009). According to this, negative feelings about depression were observed in relation to disease-model attitudes, help-seeking attitudes, and on the negative affect toward depression. Further, negative attitudes toward depression were highlighted, expressed in personal stigma and social distance expressed toward persons who have suffered from depression, similar to what was reported in Japan than in other countries (Griffiths et al., 2006). Due to negative attitudes toward depression, Dumesnil & Verger (2009) recommended that public awareness campaigns should be conducted about depression in order to lead to modest improvement in public knowledge of and attitudes toward depression and suicide. However, positive attitudes about depression were observed concerning use of non-medication solutions for depression, similar to what was reported by (Yakushi et al., 2017).

Negative or stigmatizing attitudes toward people suffering from depression were also observed in a study involving psychology students despite their ability to recognize major depression than the general public (Economou et al., 2017). Such attitudes were shaped jointly by the public stigma attached to mental illnesses as well as by the content and delivery of mental health professionals' undergraduate training. According to the random sample of 167 undergraduate students who were recruited from the psychology department of one public university in Athens, majority of the study participants were ambivalent toward people suffering from depression. Further, to the majority, antidepressants were not deemed helpful to persons suffering from depression. The study participants being psychology students, their negative attitude toward depression and its treatment might render them incapable of understanding their patients, responding to their needs and providing them with appropriate help, while they may hinder their effective collaboration with psychiatrists.

In Cameroon, Mulango et al. (2018) conducted a study to assess the knowledge, attitudes and practices of primary health care providers about depression. The study found that generally, public healthcare providers had a mix of good and poor attitudes toward depression. Less than half (42.5%) of them disagreed that it is difficult to

differentiate unhappiness from a clinical depressive disorder that needs treatment. More than half (61.5%) perceived that antidepressants usually produce a satisfactory result in treatment of depressed patients. Further, nearly two thirds (67.3%) believed that most depressive disorders improve without medication. A vast majority (82.7%) endorsed the statement that public healthcare providers could be useful persons to support depressed patients, and more than 60% of the respondents agreed that if depressed patients need antidepressants or psychotherapy they are better off with psychiatrists.

2.4 Perceptions of Students About Depression

Studies have reported different perceptions of people about depression. For example, according to the studies in Australia and Japan by Jorm et al. (2005) about public beliefs about treatment and outcome of mental disorders, some community members had the perceptions that personal weakness is a cause of depression, overconfidence in self-awareness is a sign of depression, depression is a self-manageable disease, and that help for depression should be sought from family as opposed to general practitioners and psychiatrists. There were also perceptions that depression causes over-reliance /dependence on medication and over-expectations from counselling, which leads to stigmas related to depression. However, there were no differences in perceptions depending on age, gender or other personal characteristics of participants. Nonetheless, even recent studies have posted several perceptions and attributes about depression among university students.

According to Huizen (2019), people have a number of perceptions about depression. These include: some people discredit depression by claiming that it is not a real medical condition, and that it is some sort of choice or personality trait instead, medications are always the best way to treat depression, depression is always triggered by a traumatic event, depression is a normal part of growing up, all women develop depression after giving birth, men do not develop depression, a person will develop depression if a family member has it, taking antidepressants is a lifetime commitment, everyone experiences depression in the same way, depression and sadness or self- pity are the same thing, keeping busy cures depression, depression develops at a certain age, people with depression always seem sad or show obvious symptoms, depression is a natural part of aging, talking about depression makes it worse, and that herbal supplements can help treat depression.

In another study, Geisner et al. (2015) explored college students' perceptions of depressed mood. Of the 1,577 undergraduate students aged 18-24 who participated in the study through an online survey as part of a larger study on drinking and depressed mood, most students under-estimated the prevalence of sadness and depression experienced by other students, and this finding was especially true for male students. Conversely, most students over-estimated the prevalence of suicidal ideation. Students who reported experiencing a given feeling in the past two weeks perceived greater rates of the feeling among other students. Depression symptoms were associated with both greater perceived prevalence of sadness, depression and suicidal ideation, as well as correct and over-estimates of the prevalence of sadness and depression. Implications for future directions in prevention and interventions efforts are discussed.

In another study, Abbas et al. (2015) determined the prevalence of depression and its perceptions among undergraduate pharmacy students at the university of Sunderland, England, United Kingdom. Of the 433 students who participated in the study, a huge proportion (39.7%) of them believed that depressed individuals are a threat to the society. The majority disagreed with the idea that depressed individuals can never recover (N = 300, 69.3%) and no improvements despite treatment (N = 307, 70.9%). These findings are indicative of wrong perceptions about depression.

In Sri Lanka, Amarasuriya et al. (2015) conducted a study about the perceptions and intentions relating to seeking help for depression among medical undergraduates. According to this cross-sectional study which was conducted among 620 medical students and 4050 non-medical

undergraduates, only 50% of the study participants had the perception that professional help-seeking alone was needed to deal with depression. Other studies highlighted depression-related perceptions to include depression being the cause of suicide, and the perceptions that a person who has suffered from depression can never gain meaningful social relationships and psychological well-being. These perceptions were observed to impede the recovery process from depression (Griffiths et al., 2004; Gulliver et al., 2012; Drapalski et al., 2013).

III. CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter describes the study design, the study area, data sources, study population, inclusion and exclusion criteria, the sample size determination technique, the sampling procedures, study variables, data collection tools, data collection techniques, data management, quality control measures, data analysis techniques, ethical consideration, study limitations, and plan for dissemination.

3.2 Study Design

The study was descriptive in nature and was based on the cross-sectional research design. The study was descriptive because it summarized the findings using descriptive statistics of frequencies and percentages. The study was cross-sectional because it was conducted at the same point in time, which was favorable for the researchers' limited time and financial resources for conducting research and yet it leads to the realization of the study set objectives.

3.3 Study Area

The study was carried out at Clarke International University (CIU), which is located in Kampala City, Uganda. Formerly called International Health Sciences University, CIU is a private non-residential university in Uganda. The university has its main campus at 4686 St. Barnabas Road, Namuwongo, a southeastern section of Kampala, Uganda's capital and largest city. The university has an annex on campus, that is located at St. Agnes Academy, Muwayire Road, Kisugu, Kampala, Uganda. It has one institute and three functional schools. These include: The Institute of Health Policy and Management, the School of Nursing & Midwifery, the School of Allied Health Sciences, and the School of Business and Applied Technology.

The university offers a number of postgraduate degree courses, undergraduate degree courses, diploma courses, and certificate courses in the fields of nursing, clinical medicine and community health, healthcare management and administration, and others. This area was selected for this study because it has registered a sizeable number of students who have suffered from depression. It is therefore necessary to conduct this study to explore the knowledge, attitude and perceptions about depression among the student population in order to provide information that was helpful for instituting measures for preventing and combating depression among students.

3.5 Data Sources

The study utilized primary sources of data, and this was obtained from the study respondents who were the students of CIU.

Secondary sources of data were obtained from published articles and ministry of health publications.

3.6 Study Population

The study targeted students at CIU.

3.6.1 Inclusion Criteria

The study included students who were registered and attending lectures at CIU and consented in writing to take part in the study and those who were present at the University campus during the study.

3.6.2 Exclusion Criteria

The study excluded those who were not present at the university campus during the time of the study.

3.7 Sample Size Determination

The study sample size was determined using Kish (1965) formula for cross sectional study:

$$n = \frac{Z^2P(1-P)}{d^2}$$

Where:

Z - value at 95% confidence interval (1.96) d - is the margin of error (5%)
n – is the sample size.
P - Estimated proportion of factor of interest (in this case, students who have suffered from depression. At CIU, the proportion of students who have suffered from depression is not known. It was therefore taken to be 10% in order to get meaningful and workable sample size population. Hence, P = 10% or 0.1
Substituting the formula

$$n = 1.96^2 \times 0.1 \times \frac{(1- 0.1) = 138.2976}{0.05^2} \sim 138$$

However, 12 respondents were added (8.7%) to cater for attrition/non-response. Therefore, 150 respondents were considered for this study.

3.8 Sampling Procedures

This involved: sampling of representative institutes/schools, sampling of representative course, and sampling of study respondents.

3.8.1 Sampling of Institutes/Schools

All three institutes/schools at CIU were considered in the study.

3.8.2 Sampling of Courses

Each institute/school offers a number of courses, including graduate, undergraduate, diploma, and certificate courses. However, due to time and financial limitations, two representative courses were selected per institute. This was done by simple random sampling method in order to offer all courses in each selected institute/school an equal chance of being selected to participate in the study. Accordingly, the names of all the available courses in every selected institute/ school were written on small pieces of paper of the same size, color, shape, and texture. The pieces of paper were folded and then placed in a small box and covered. The box was shaken, and support staff was asked to pick a piece of paper from the box without returning. The box was shaken again, and a second piece of paper picked. The names on the picked pieces of paper were of those courses that had been selected to participate in the study per institute/ school. In total therefore, six courses were selected to participate in the study (2 per participating institute/school).

3.8.3 Sampling of Study Respondents

Since the study targeted 150 respondents, and six courses were participating in the study, 25 respondents (150/6) were selected per each of the selected courses. This was also done by simple random sampling method in order to offer all students in every selected course an equal chance of being selected to participate in the study. The updated student register shall be obtained from the university academic registrar, and this shall be used as the sampling frame.

Thereafter, the registration numbers of all students in every selected course were written on small pieces of paper of the same size, colour, shape, and texture. The pieces of paper were folded and then placed in a small box and covered. The box was shaken, and an assistant was asked to pick a piece of paper from the box without returning.

The box was shaken again, and a second piece of paper picked. This process was repeated until 25 pieces of paper were picked representing the number of students who had been picked to participate in the study. The registration numbers on the picked pieces of paper were of those students who had been selected to participate in the study course. In total therefore, six courses were selected to participate in the study (2 per participating institute/school). In case a selected student didn't meet the study criteria, a replacement was done in similar manner of simple random sampling described above.

3.9 Study Variables

This study was guided by two kinds of variables: independent variables and dependent variables.

3.9.1 Dependent Variable

This was the outcome variable and therefore it was the perceptions about depression, since it was assumed to result from knowledge and attitude about depression.

3.9.2 Independent Variables

These were the predictor or determinant variables. Therefore, they were the knowledge and attitude toward depression as these were assumed to lead to people's perception about depression.

3.10 Measurement of Variables

The study variables were assessed using questions from the International Depression Literacy Survey (IDLS). The IDLS was developed to investigate the knowledge about general and mental health issues, as well as attitudes and personal mental health experience. It consists of individual perceptions of major health and mental health problems in their countries, knowledge regarding the typical symptoms and common experience of depression and opinion on treatment and recovery. The utility of IDLS has been demonstrated among medical and non-medical students in both Australia and China (Rong et al., 2009; Hickie, Kelk & Medlow, 2010).

3.10.1 Measurement of Knowledge on Depression

In line with the IDLS, the level of knowledge about depression was assessed in three ways: 1) the proportion of students mentioning depression as a main health concern in Uganda (public health impact), 2) the proportion of students mentioning specific common behaviours or experiences for a person with depression (recognition), and 3) the proportion indicating that recovery is possible and that antidepressants are useful (outcome).

3.10.2 Measurement of Attitude Toward Depression

The students' attitudes toward depression was assessed using the Mental Illness: Clinician's Attitude's (MICA) scale which was specially designed for assessing the level of stigmatizing attitudes to mental illness and psychiatry among medical students (Kassam, Glozier, Leese & Thornicroft, 2010). The MICA scale has satisfactory internal consistency, face and construct validity. It includes 16 items. Each item is rated by using a six-point Likert scale from 1 to 6 indicating 'strongly agree', 'agree', 'somewhat agree', 'somewhat disagree', 'disagree', and 'strongly disagree', respectively. The MICA was adapted to this study with modification of the phrase "mental illness" being translated as "depression".

3.10.3 Measurement of Perception toward Depression

Perceptions about depression were measured through "true" or "false" answers to each of the perception questions.

3.11 Data Collection Techniques

Data from the respondents was collected through self-administered questionnaire method. In this process, the researchers distributed the data collection tool to the respondents who completed it and then returned to the researchers. This was because the respondents were in position to complete the questionnaire in the English language in which it was designed.

3.12 Data Collection Tools

Data was collected using semi-structured questionnaires for obtaining quantitative data for the study. The data collection tool contained closed -ended questions in order to enable the respondents to give specific responses to the questions. It was arranged in four sections.

Section A was used to obtain data on socio-demographic characteristics of respondents. Section B of the questionnaire comprised of the questions for assessing knowledge on depression.

Section C had questions for obtaining data on attitudes toward depression, and section D had questions for assessing the perceptions about depression. The data collection tool was organised in English language since the study respondents being university students, they were considered to be comfortable with reading and writing in English language. Therefore, no translation of the data collection tool was done.

3.13 Quality Control Measures

This was done to ensure that the research tools measure what is intended to be measured. Quality control measures include validity and reliability checks.

3.13.1 Reliability

According to Eisinga et al. (2012), reliability is the overall consistency of a measure. It is the degree to which the result of a measurement, calculation, or specification can be depended on to be accurate. In the current study, reliability was ensured through giving the research tools to the supervisor to ensure they are essential for obtaining the study objectives. Thereafter, the data collection tools were subjected to ethical review, where thereafter, the university research and ethics committee certified them for use in the study.

3.13.2 Validity

According to Brains and Manheim (2011), validity is the main extent to which a concept, conclusion or measurement is well-founded and likely corresponds accurately to the real world. In the current study, validity was ensured through pre-testing of the study questionnaire in order to ensure that the questions are easily understandable for the respondents. This pre-testing exercise was conducted at the nearby Kampala International University by giving the questionnaire to ten undergraduate students who completed the questionnaire and thereafter returned it to the researchers. After pre-testing, adjustments were made in the questionnaire in order to make modifications that made the questionnaire understandable before being applied on the main study respondents at CIU.

3.14 Data Management Measures

These include data editing and data coding.

3.14.1 Data Editing

On the respondents returning the completed questionnaire, the researchers went through it to assess its completeness. Further, after entry, data was cleaned prior to analysis.

3.14.2 Data Coding

The study used a pre-coded questionnaire in order to facilitate data entry and analysis.

3.15 Data Analysis

This was done by entering quantitative data into the computer-based Statistical Package for Social Sciences Research (SPSS), version 22 for window. All objectives were analysed using descriptive statistics of frequencies and percentages.

3.16 Ethical Considerations

These included the approval of the written proposal by the administration and the Research and Ethics Committee (REC) of CIU, and obtaining informed consent from the study respondents before allowing them to participate in the study. The respondents were assured of confidentiality, the reason as to why their names or other specific identifiers were not to be used in the study. They were assured that participation in study was free, and that they were at liberty to withdraw from the study at any stage if they so wished.

3.17 Covid-19 Mitigation

The study was to incorporate the Corona Virus Disease (COVID-19) Standard Operating Procedures (SOPs) set by the Ministry of Health. The researchers ensured to avoid overcrowding, and any other practices that fuel the spread of COVID-19. Other SOPs such as hand hygiene through proper hand washing or sanitizing and application of the face masks were ensured by both the researchers and respondents during the time of data collection.

3.18 Limitations of the Study

This was a cross sectional study relying on self-report by the respondents, some of whom could have given inaccurate information. Also, self-reported questionnaires could have been open to specific response biases. Further, the study was conducted in a private university, the study population could have been limited in terms of diversity of students admitted at the university.

Therefore, the study findings might have not been truly representative of the students and universities in Uganda.

3.19 Plan for Dissemination of Study Results

Approved copies of research dissertation are to be submitted to the administration of CIU.

Additionally, the researchers made efforts to disseminate the study findings through student seminars and conferences organised at the university, and also through other scientific seminars and conferences, both local and international. The researchers shall also ensure to publish the study findings in reputable journals of science and nursing.

IV. CHAPTER FOUR: STUDY RESULTS

4.1 Introduction

This study was conducted among 150 students of CIU to assess their knowledge, attitude, and perceptions about depression. The study respondents were randomly selected from six representative courses at the university. These included: bachelor of public health, bachelor of nursing science, diploma midwifery, diploma clinical medicine, diploma pharmacy, and diploma public health courses (Table 1).

4.2 Sociodemographic Characteristics of Respondents

Table 1: Sociodemographic Characteristics of Respondents

Characteristics	Frequency (n = 150)	Percent (%)
Age		
<20 years	27	18.0
20 - 25 years	88	58.7
>25 years	35	23.3
Gender		
Male	52	34.7
Female	98	65.3
Course of study		
Bachelor of Public Health	25	16.7
Bachelor of Nursing Science	25	16.7
Diploma Midwifery	25	16.7
Diploma Clinical Medicine	25	16.7
Diploma Pharmacy	25	16.7
Diploma Public Health	25	16.7
Year of study		
One	25	16.7
Two	50	33.3
Three	50	33.3
Four	25	16.7

Source: Primary Data

According to study results summarized in Table 1 above, majority of the study respondents, 88(58.7%) were aged 20 – 25 years while the least, 27(18.0%) were those below the age of 20 years. Majority, 98(65.3%) were female. An equal number of students, 25(16.7%) were selected from each of the representative courses of bachelor of public health, bachelor of nursing science,

diploma midwifery, diploma clinical medicine, diploma pharmacy, and diploma public health courses. An equal number of students, 50(33.3%) were in years 2 and 3 of study while an equal number, 25(16.7%) were in years 1 and 4 of study respectively.

4.3 Knowledge about Depression

All study respondents, 150(100.0%) had ever heard about depression, and were therefore further assessed for their knowledge by asking about specific components about depression, for example: knowledge of depression as a main health concern in Uganda, knowledge of signs or symptoms as well as typical behaviours and experiences of people with depression. They were also assessed for their knowledge about whether a person who has suffered depression can gain full recovery from the condition, and if they are aware of the existence of antidepressants for managing depression. Table 2 shows the summary of results.

Table 2: Respondents' Knowledge about Depression

Characteristics	Frequency (n = 150)	Percent (%)
Knows that depression is a main health concern in Uganda		
Yes	43	28.7
No	107	71.3
Knows some signs or symptoms of depression		
Yes	101	67.3
No	49	32.7
Knows at least three signs or symptoms of depression		
Yes	42	28.0
No	59	39.3
N/A (Doesn't know the signs/symptoms)	49	32.7
*Known signs/symptoms typifying a person with depression		
Being sad, down or miserable	27	18.0
Sleep disturbance	10	6.7
Being unhappy or depressed	36	24.0
Feeling tired all the time	3	2.0
Thinking that life is not worth living	9	6.0
Thinking of worthlessness	17	11.3
Thinking of being a failure	12	8.0
Having no confidence	5	3.3
Feeling frustrated	18	12.0
Feeling overwhelmed	21	14.0
N/A (Doesn't know the signs/symptoms)	49	32.7
*Typical behaviours and experiences of people with depression		
Unable to concentrate/have difficulty thinking	31	20.7
Stop doing things they enjoy	29	19.3
Withdraw from close family and friends	37	24.7
Have relationship or family problem	18	12.0
Stop going out	25	16.7
Become dependent on alcohol, drugs or sedatives	30	20.0
Have suicidal thoughts or behaviours	27	18.0
Not get things done at school/work	16	10.7
Lack of selfcare	26	17.3

N/A (Doesn't know the behaviours/experiences)			44	29.3
A person who has suffered depression can gain full recovery from the condition				
Yes			72	48.0
No			78	52.0
Antidepressants are useful in managing depression				
Yes			83	55.3
No			67	44.7

** Respondents were giving more than one answer*

According to the study results as indicated in Table 2 above, majority, 107(71.3%) of the study respondents were not aware that depression is a main health concern in Uganda, and only slightly above a quarter of them, 43(28.7%) were aware of this fact. Majority of them, 101(67.3%) knew some signs or symptoms of depression. However, only 42(28.0%) knew at least three signs or symptoms of depression. Being unhappy was the most mentioned sign/symptom of depression, followed by being sad, down or miserable, 27(18.0%), while the least known sign/symptom of depression was feeling tired all the time, 3(2.0%).

Most of them, 101(67.3%) were aware of the typical behaviours and experiences of people with depression, and the most mentioned behavior/ experience was withdrawal from close family and friends, 37(24.7%)

Furthermore, according to the study results as indicated in Table 2 above, slightly more than a half, 78(52.0%) of the study respondents were not aware that a person who has suffered depression can gain full recovery from the condition, and only slightly more than a half, 83(55.3%) were aware that antidepressants are useful in managing depression.

4.4 Level of Knowledge about Depression

The level of knowledge about depression was determined by finding out the number of study respondents who were in position to answer all knowledge questions correctly, those who answered them partially and those who didn't answer any of the knowledge questions correctly.

(n = 150)

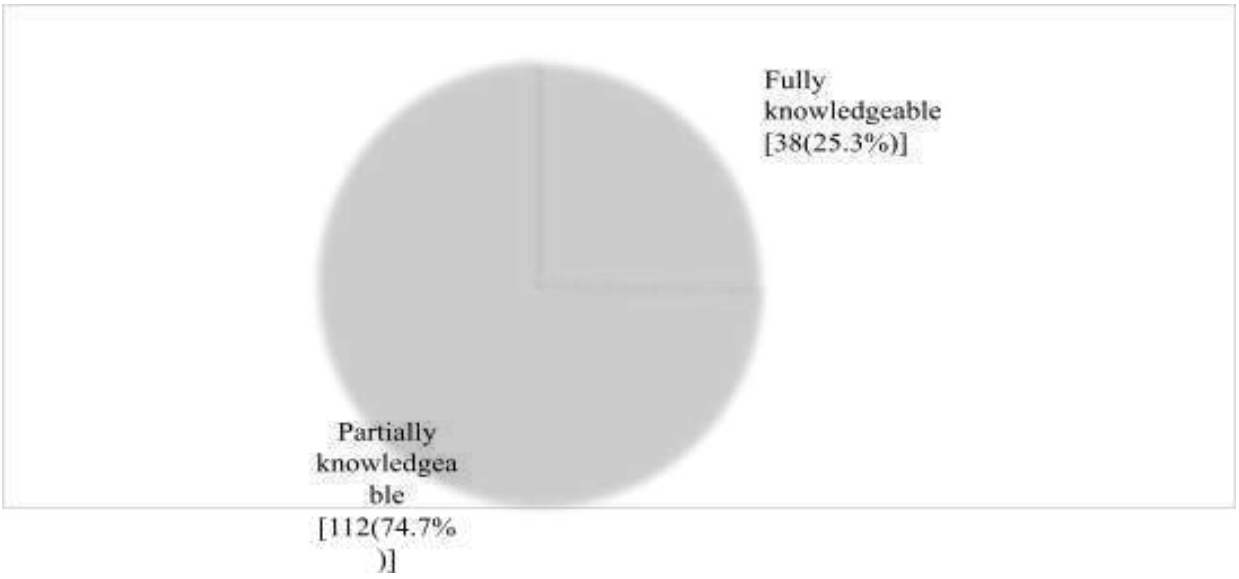


Figure 2: Respondents' Level of Knowledge about Depression

In the study results as indicated in Figure 2 above, slightly more than a quarter, 38(25.3%) of the study respondents were fully knowledgeable about depression can as they were in position to answer all knowledge questions correctly, while the majority of them, 112(74.7%) were only partially knowledgeable since they were in position to answer some but not all knowledge questions correctly. None of them wasn't knowledgeable since none failed to answer any of the knowledge questions correctly.

4.5 Attitude of Respondents Toward Depression

The respondents' attitude toward depression were measured through 16 items on the MICA scale using a six-point Likert scale indicating strongly agree (SA), agree (A), somewhat agree (SAG), somewhat disagree (SAD), disagree (D), and strongly disagree (SD). SA, A, and SAG indicate negative attitude toward the depression while SAD, D and SD indicate positive attitude toward depression in line with the assessment statements.

Table 3: Respondents' Attitudes Toward Depression (n = 150)

Statement	SA		A		SAG		SAD		D		SD	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
I just learn about depression when I have to, and would not bother reading additional material on it.	27	18.0	41	27.3	11	7.3	17	11.3	34	22.7	20	13.3
People with a severe depression can never recover enough to have a good quality of life.	24	16.0	29	19.3	21	14.0	26	17.3	25	16.7	25	16.7
Working in the depression clinic or field is not as respectable as other fields of health and social care	19	12.7	29	19.3	27	18.0	19	12.7	31	20.7	25	16.7
If I had depression, I would never admit this to my friends because I would fear being treated differently.	38	25.3	33	22.0	26	17.3	23	15.3	18	12.0	12	8.0
People with a severe mental illness are dangerous more often than not	36	24.0	31	20.7	31	20.7	17	11.3	19	12.7	16	10.7
Health/social care staff know more about the lives of people treated for depression than do family members or friends.	43	28.7	16	10.7	18	12.0	26	17.3	31	20.7	16	10.7
If I had depression, I would never admit this to my colleagues for fear of being treated differently.	47	31.3	42	28.0	40	26.7	8	5.3	9	6.0	4	2.7
Being a health/social care professional working on depression is not like being a real health/social care professional	28	18.7	29	19.3	16	10.7	25	16.7	27	18.0	25	16.7
If a senior colleague instructed me to treat people with depression in a disrespectful manner, I would follow their instructions.	9	6.0	15	10.0	6	4.0	45	30.0	39	26.0	36	24.0
I feel uncomfortable talking to a person with depression	22	14.7	27	18.0	26	17.3	27	18.0	21	14.0	27	18.0
A health/social care professional supporting a person with depression doesn't have to ensure that their physical health is assessed as well.	13	8.7	15	10.0	21	14.0	46	30.7	31	20.7	24	16.0
The public needs to be protected from people with severe depression	34	22.7	33	22.0	25	16.7	25	16.7	22	14.7	11	7.3
If a person with depression complained of physical symptoms (such as chest pain), I would attribute it to their mental illness.	36	24.0	21	14.0	19	12.7	21	14.0	29	19.3	24	16.0
General practitioners should not be expected to complete a thorough assessment for people with depression symptoms because they can be referred to a psychiatrist.	9	6.0	19	12.7	42	28.0	43	28.7	19	12.7	18	12.0
I would use the terms 'crazy', 'mad' etc. to describe to colleagues people with depression	3	2.0	16	10.7	13	8.7	47	31.3	44	29.3	27	18.0
If a colleague told me they had depression, I would not want to work with them.	21	14.0	27	18.0	25	16.7	24	16.0	28	18.7	25	16.7

The study results indicated in Table 3 above show that majority of the respondents had negative/poor attitudes toward depression. This can be observed in majority of them, 79(52.7%)

agreeing that they can just learn about depression when they have to and that they would not bother reading additional material on it [27(18.0%) strongly agreed; 41(27.3%) disagreed, and 11(7.3%) somewhat agree].

Furthermore, majority of them, 97(64.7%) indicated that if they had depression, they would never admit this to my friends because of fear of being treated differently [38(25.3%) strongly agreed, 33(22.0%) agreed, and 26(17.3%) somewhat agreed]. Similarly, majority of them, 129(86.0%) would never admit to colleagues if they had depression [47(31.3%) strongly agreed, 42(28.0%) agreed, and 40(26.7%) somewhat agreed].

Negative attitude toward depression can also be observed in a half of the respondents, 75(50.0%) indicating that they feel uncom- fortable talking to a person with depression [22(14.7%) strongly agreed, 27(18.0%) agreed, and 26(17.3%) somewhat agreed], and in 73(48.7%) not wanting to work with colleague with depression [21(14.0%) strongly agreed, 27(18.0%) agreed, and 25(16.7%) somewhat agreed] (Table 3).

4.5 Respondents' Perceptions About Depression

Respondents' perceptions were measured through "true" or "false" answers to each of the perception questions, with "true" answers indicating the perceptions that the respondents had about depression. Table 4 below shows the summary of results on respondents' perceptions about depression.

Table 4: Respondents' Perceptions About Depression

n = 150

Perception Statement	True		False	
	Freq.	%	Freq.	%
People with depression often speak in a rambling and disjointed way	17	11.3	133	88.7
People with depression may feel guilty when they are not at fault	85	56.7	65	43.3
Reckless and foolhardy behaviour is a common sign of depression	28	18.7	122	81.3
Loss of confidence and poor self-esteem may be a symptom of depression	91	60.7	59	39.3
Not stepping on cracks in the footpath may be a sign of depression	36	24.0	114	76.0
People with depression often hear voices that are not there	77	51.3	73	48.7
Sleeping too much or too little may be a sign of depression	83	55.3	67	44.7
Eating too much or losing interest in food may be a sign of depression	98	65.3	52	34.7
Depression affects your memory and concentration	102	68.0	48	32.0
Having several distinct personalities may be a sign of depression	11	7.3	139	92.7
People may move more slowly or become agitated as a result of their depression	57	38.0	93	62.0
Clinical psychologists can prescribe antidepressants	93	62.0	57	38.0
Moderate depression disrupts a person's life as much as multiple sclerosis or deafness	125	83.3	25	16.7
Most people with depression need to be hospitalised	117	78.0	33	22.0
Many famous people have suffered from depression	5	3.3	145	96.7
Many treatments for depression are more effective than antidepressants	16	10.7	134	89.3
Counselling is as effective as cognitive behavioural therapy for depression	44	29.3	106	70.7
Cognitive behavioural therapy is as effective as antidepressants for mild to moderate depression	21	14.0	129	86.0
Of all the alternative and lifestyle treatments for depression, vitamins are likely to be the most helpful	27	18.0	123	82.0

People with depression should stop taking antidepressants as soon as they feel better.	88	58.7	62	41.3
Antidepressants are addictive	24	16.0	126	84.0
Antidepressant medications usually work straight away	41	27.3	109	72.7

The study results in Table 4 above show that study respondents had different perceptions about depression. For example, majority of them, 85(56.7%) had the perception that people with depression may feel guilty when they are not at fault; 91(60.7%) had the perception that loss of confidence and poor self-esteem may be a symptom of depression; 77(51.3%) had the perception that people with depression often hear voices that are not there; 83(55.3%) had the perception that sleeping too much or too little may be a sign of depression; 98(65.3%) had the perception that eating too much or losing interest in food may be a sign of depression, and 102(68.0%) had the depression affects the memory and concentration of an individual.

Further, majority of them, 125(83.3%) had the perception that moderate depression disrupts a person's life as much as multiple sclerosis or deafness, and 117(78.0%) had the perception that most people with depression need to be hospitalised.

V. CHAPTER FIVE: DISCUSSION

5.1 Introduction

This chapter presents the discussion from the study about the knowledge, attitude and perceptions the students of CIU have about depression.

5.2 Knowledge about Depression

According to the study, majority of the students at CIU, 112(74.7%) are only partially knowledgeable about depression. Probably this was because the study considered all categories of students at the university, some of whom by nature of the courses they were undertaking (table 1) didn't have the opportunity of getting comprehensive information about depression. It could also probably be attributed to the fact that a half of them, 75(50.0%) were in year 1 or 2 of their study (table 1), whereby they might not have been taught about depression yet. This finding however, is not unique as other studies involving students have reported limited knowledge about depression. For example, Rong et al. (2011) in study among Chinese medical students reported moderate levels of knowledge about depression.

However, the Rong et al. (2011) study found a higher proportion (41.1%) of students being fully knowledgeable about depression than the 25.3% in the current study who had good knowledge about depression.

The difference in findings between the current study and that by Rong et al. (2011) can be attributed to differences in study settings with the Rong et al. (2011) study having been conducted in a more technologically advanced setting (China) which could have enabled the students to gain knowledge on depression than the participants in current study which was conducted in a third world country (Uganda). Also, the difference in findings can be attributed to the fact that the Rong et al. (2011) study was conducted among medical students, which could have given them an edge in gaining knowledge about depression than the current study which had a mix of students offering different courses, some of which might not equip learners with information on depression.

Further, current study finding of only about a quarter (25.3%) in the current study having good knowledge about depression is much lower than 56.5% of students from the College of Medicine, University of Lagos, Nigeria (Aina & Adebowale, 2021) who had good knowledge about depression, and this can also be attributed to the Aina & Adebowale (2021) study being conducted among medical students, which probably offered them the opportunity to learn about depression during their course lessons. However, on signs/ symptoms of depression, the current study found that majority, 101(67.3%) of the current study

that majority, 101(67.3%) of the current study respondents knew some signs or symptoms of depression, slightly higher than the 58.9% who could tell the signs/symptoms of depression in the study by (Aina & Adebowale, 2021). This is probably an indication that students still have gaps in understanding about depression even when they are undertaking medical courses, thereby calling upon university managements to improve information dissemination measures for students in order to improve knowledge and understan- ding about depression.

In the current study, majority, 107(71.3%) of the study respondents were not aware that depression is a main health concern in Uganda.

This can probably be attributed to their generally moderate knowledge about depression. However, studies in other settings have reported similar settings. For example, Aina & Adebowale (2021) in a study involving students at the College of Medicine in the University of Lagos, Nigeria, reported that only 27.8% of the students were aware that depression was a significant mental health problem in their country. These findings underscore the need for university students to interest their students into taking keen interest in learning about the happenings in their country environments, not only in relation to depression, but other health conditions that can have great negative impact on the students or the general population.

5.3 Attitude about Depression

The study found a relatively poor attitude of students toward depression. For example, majority of them, 97(64.7%) indicated that they would never admit to friends if they had depression; 129(86.0%) would never admit to colleagues if they had depression; 75(50.0%) felt uncomfortable talking to a person with depression; and 73(48.7%) did not want to work with colleagues who have depression (table 3).

These are all indicators of negative attitude toward depression, and could be attributed to limited knowledge and understanding about depression. This finding is supported by the other studies, such as that by Dumesnil & Verger (2009), Rong et al. (2011) Yakushi et al. (2017), which also reported negative attitudes of university students toward depression.

The negative feelings about depression were an indication of poor understanding about depression, and had the implication that university students might subject their colleagues struggling with depression to negative treatment instead of playing a supportive role. This in essence calls for the intervention of the university administration to support awareness creation about depression among university students so as to improve their appreciation of this condition, foster prevention of suffering from the condition, and improve support for those who suffer from this condition as well as tackling and addressing its negative among students.

5.4 Perceptions about Depression

Study respondents had different perceptions about depression (Table 4), with majority of them, 85(56.7%) having the perception that people with depression may feel guilty when they are not at fault; 91(60.7%) had the perception that loss of confidence and poor self-esteem may be a symptom of depression; 77(51.3%) had the perception that people with depression often hear voices that are not there; 83(55.3%) had the perception that sleeping too much or too little may be a sign of depression; 98(65.3%) had the perception that eating too much or losing interest in food may be a sign of depression, and 102(68.0%) had the depression affects the memory and concentration of an individual.

These findings are indicative of negative perception about depression, and could be the results of their limited knowledge and as well as poor attitude toward depression. Their limited knowledge and poor attitude could have led to poor understanding about depression, thereby causing these negative perceptions about the condition.

Negative perceptions about depression have also been reported by other studies, such as the one by Huizen (2019) which also reported university students as having the perceptions that depression those suffering from depression feel

guilty when they are not at fault, lose interest in food, or hear voices that might not be there.

Similarly, Geisner et al. (2015) reported university students as having perceptions that those suffering from depression have poor self-esteem, can eat too much, and have trouble concentrating. These are negative perceptions, and can be attributed to limited understanding about depression, and have the potential of negatively influencing students' support to their colleagues suffering with depression, thereby impeding the recovery process from the condition.

These findings are further an indication of the need for university authorities to consider improving awareness creation on depression for their students. This is key for enabling students to play a preventive role in regards to depression, and also offer support to those struggling with the condition.

VI. CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The study found that while awareness about depression was high among the university students, majority of them are only partially knowledgeable about this condition. Their knowledge was generally moderate about depression, which negatively influences their attitude and perceptions about depression. As such, majority of them had negative attitudes and perceptions about depression.

6.2 Recommendations

Basing on the study findings, the researchers hereby make the following recommendations:

1. The university administration should put in place and support measures of improving knowledge about depression among university students. This can be done through conducting routine depression awareness creation clinics, setting up depression support-clubs that can be used as platforms for improving information dissemination and support to those suffering from depression, and through conducting depression information dissemination lectures. This is likely to lead to improvements in students' understanding about depression, thereby improving their attitudes and perceptions toward this condition.
2. The limited knowledge, coupled with negative attitudes and perceptions about depression found in the current study might imply that the students could be silently suffering with this condition. Therefore, the university administration should, in liaison with experts, consider undertaking a depression screening exercise with the aim of identifying and supporting those who might be suffering from depression.
3. The Government of Uganda, through the National Council for Higher Education, should come up with a policy that compels universities and higher learning institutions to incorporate depression information dissemination into orientation programs for all students joining these institutions. This is anticipated to lead to improved understanding of students about depression, which might result in their improvements in attitudes and perceptions about depression.

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Abbreviations/Acronyms

CIU:	Clarke International University
COVID:	Corona Virus Disease
IDLS:	International Depression Literacy Survey
LMICs:	Low- and middle-income countries
MICA:	Mental Illness: Clinician's Attitudes
MoH:	Ministry of Health
SOP :	Standard Operating Procedures
SPSS:	Statistical Package for Social Sciences Research
REC:	Research Ethics Committee

Operational Definitions

Attitude: Refers to the person's settled way of thinking or feeling about depression.

Depression: A mental health disorder characterised by persistently low mood or loss of interest in activities, causing significant impairment in daily life.

Knowledge: The familiarity, awareness, or what a person understands about depression.

Perception: The way in which a person regards, understands, interprets or takes depression to be.

REFERENCES

1. Abbas, A., Syed, A.R., Rabiya, H., Aqeel, N., Khan, M., Bhutto, A., Khan, Z. and Mannan, Z. (2015). 'The prevalence of depression and its perceptions among undergraduate pharmacy students', Pharmacy Education, 15 (1), pp. 57 – 63.
2. Ahmed, G., Negash, A., Kerebih, H., Alemu, D. and Tesfaye, Y. (2020). 'Prevalence and associated factors of depression among Jimma University students. A cross-sectional study', Int J Ment Health Syst, 14(1), pp. 52. https://doi.org/10.1186/s13033-020-00384-5
3. Aina, B.A. and Adebowale, D.K. (2021). 'Knowledge and prevalence of depression among students on College of Medicine University of Lagos', European Journal of Public Health, Volume 30, Issue Supplement _5.ckaa166.1048, https://doi.org/10.1093/eurpub/ckaa166.1048.
4. Amarasuriya, S.D., Jorm, A.F. and Reavley, N.J. (2015). 'Perceptions and intentions relating to seeking help for depression among medical undergraduates in Sri Lanka: a cross-sectional comparison with non-medical undergraduates', BMC Med Educ 15(1), pp. 162. https://doi.org/10.1186/s12909-015-0453-8.
5. American Center for Collegiate Mental Health report (2020). 'The state of college student mental health from U.S. and international college counseling centers during the 2019-20 academic year', https://ccmh.psu.edu/annual-reports.
6. American College Health Association (2020). 'Mental Health Report', https://www.acha.org/ACHA/Resources/Topics/MentalHealth.aspx.
7. Berhanu, Y. (2015). 'Prevalence of depression and associated factors among Addis Ababa university students, Addis Ababa, Ethiopia', J Multidiscipline Res Healthcare, 2(1), pp. 73–90.
8. Bertman, S.L. (2016). 'Facing death: images, insights, and interventions: a handbook for educators, healthcare professionals, and counsellors', Washington; Taylor & Francis, p. 227.
9. Borst, J.M., Frings-Dresen, M.H.W. and Sluiter, J.K. (2016). 'Prevalence and incidence of mental health problems among Dutch medical students and the study-related and personal risk factors: a longitudinal study', Int J Adolesc Med Health, 28(4), pp. 349 - 355.
10. Brains, W. and Manheim, R. (2011). 'Empirical Political Analysis 8th edition', Boston, MA: Longman p. 105.
11. Brenneisen, M.F., Souza, S.I., Silveira, P.S.P., Itaqui, L.M.H., de Souza, A. and Campos, E.P. (2016). 'Factors associated to depression and anxiety in medical students: a multicenter study', BMC Med Educ., 16(1), pp. 282.
12. Chen, L., Wang, L., Qiu, X. H., Yang, X. X., Qiao, Z. X., Yang, Y. J. and Liang, Y. (2013). 'Depression among Chinese university students: Prevalence and socio-demographic correlates', PloS one, 8(3), pp. E58379.

13. Cook, A.F., Arora, V.M., Rasinski, K.A., Curlin, F.A. and Yoon, J.D. (2014). The prevalence of medical student mistreatment and its association with burnout. Acad Med J Assoc Am Med Coll., 89(5), pp. 749–54.
14. Drapalski, A.L., Lucksted, A., Perrin, P.B., Aakre, J.M., Brown, C.H., DeForge, B.R. and Boyd,
15. J.E. (2013). 'A model of internalized stigma and its effects on people with mental illness', Psychiatr Serv., 64(3), pp. 264-9.
16. Dumesnil, H. and Verger, P. (2009). 'Public awareness campaigns about depression and suicide: a review', Psychiatr Serv., 60(9), pp. 1203-13.
17. Eisinga, R., Te-Grotenhuis, M. and Pelzer, B. (2012). 'The reliability of a two-item scale: Pearson, Cronbach or Spearman-Brown', International Journal of Public Health, 58(4), pp. 637–642. doi:10.1007/s00038-012-0416 -3.
18. Economou, M., Peppou, L., Geroulanou, K., Kontoangelos, K., Prokopi, A., Pantazi, A., Zervakaki, A. and Stefanis, C. (2017). 'Attitudes of psychology students to depression and its treatment: Implications for clinical practice', Psychology, Medicine. 17(2), pp. 81 – 86. DOI:10.22365.
19. Elani, H.W., Allison, P.J., Kumar, R.A., Mancini, L., Lambrou, A. and Bedos, C. (2014). 'A systematic review of stress in dental students', J Dent Educ, 78(2), pp. 226–42.
20. Field, T., Diego, M., Pelaez, M., Deeds, O. and Delgado, J. (2012). 'Depression and Related Problems in University Students', College Student Journal, 46(1), pp. 6
21. Gallagher, R. P., Weaver-Graham, W. and Taylor, R. (2005). 'National Survey of Counselling Center Directors', Alexandria, VA: International Association of Counselling Centers.
22. Geisner, I.M., Kirk, J.L., Mittmann, A.J., Kilmer, J.R. and Larimer, M.E. (2015). 'College Students' Perceptions of Depressed Mood: Exploring Accuracy and Associations', Prof Psychol Res Pr., 46(5), pp. 375-383. DOI: 10.1037/pro0000039
23. Griffiths, K.M., Christensen, H., Jorm, A.F., Evans, K. and Groves, C. (2004). 'Effect of web-based depression literacy and cognitive-behavioural therapy interventions on stigmatising attitudes to depression: Randomised controlled trial'. The British Journal of Psychiatry, 185(1), pp. 342- 349.
24. Griffiths, K.M., Nakane, Y., Christensen, H., Yoshioka, K., Jorm, A.F. and Nakane, H. (2006). 'Stigma in response to mental disorders: a comparison of Australia and Japan'. BMC Psychiatry. 6, pp. 21.
25. Gulliver, A., Griffiths, K.M., Christensen, H., MacKinnon, A., Calear, A.L., Parsons, A., Bennet, K., Batterham, P.J. and Stanimirovic, R. (2012). 'Internet-Based Interventions to Promote Mental Health Help-Seeking in Elite Athletes: An Exploratory Randomized Controlled Trial', Journal of Medical Internet Research, 14, pp. 69.
26. Haldorsen, H., Bak, N. H., Dissing, A. and Petersson, B. (2014). 'Stress and symptoms of depression among medical students at the University of Copenhagen', Scandinavian journal of public health, 42(1), pp. 89-95.
27. Hess, S.G., Cox, T.S., Gonzales, L.C., Kastelic, E.A., Mink, S.P., Rose, L.E. and Swartz, K.L (2004). 'A Survey of Adolescents' Knowledge About Depression', Archives of Psychiatric Nursing, Vol. XVIII, No. 6: pp 228-234
28. Hickie, I.B., Kelk, N. and Medlow, S. (2010). 'Distress and depression among Australian law students: incidence, attitudes and the role of universities', Syd Law Rev. 32 (1), pp. 113-122.
29. Hope, V. and Henderson, M. (2014). 'Medical student depression, anxiety and distress outside North America: a systematic review', Med Educ., 48(10), pp. 963–79.
30. Huizen, J. (2019). 16 myths about depression. https://www.medicalnewstoday.com/articles /32722.
31. Ibrahim, A.K., Kelly, S.J., Adams, C.E. and Glazebrook, C. (2013). 'A systematic review of studies of depression prevalence in university students', J Psychiatr Res.; 47(3), pp. 391–400.
32. Ip, E.J., Nguyen, K., Shah, B.M., Doroudgar, S. and Bidwal, M.K. (2016). 'Motivations and predictors of cheating in pharmacy school', Am J Pharm Educ., 80(8), pp. 133.

33. January, J., Madhombiro, M., Chipamaunga, S., Ray, S., Chingono, A. and Abas, M. (2018). 'Prevalence of depression and anxiety among undergraduate university students in low- and middle-income countries: a systematic review protocol', Syst Rev 7(1), pp. 57. https://doi.org/10.1186/s13643-018-0723-8.
34. Jorm, A.F., Nakane, Y., Christensen, H., Yoshioka, K., Griffiths, K.M. and Wata, Y. (2005). 'Public beliefs about treatment and outcome of mental disorders: a comparison of Australia and Japan', BMC Med., 3(1), pp12.
35. Kassam, A., Glozier, N., Leese, M. and Thornicroft, G. (2010). 'Development and responsiveness of a scale to measure clinicians' attitudes to people with mental illness (medical student version)'. Acta Psychiatr Scand., 122(2), pp. 153-61. DOI: 10.1111/j.1600-0447.2010.01562.x.
36. Kebede, M.A., Anbessie, B. and Ayano, G. (2019). 'Prevalence and predictors of depression and anxiety among medical students in Addis Ababa, Ethiopia'. Int J Ment Health Syst, 13(1), pp. 30 https://doi.org/10.1186/s13033-019-0287-6.
37. Kish, L. (1996). 'A conversation with Leslie Kish', Statistical Science, 11(1). DOI: 10.1214/ss/1032209665.
38. Kinyanda, E., Woodbum, P., Tugumisirize, J., Kagugube, J., Ndyanabangi, S. and Patel, V. (2011). 'Poverty, Life Events and the Risk for Depression in Uganda'. PMC. 2(1), pp. 11.
39. Mario, A. (2020). 'Depression in University Students: Causes and Statistics'. https://infolific.com/health-and-fitness/depression-in-university-students-causes-and-statistics.
Mulango, I.D., Atashili, J., Gaynes, B.N. and Njim, T. (2018). 'Knowledge, attitudes and practices regarding depression among primary health care providers in Fako division, Cameroon', BMC Psychiatry, 18, pp. 66. https://doi.org/0.1186/s12888-018-1653-7.
40. Olum, R., Nakwagala, F.R. and Odokonyero, R. (2020). 'Prevalence and Factors Associated with Depression among Medical Students at Makerere University, Uganda', Adv Med Educ Pract., 12(11), pp. 853-860. doi:10.2147/AMEP.S278841. eCollection 2020.
41. Oppong, A.K. and Andoh-Arthur, J. (2015). 'Prevalence and determinants of depressive symptoms among university students in Ghana'. J Affect Disord.; 171(1), pp. 161–6.
42. Othieno, C.J., Okoth, R., Peltzer, K., Pengpid, S. and Malla, L.O. (2015). 'Risky HIV sexual behaviour and depression among University of Nairobi students', Ann General Psychiatry, 14(1), pp. 16.
43. Othieno, C.J., Okoth, R.O., Peltzer, K., Pengpid, S. and Malla, L.O. (2014). 'Depression among university students in Kenya: prevalence and sociodemographic correlates', J Affect Disord., 165(1), pp. 120-5. doi:10.1016/j.jad.2014.04.070. Epub 2014 May 4.
44. Pillay, N., Ramlall, S. and Burns, J.K. (2016). 'Spirituality, depression and quality of life in medical students in KwaZulu-Natal', South Afr J Psychiatry, 22(1), pp. 4.
45. Rong, Y., Luscombe, G.M., Davenport, T.A., Huang, Y., Glozier, N. and Hickie, I.B. (2009). 'Recognition and treatment of depression: a comparison of Australian and Chinese medical students', Soc Psychiatry Psychiatr Epidemiol., 44(8), pp. 636-42. 10.1007/s00127-008-0471-5.
46. Rong, Y., Glozier, N., Luscombe, G.M., Davenport, T.A., Huang, Y. and Hickie, I.B. (2011). 'Improving Knowledge and Attitudes towards Depression: a controlled trial among Chinese medical students', BMC Psychiatry, 11(1), pp. 36 https://doi.org/10.1186/1471-244X-11-36.
47. Sarokhani, D., Delpisheh, A., Veisani, Y., Sarokhani, M. T., Esmaelimanesh, R. and Sayehmiri, K. (2013). 'Prevalence of Depression among University Students: A Systematic Review and Meta- Analysis Study'. Depression research and treatment, 2(1), pp. 13.
48. Singh, A. and Shekhar, L. (2010). 'Prevalence of depression among medical students of a private medical college in India', Online J Health Allied Sci., 9(4), pp. 8.
49. Singh, M., Goel, N.K., Sharma, M.K. and Bakshi, R,K. (2017). 'Prevalence of Depression, Anxiety, and Stress among

Students of Punjab University, Chandigarh', Natl J Community Med., 8(11), pp. 666–671.
50. Thi, N., Tuyen, H., Dat, T.Q., Thi, H. and Nhung, H. (2019). 'Prevalence of depressive symptoms and its related factors among students at Tra Vinh University, Vietnam in 2018', AIMS Public Heal., 6(1), pp. 307–319.
51. Wege, N., Muth, T., Li, J. and Angerer, P. (2016). 'Mental health among currently enrolled medical students in Germany', Public Health, 132(1), pp. 92–100.
52. Yakushi, T., Kuba, T., Nakamoto, Y., Fukuhara, H., Koda, M., Tanaka, O. and Kondo, T. (2017). 'Usefulness of an educational lecture focusing on improvement in public awareness of and attitudes toward depression and its treatments', BMC Health Serv Res, 17(1), pp. 126. https://doi.org/10.1186/s12913-017-2071-0.
53. Yusoff, M.S.B., Abdul-Rahim, A.F., Baba, A.A., Ismail, S.B., Mat-Pa, M.N. and Esa, A.R. (2013). 'Prevalence and associated factors of stress, anxiety and depression among prospective medical students', Asian journal of psychiatry, 6(2), pp. 128-133.

APPENDICES

APPENDIX I: INFORMED CONSENT

Introduction

Hello, my name is Diana Nakayenga. My colleague, Rebecca Kisaakye, and I would like to invite you to participate in this research study which is for academic purposes only.

Objectives

This study seeks to assess the Knowledge, Attitude, And Perceptions About Depression Among Clarke International University Students

Procedures

You are being asked to complete a questionnaire which will take about 20 or 30 minutes. I will give you the questionnaire which you will complete and then return to me.

Risks for participating in the study

There are assumed risks for you when you participate in this study.

Possible benefits

The information collected may be helpful designing strategies for preventing and managing depression among university students.

Your rights as a participant

Your participation will be entirely voluntary. You are free to stop the interview at any time without giving any reason.

Confidentiality

All your responses will be confidential. The researchers will assign a unique identification number, so that your name is not linked to the answers that you give. The results of the study will be presented in a respectful manner, and information that could enable anyone to identify you personally will be reported.

Questions and contacts

If you have any questions for me, about the study or the consent document, please ask before signing, and I will do my best to answer them. You will receive a copy of this consent form if you like. If you have additional questions or if you need to discuss any other aspect of the study, you can contact the researcher at +256 779450390.

STATEMENT OF INFORMED CONSENT

Please tick the box which best describes your assessment of understanding of the above informed consent document:

- I have read the above informed consent document and understand the information provided to me regarding participation in the study and benefits and risks. I give consent to take part in the study and will sign the following page.
- I have read the above informed consent document, but still have questions about the study; therefore, I do not yet give my full consent to take part in the study.

Signature/thumbprint of Person Taking Part in Study Date: _____

Name of Person Taking Part in Study _____

APPENDIX II: QUESTIONNAIRE

Questionnaire for Determining Knowledge, Attitude, and Perceptions About Depression Among Clarke International University Students

Respondent Institute/School:.....

Section A: Sociodemographic Characteristics

- What is your age in complete years?
- What is your gender? Male ( ) Female ( )
- What is your course of study?
- In which year of study are?

Section B: Knowledge About Depression

- Have you ever heard about depression? Yes ( ) No ( )

If "Yes", continue with the following questions; if "No" please stop here

- Do you think that depression as a main health concern in Uganda? Yes ( ) No ( )
- What are some of the signs or symptoms typifying a person with depression? Tick as many as apply.
  - Being sad, down or miserable ( )
  - Sleep disturbance ( )
  - Being unhappy or depressed ( )
  - Feeling tired all the time ( )
  - Thinking "Life is not worth living ( )
  - Thinking "I'm worthless ( )
  - Thinking "I'm a failure ( )
  - Feeling frustrated ( )
  - Feeling overwhelmed ( )

8. What are some of typical behaviours and experiences of people with depression? Tick as many as apply.

- Be unable to concentrate or have difficulty thinking ( )

- Stop doing things they enjoy ( )
- Withdraw from close family and friends ( )
- Have relationship or family problem ( )
- Stop going out ( )
- Become dependent on alcohol, drugs or sedatives ( )
- Have suicidal thoughts or behaviours ( )
- Not get things done at school/work ( )
- Lack of selfcare (e.g. have a change in their personal hygiene habits) ( )

· Do you think that someone who has suffered depression can gain full recovery from the condition?

Yes ( ) No ( )

· Do you think antidepressants are useful in managing depression? Yes ( ) No ( )

Section C: Attitude Toward Depression

For each of the statements in the table below, indicate (tick) whether you 'strongly agree', 'agree', 'somewhat agree', 'somewhat disagree', 'disagree', and 'strongly disagree'

	Statement	Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strongly disagree
11	I just learn about depression when I have to, and would not bother reading additional material on it.						
12	People with a severe depression can never recover enough to have a good quality of life.						
13	Working in the depression clinic or field is just as respectable as other fields of health and social care						
14	If I had depression, I would never admit this to my friends because I would fear being treated differently.						
15	People with a severe mental illness are dangerous more often than not						
16	Health/social care staff know more about the lives of people treated for depression than do family members or friends.						
17	If I had depression, I would never admit this to my colleagues for fear of being treated differently.						
18	Being a health/social care professional working on depression is not like being a real health/social care professional						
19	If a senior colleague instructed me to treat people with depression in a disrespectful manner, I would not follow their instructions.						
20	I feel as comfortable talking to a person with depression as I do talking to a person with a physical illness.						

21	It is important that any health/social care professional supporting a person with depression also ensures that their physical health is assessed.						
22	The public does not need to be protected from people with severe depression						
23	If a person with depression complained of physical symptoms (such as chest pain) I would attribute it to their mental illness.						
24	General practitioners should not be expected to complete a thorough assessment for people with depression symptoms because they can be referred to a psychiatrist.						
25	I would use the terms 'crazy', 'mad' etc. to describe to colleagues people with depression who I have seen in my work						
26	If a colleague told me they had depression, I would still want to work with them.						

Section D: Perceptions About Depression

For each of the statements in the table below, indicate (tick) "True" or "False" depending on whether you agree or disagree with the statement

	Statement	True	False
27	People with depression often speak in a rambling and disjointed way		
28	People with depression may feel guilty when they are not at fault		
29	Reckless and foolhardy behaviour is a common sign of depression		
30	Loss of confidence and poor self-esteem may be a symptom of depression		
31	Not stepping on cracks in the footpath may be a sign of depression		
32	People with depression often hear voices that are not there		
33	Sleeping too much or too little may be a sign of depression		
34	Eating too much or losing interest in food may be a sign of depression		
35	Depression does not affect your memory and concentration		
36	Having several distinct personalities may be a sign of depression		
37	People may move more slowly or become agitated as a result of their depression		
38	Clinical psychologists can prescribe antidepressants		
39	Moderate depression disrupts a person's life as much as multiple sclerosis or deafness		
40	Most people with depression need to be hospitalised		
41	Many famous people have suffered from depression		
42	Many treatments for depression are more effective than antidepressants		
43	Counselling is as effective as cognitive behavioural therapy for depression		
44	Cognitive behavioural therapy is as effective as antidepressants for mild to moderate depression		
45	Of all the alternative and lifestyle treatments for depression, vitamins are likely to be the most helpful		
46	People with depression should stop taking antidepressants as soon as they feel better.		
47	Antidepressants are addictive		
48	Antidepressant medications usually work straight away		

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RESEARCH ETHICS COMMITTEE

(+256) 0312 307400
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23/10/2021

To: Kisaakye Rebecca

0702113059

Type: Initial Review

Re: CLARKE-2021-189: Knowledge, attitudes and perceptions about depression among students of Clarke International University, 2.0, 2021--20

I am pleased to inform you that at the **24th** convened meeting on **20/10/2021**, the Clarke International University REC, committee meeting, etc voted to approve the above referenced application.
Approval of the research is for the period of **23/10/2021** to **23/10/2022**.

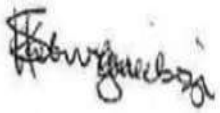
As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the REC for re-review and approval **prior** to the activation of the changes.
3. Reports of unanticipated problems involving risks to participants or any new information which could change the risk benefit: ratio must be submitted to the REC.
4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by participants and/or witnesses should be retained on file. The REC may conduct audits of all study records, and consent documentation may be part of such audits.
5. Continuing review application must be submitted to the REC **eight weeks** prior to the expiration date of **23/10/2022** in order to continue the study beyond the approved period. Failure to submit a continuing review application in a timely fashion may result in suspension or termination of the study.
6. The REC application number assigned to the research should be cited in any correspondence with the REC of record.
7. You are required to register the research protocol with the Uganda National Council for Science and Technology (UNCST) for final clearance to undertake the study in Uganda.

The following is the list of all documents approved in this application by Clarke International University REC:

No.	Document Title	Language	Version Number	Version Date
1	Protocol	English	2.0	2021--20
2	Risk Management Plan	English	1	2021-09-13
3	Informed Consent forms	English	1	2021-09-13
4	Data collection tools	English	1	2021-09-13

Yours Sincerely



Samuel Kabwigu
For: Clarke International University REC

APPENDIX IV: PERMISSION FOR THE STUDY

CIU CLARKE INTERNATIONAL UNIVERSITY LEAD · INNOVATE · TRANSFORM | SON School of Nursing and Midwifery

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Kampala, 26th August 2021

.....

.....

.....

.....

Dear Sir/Madam,

RE: ASSISTANCE FOR RESEARCH

Greetings from Clarke International University.

This is to introduce to you **Kisaakye Rebecca** Reg. No. **2017-BNS-FT-AUG-005** who is a student of our University. As part of the requirements for the award of a Bachelors degree in Nursing of our University, the student is required to carry out research in partial fulfillment of the award.

Her topic of research is: **Knowledge, Attitude and Perceptions about Depression among Clarke International University Students.**

This therefore is to kindly request you to render the student assistance as may be necessary for research. I, and indeed the entire University are grateful in advance for all assistance that will be accorded to our student.

Sincerely Yours,

Ms. Agwang Agnes

Dean, School of Nursing and Midwifery

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Kawagga Close, off Kalungi Road, Muyenga
Block 224 | Plot 8244 Bukasa Kyadondo
P.O.Box 7782 Kampala-Uganda

APPENDIX V: COVID-19 RISK MANAGEMENT PLAN

Introduction

The COVID-19 virus has been a serious health threat globally and has led to the death of many people. Therefore, there is need to take extra precaution when carrying out a research during this pandemic. The COVID-19 is a disease that is transmitted by people carrying the virus. The disease can be spread from person to person through aerosols expelled from the nose and mouth when a person coughs or sneezes. It can also be transmitted when humans have contact with hands or surfaces that contain the virus and touch their face, mouth or nose with the contaminated hands.

There is currently no specific treatment for COVID-19 and the vaccine which is there has only been given to few Ugandans leaving out the biggest portion out. Due to the rapidly increasing number of cases in the country, there is a great danger posed among communities to have cross infection from either symptomatic or asymptomatic individuals if COVID 19 safety guidelines are not well observed.

The researcher and the 2 research assistants who are to engage study participants using a printed questionnaire to collect data may be at high risk of infection which may potentially increase the risk of transmitting COVID-19 between study participants, their household members, participant to study staff and vice versa.

This Plan is designed to ensure the health and safety of research team and study participants against COVID-19. The following protocols will be observed to ensure the protection of study participants and my research team;

1. The research assistants and I will put on masks covering the mouth and the nose properly and consistently.

2. The research assistants and I will use an alcohol based sanitizers containing 80% alcohol several times.

3. My research assistants and I will maintain a 2- meter distance from our study participants during data collection.

4. Data collection will be done in an environment that is well aerated and few participants will be handled at a time to avoid overcrowding and the spread of COVID-19.

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The Significance of Hyponatremia Assessment before Surgical Intervention on the Confusion Table in the Borderline Subdural Hematom

Dr. Uğur Özdemir

ABSTRACT

The aim was to emphasize that changes in the consciousness table in a patient with traumatic borderline subdural hematoma may depend not only on hematoma but also on hyponatremia.

Our patient was a 60 year old, confused. The patient had borderline subdural hematoma and deep hyponatremia. The patient was followed up with clinical, radiological and laboratory findings. Consciousness was totally opened by the treatment of hyponatremia. In conclusion, if the patient has borderline subdural hematoma, we should not be rushed for surgery. In such patients, urgent electrolyte evaluations especially for hyponatremia should be done first, and this should be corrected.

Keywords: traumatic brain injury, borderline subdural hematoma, hyponatremia, inappropriate antidiuretic hormone secretion syndrome.

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Keywords: traumatic brain injury, borderline subdural hematoma, hyponatremia, inappropriate antidiuretic hormone secretion syndrome.

Author: Job address: T.C. Beykoz State Hospital, Neurosurgery Department (The Ministry of Health of Turkey)

I. INTRODUCTION

For neurosurgeons, subdural hematoma is often considered a condition that requires immediate surgery. However, hyponatremia, syndrome of inappropriate antidiuretic hormone secretion (SIADH) and cerebral salt-wasting syndrome (CSWS) are very important in clinical practice of neurosurgery. If this fine detail is not overlooked, patients are protected from unnecessary operations. Our patient had characteristics that could cause this confusion. We did not rush to the surgical option and corrected hyponatremia. Thus, the patient's clinic improved without surgical intervention. We wanted to present this case in order to express this attention.

II. CASE DESCRIPTION

Our case is a 60-year-old male patient. When the patient was brought to the hospital emergency department as a result of head trauma, the patient was in a confused state and was blinking with an audible stimulus. So the eye score of glasgow coma scale was two (GCSE=2). Verbal communication was confused level. So the verbal score of glasgow coma scale was four (GCSV=4). He was localizing the painful stimulus. So the motor score of glasgow coma scale was five (GCSM=5). So the total GCS score was 11. (Table)

Laboratory measurements

The first cranial computed tomography scan of the patient had subdural hematomas of about 1 cm at its widest point and cranial fractures. (Figure 1 and 2) Significant hyponatremia was the notable finding in the hospital laboratory examination of the emergency department (124 mmol/lt).

Clinical course

The patient was followed up clinically, laboratory and radiologically. While there was no radiologic difference in cranial computed tomography taken on the same day and other days, clinically significant improvement occurred with early treatment of the hyponatremic table. (Figure 3) Following the treatment of hyponatremia, the blood sodium level rose to 127 mmol/l on the first day, 128 mmol/l on the next day and 139 mmol/l in a few days. Despite the absence of radiological regression in the hematoma or effusion of the patient, the patient's consciousness was fully opened with the recovery of hyponatremia and the

patient began to establish normal verbal communication and began taking orders. So the GCS score was 15. The patient could be mobilized by opening the consciousness.

Comments

In traumatic brain injuries, effects due to electrolyte disturbances are as important as those due to direct neural tissue loss in patients' symptomatic charts. The most common of these charts are electrolyte imbalances due to "inappropriate antidiuretic hormone secretion syndrome" or "cerebral salt-wasting syndrome" tables[10]. And the most important electrolyte disorder is hyponatremia. For hyponatremia that occurs in these conditions, "inappropriate antidiuretic hormone secretion syndrome" is of higher priority than "cerebral salt-wasting syndrome"[9]. In the body water and sodium imbalance, damage to the brain tissue is important. Therefore, the improvement of brain tissue damage is important in the recovery of this imbalance[2]. The presence of hyponatraemia and the level of brain edema in brain computerized tomography are closely related. In this respect, computerized tomography is more important than the Glasgow Coma Scale[5]. Acute hyponatremia, especially in traumatic situations, is more likely to cause acute brain edema than chronic hyponatremia. In addition, the patient's clinic is more disrupted in acute hyponatremia than in chronic hyponatremia. As brain edema increases, hyponatremia deepens[4]. In traumatic brain injuries, hypokalaemia is also a common finding as an electrolyte imbalance. But it's not as important as hyponatremia[1]. Serum sodium levels are more correlated with diffuse brain lesions than focal brain lesions[7]. Hyponatremia is also the primary clinical table in diffuse clinical tables such as viral brain infections[8]. In patients with traumatic brain injury, hyponatremia is more likely to develop if GCS is below 8, if cerebral edema is predisposed and if skull base fracture is present[6]. The purpose of presenting this phenomenon is not to open the cause of hyponatremia in traumatic brain-damaged patients. It is important to know that changes in consciousness patterns in a patient with posttraumatic borderline subdural hematoma may be due not only to hematoma but also to hyponatremia. In other words, it is important to emphasize that such patients should not be rushed for surgery without emergency electrolyte assessments. Literature surveys have shown that sometimes emergency surgical procedures can worsen hyponatremia and clinical deterioration[3].

Funding: No funding was received for this research.

Conflict of Interest: Author declares that he has no conflict of interest.

Ethical approval: This article does not contain any studies with human participants or animals performed by the author.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

REFERENCES

1. Badikillaya VU, Tummi M, Pernenkil S (2013) Hyponatraemia in Head Injuries Caused by Road Traffic Accidents. Journal of Clinical and Diagnostic Research 2:407-408.
2. Bradshaw K, Smith M (2008) Disorders of sodium balance after brain injury. Continuing Education in Anaesthesia, Critical Care & Pain 4: 129-133.
3. Chang C-H, Liao J-J, Chuang C-H, Lee C-T (2008) Recurrent Hyponatremia After Traumatic Brain Injury. The American Journal Of The Medical Sciences 5:390-393.
4. Hannon M J, Thompson C J (2014) Neurosurgical Hyponatremia. Journal of Clinical Medicine 3:1084-1104.
5. Lohani S, Devkota UP (2011) Hyponatremia in patients with traumatic brain injury: etiology, incidence, and severity correlation. World Neurosurgery 76(3-4):355-360.
6. Meng X, Shi B (2016) Traumatic Brain Injury Patients With a Glasgow Coma Scale Score of ≤8, Cerebral Edema, and/or a Basal Skull Fracture are More Susceptible to Developing

Hyponatremia. J Neurosurg Anesthesiol 28 (1):21-26.
7. Paiva WS, Bezerra DAF, Amorim RLO, Figueiredo EG, Tavares WM, Andrade AF, Teixeira MJ (2011) Serum sodium disorders in patients with traumatic brain injury. Therapeutics and Clinical Risk Management 7:345–349.
8. Reimann D, Gross P (1996) Sudden onset of unconsciousness and hyponatraemia. Facts and myths about salt and water in SIAD. Nephrol Dial Transplant 11:2101-2102.
9. Sepehri P, Abbasi Z, Mohammadi N S, Bagheri S, Fattahiana R (2012) Hyponatremia in traumatic brain injury patients: Syndrome of Inappropriate Antidiuretic Hormone (SIADH) versus Cerebral Salt Wasting Syndrome(CSWS). Journal of Injury and Violence Research. 1:17.
10. Yumoto T, Sato K, Ugawa T, Ichiba S, Ujike Y (2015) Prevalence, Risk Factors, and Short-term Consequences of Traumatic Brain Injury-associated Hyponatremia. Acta Medica Okayama 4:213-218

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Level of Awareness on Covid-19 Vaccine Administration among Health Care Professionals as Determinants to Safe Vaccine Administration in the Integrated Provincial Health Office and City Health Office Marawi City, Philippines

Mohammad Ryan Iamla

INTRODUCTION

Background of the Study: Vaccines have played an important role in the lives of the people, most especially the children. It has helped prevent and protect the spread of contagious, dangerous and deadly diseases.

Getting vaccinated produces antibodies that will fight that antigens in someone's body. Thus, it keeps an individual from getting and spreading the disease. In other words, a vaccine is a safer substitute for an individual's first exposure to a disease. The individual gets protection without having to get sick. Through vaccination, people can develop immunity without suffering from the actual diseases that vaccines prevent.

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Level of Awareness on Covid-19 Vaccine Administration among Health Care Professionals as Determinants to Safe Vaccine Administration in the Integrated Provincial Health Office and City Health Office Marawi City, Philippines

Mohammad Ryan Iamla

I. INTRODUCTION

Background of the Study

Vaccines have played an important role in the lives of the people, most especially the children. It has helped prevent and protect the spread of contagious, dangerous and deadly diseases.

Getting vaccinated produces antibodies that will fight that antigens in someone's body. Thus, it keeps an individual from getting and spreading the disease. In other words, a vaccine is a safer substitute for an individual's first exposure to a disease. The individual gets protection without having to get sick. Through vaccination, people can develop immunity without suffering from the actual diseases that vaccines prevent.

Vaccination has contributed significantly to global health. Since the establishment of WHO's Expanded Programme of Immunization in 1974 and the Global Alliance for Vaccination and Immunization in 2000, global coverage of vaccination against many important infectious diseases of childhood has increased dramatically.

Vaccines are biological agents that elicit an immune response to a specific antigen derived from an infectious disease-causing pathogen (Czochor & Turchick, 2014). The term "vaccine" comes from the Latin Variolae vaccinae (cowpox), which Edward Jenner demonstrated could prevent smallpox in humans in 1798. Today, the term "vaccine" refers to all biological preparations derived from living organisms that boost immunity to disease and either prevent (prophylactic vaccines) or, in some cases, treat disease (therapeutic vaccines) (Greenwood, 2014).

Vaccines are given in liquid form via injection, oral administration, or intranasal administration. Vaccines are made up of the entire pathogenic microorganism or some of its components (World Health Organization, n.d.).

COVID-19 is a deadly virus that continues to afflict many countries around the world. The Americas and Europe have a higher incidence than South East Asia, Africa, and the Western Pacific (World Health Organization, 2020).

Vaccines are the most important public health measure for protecting people from COVID-19 around the world, because SARS-CoV-2 is highly contagious and infects populations all over the world (Amanar & Krammer, 2020). Vaccine development has traditionally taken years, if not decades: from about 40 years for polio to 5 years for Ebola, most vaccines took 15 years on average (Deb et al., 2020). The vaccine trial process consists of several steps that must be completed in a systematic and measurable manner. The length of this process is related to the nature of the vaccine, which is to protect healthy people from pathogen infection. Adverse events and negative effects will not be tolerated; vaccines are not the same as drugs that patients take. Prescription drugs and vaccine administration have different risk–benefit analyses.

This study determines the level of awareness of nurse's vaccinator in administering a safe COVID-19 vaccine. The COVID-19 vaccines

provide disease protection by eliciting an immune response to the SARS-Cov-2 virus. Developing immunity through vaccination reduces the likelihood of developing the illness and its consequences. Furthermore, the goal of this study is to raise awareness among healthcare workers about the importance of proper and efficient administration, including the safekeeping of COVID-19 vaccines prior to giving them to patients in the community. Nurses must provide the best possible care to their patients while exercising extreme caution at all stages of the nurse-patient interaction. It is critical that nurses are kept up to date on innovations in the healthcare setting, and thus this study was designed to place a greater emphasis on the fundamental connotation in all aspects of patient care, which is client's safety.

II. THEORETICAL FRAMEWORK

This study was anchored on the point of view of theories of well-known authors which are closely relevant to the research study. These theories are the Health Belief Model and the Theory of Planned Behavior.

Health Belief Model. The Health Belief Model (HBM) tries to describe two forms of health beliefs that make a behavior in response to disease more or less appealing (Sheeran and Abraham 1996): perceptions of illness threat and evaluations of the effectiveness of acts to combat this threat. The perceived vulnerability to the sickness and the severity of the illness's consequences influence threat perceptions. These characteristics, when added together, affect the likelihood that an individual would take a health-related activity, albeit their impact is influenced by demographic factors, social pressure, and personality. The appraisal of the possible choices determines the specific action taken. This behavioral evaluation is based on perceptions about the health practice's advantages or efficacy, as well as the perceived costs or barriers to practicing the action (Connor, 2001).

As a result, individuals are more likely to engage in a specific health behavior if they believe they are susceptible to a specific condition or illness that they consider to be serious, and they believe the benefits of the behavior undertaken to counteract the condition or illness outweigh the costs. This entire process is thought to be set in motion by cues to action. Cues to action include a wide range of triggers to the individual acting and are commonly classified as internal (e.g., physical symptoms) or external (e.g., mass media campaigns, advice from others) to the individual.

Other influences on health behavior performance, such as demographic factors or psychological characteristics (e.g. personality, peer pressure, perceived control over behavior), are thought to exert their influence through changes in the HBM components (Connor, 2001).

The Health Belief Model (HBM) is a theoretical framework that has been frequently utilized to predict whether people would engage in illness prevention or risk reduction (Kibler et al., 2018).

Perception variables, such as beliefs about personal susceptibility to disease, the seriousness of the disease, the benefits of acting, and barriers to behavioral change, influence motivations to initiate and maintain health-protective behaviors, according to this model. The greater the perceived risk, the more likely it is that people will change their behavior to reduce risk (Kibler et al., 2018).

In general, the Health Belief Model states that if an individual accepts the necessary change, it is important for them to see the benefit of making the change. Thus, the benefits of vaccines to an individual should always be presented. The key elements of the Health Belief Model focus on individual beliefs about health conditions, which predict individual health-related behaviors. It defines the key factors that influence health behaviors as an individual's perceived threat to sickness or disease, belief of consequence, potential positive benefits of action, perceived barriers to action, exposure to factors that prompt action, and confidence in ability to succeed. Therefore, these factors helps influence and individual's decision on getting vaccinated or not.

Theory of Planned Behavior. The development of behavioral theories has greatly aided our understanding of community health behavior by

allowing for systematic approaches to behavioral research (US Department of Health and Human Services, 2005). The Theory of Planned Behavior (TPB) is one such theory that has been used to identify factors associated with the intention to perform a behavior, such as being immunizable. A health behavior, according to this theory, can be predicted based on the individual's intention to perform the behavior (Azjen, 1991). The model's outcome is predicted by three major constructs, behavioral intention. These three constructs are: attitude, subjective norms, and perceived behavioral control.

According to the Theory of Planned Behavior, whether or not a person will comply with a specific behavior, in this case taking the COVID-19 vaccine, is determined by three major factors (Azjen, 1985). These factors include the individual's attitudes toward vaccination in general, and the COVID-19 vaccine in particular; the attitudes of the significant others toward the vaccine; and the perceived behavioral control, which refers to the perceived difficulty in performing the behavior, namely, taking the vaccine.

All three of these factors are influenced by people's social perceptions of vaccines. Social media creates and modifies these representations. Social media influence attitudes and behavior significantly. Furthermore, it is well known that attitudes are not directly related to behavior.

Individuals may have a positive attitude toward something, but they will not always act in a way that is consistent with that attitude (Lapiere, 2010).

III. CONCEPTUAL FRAMEWORK

The focus of this study was determining the patients' safety on COVID-19 vaccination provided in the City Health Office and Integrated Provincial Health Office of Lanao del Sur. The following diagram discusses on the flow of the research gathering. It shows the independent variables such as the professional profile of the respondents in terms of sex, highest educational attainment, trainings and seminars on vaccination, and number of years in service.

Further, it shows the dependent variables are the respondent's awareness on patient's safety pertaining to safe COVID-19 vaccine administration in terms of vaccines, potency, temperature, storage, sustainability of electric power, distance travelled during delivery of the vaccine, dosage, preparations, and route. It also shows the hypothesis testing on the relationship between the respondent's professional profile and their awareness on safe COVID-19 vaccine administration.

IV. ANALYTICAL MODEL

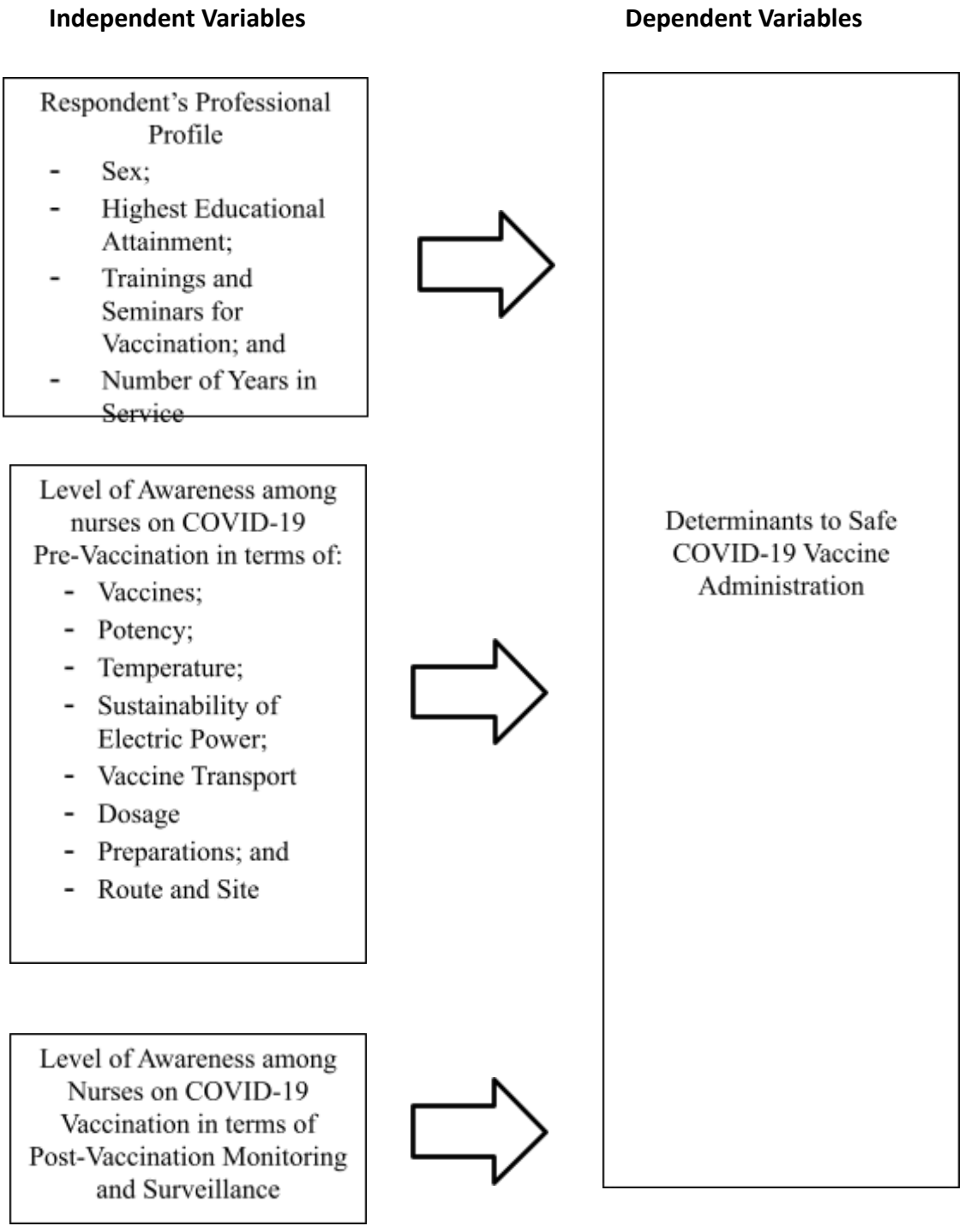

Figure 1: Schematic Diagram of the Study

V. STATEMENT OF THE PROBLEM

The study aimed to determine the level of awareness of the nurses' vaccinators in administering a safe COVID-19 vaccine in the Integrated Provincial Health Office and the City Health Office.

Specifically, it seeks to answer the following questions:

1. What is the professional profile of the respondents in terms of their:

a) Sex;
b) Highest Educational Attainment;
c) Trainings and Seminars on Vaccination; and
d) Number of Years in Service?

2. What is the respondent's awareness on COVID-19 Pre-Vaccination in terms of:

a) Vaccines;
b) Potency;
c) Temperature;
d) Storage;
e) Sustainability of Electric Power;
f) Vaccine Transport;
g) Dosage;
h) Preparations; and
i) Route and Site?

3. What is the respondent's awareness on COVID-19 Vaccination in terms of Post-Vaccination Monitoring and Surveillance?
4. Is there a significant relationship between the respondent's professional profile and the determinants to safe COVID-19 vaccine administration?
5. Is there a significant relationship between the level of awareness among nurses on COVID-19 pre-vaccination and the determinants to safe COVID-19 vaccine administration?
6. Is there a significant relationship between the level of awareness among nurses on COVID-19 vaccination in terms post-vaccination monitoring and surveillance, and the determinants to safe COVID-19 vaccine administration?

VI. NULL HYPOTHESIS

Ho1: There is no significant relationship between the respondent's professional profile and the determinants to safe COVID-19 vaccine administration.

Ho2: There is no significant relationship between the level of awareness among nurses on COVID-19 pre-vaccination and the determinants to safe COVID-19 vaccine administration.

Ho3: There is no significant relationship between the level of awareness among nurses on COVID-19 vaccination in terms post-vaccination monitoring and surveillance, and the determinants to safe COVID-19 vaccine administration.

VII. SCOPE AND DELIMITATION

Fears about the safety and efficacy of the COVID-19 vaccine will lead to a significant number of people refusing to be vaccinated. The purpose of this study was to assess community health nurses' knowledge of the safe administration of the COVID-19 vaccine. The study established an inclusion criterion that respondents must be assigned nurse vaccinators from the Integrated Provincial Health Office and the City Health Office in Marawi City. Furthermore, the study's findings will provide insight into the level of awareness of COVID-19 vaccine handling and storage, as well as associated practices. However, there was no follow-up to see if the respondents' level of awareness had changed.

VIII. SIGNIFICANCE OF THE STUDY

This study is significant on providing information about patient's safety in being vaccinated in the Integrated Provincial Health Office and the City Health Office in Marawi City. Findings of this study will be significant to the following:

Community: The result of this study will be a good help in making the community understand of the importance and safeness of getting vaccinated. Moreover, it will help encourage the community to get vaccinated to protect their family from the COVID-19 and prevent its spread to others.

Patients: The study's findings will help patients understand the significance of COVID-19 vaccination in ensuring their safety. Furthermore, being informed of the vaccinators' expertise of

safe COVID-19 vaccine administration may help reduce the number of patients refusing to be vaccinated.

Department of Health: The study's findings will be useful to the Department of Health in identifying potential issues that nurses and patients may face when administering the COVID-19 vaccine. It would also assist the department in providing quality services to ensure the safety of the patients.

Integrated Provincial Health Office and City Health of Office: The findings of this study will aid in the implementation of proper practices for administering COVID-19 vaccines in the said offices. It will also aid programs that may be required to improve community health workers' knowledge and awareness of the COVID-19 vaccination.

Healthcare Professionals: The findings of this study will be useful in assessing healthcare professionals' expertise of safe COVID-19 vaccine administration. Furthermore, it will assist in correcting and improving their skills in order to avoid mistakes when administering vaccinations in their area of assignment.

SMDFA: The result of this study will be useful to the institution as it will help them integrate this to the curriculum of the programs they offer.

Faculty: The result of this study will be useful to the faculty members as it will help them inform and teach the students of the safe vaccine administration.

Future Researchers: This study could be used as a reference for future researchers who are conducting a similar or related study.

VII. DEFINITION OF TERMS

For the convenience of readers, the following terms are conceptually and operationally defined.

Cold Chain Incident: This refers to the occurrence when vaccine is exposed to a temperature outside the required temperature range for any period of time and the potency of the vaccine is potentially compromised (Niagara Region, 2021). In this study, it refers to the exposure of the vaccine outside its required temperature that may compromise its potency.

Community Health Nurse: This refers as the synthesis of nursing and public health practice applied to promote and protect the health of the community. It combines all the basic elements of professional, clinical nursing with public health and community practice (Meadows, 2009). In this study, refers to an individual with a nursing profession to carry out preventive patient care in communities by administering vaccinations.

Dosage: This refers to the size or frequency of a dose of a medicine or drug (Oxford Languages, 2021). In this study, it refers to the volume of vaccine being administered to a patient.

Electric Power: This refers to is characterized by current or the flow of electric charge and voltage or the potential of charge to deliver energy (Britannica, 2021). In this study, it refers to the rate, per unit time, at which electrical energy is transferred by an electric circuit.

Expired Vaccine: This refers to a situation when if the month and year are specified, the vaccine expires at the end of the month (Health Desk, 2021). In this study, it refers to the vaccines that has expired and will not be used anymore.

Exposed Vaccine: This refers to vaccines that is stored or handled at temperature below the required temperature range at any period of time, or that is not stored according to the manufacturer's recommendations (Health Desk, 2021). In this study, it refers to the vaccine that the potency has been compromised.

Health Care Provider: This refers to a regulated health care professional who manages publicly funded vaccines and provides immunization services (Health Desk, 2021). In this study, it refers to the health professionals that provides healthcare diagnosis to the people.

Highest Educational Attainment: This refers to a qualification awarded on successful completion of a course or study in higher education (Oxford Languages, 2021). In this study, it refers to the highest level of education taken up by the community health nurses.

Potency: This refers to the ability of the vaccine to produce a predictable and expected level of immune response in the vaccine recipient (Oxford Languages, 2021). In this study, it refers to the strength of the vaccine, as measured by the amount needed to produce a certain response.

Route: This refers to the route of administration which a vaccine is brought into contact with the body (Britannica, 2021). In this study, it refers to the passage of the vaccine as it gets inside the vaccinated individual's body.

Seminars: This refers to a form of academic instruction, either at an academic institution or offered by a commercial or professional organization (Britannica, 2021). In this study, it refers a conference or other meetings or trainings attended by the nurses in improving their skills.

Sex: This refers to either the two main categories, male and female, which humans and other living things are divided on the basis of their reproductive functions (Oxford Languages, 2021). In this study, it refers to the gender of the nurses, either male or female.

Skin Preparation: This refers to the removal of as many bacteria as possible from the patient's skin through shaving, mechanical washing and chemical disinfection (Medical Dictionary, 2021). In this study, it refers to the disinfection of the area in the body of the individual where the vaccine will be injected.

*Storage: T*his refers to the forms of storage in which vaccines are stored routinely in a refrigerator (Health Desk, 2021). In this study, it refers to the area where the vaccines will be stored.

Temperature: This refers to the degree or intensity of heat present in a substance or object (Health Desk, 2021). In this study, it refers to the degree of coldness that should be needed by the vaccine to maintain its effectiveness.

Vaccines: This refers to a substance used to stimulate the production of antibodies and provide immunity against one or several diseases, prepared from the causative agent of a disease, its products, or a synthetic substitute, treated to act as an antigen without inducing the disease (Health Desk, 2021). In this study, it refers to the drug that will help prevent the spread of the COVID-19 virus.

VIII. EVIEW OF RELATED LITERATURE AND RELATED STUDIES

This chapter were composed of discussion of facts and principles to which the present study is related. It deals with literature reviewed or surveyed and which serve as references and background for the subject at hand.

IX. RELATED LITERATURE

Vaccines

It is often stated that vaccination has made the greatest contribution to global health of any human intervention apart from the introduction of clean water and sanitation. Study of the pattern of infectious diseases in industrialized countries from the end of the nineteenth century onwards shows that there was a large and progressive decline in child mortality, owing largely to a reduction in mortality from infectious diseases, prior to the development and deployment of vaccines. This was associated with improvements in housing, nutrition and sanitation. Nevertheless, it is indisputable that vaccination has made an enormous contribution to human and animal health, especially in the developing world.

Mortality from smallpox and measles was massive in the pre-vaccination period with up to a half of the population dying from the former during epidemics and measles was only a little less lethal in susceptible populations (Greenwood, 2014).

The outbreak of SARS-CoV-2 among humans made it the third zoonotic coronavirus to move from animals to humans after SARS-CoV (Drosten et al., 2003) and MERS-CoV (Zaki et al., 2012). After establishing that the virus causing the acute respiratory disease was zoonotic (Rothan & Byrareddy, 2020), further epidemiology and pathology studies have been going on to understand the virus structure and possible development of vaccines to counter the infection and spread. Viral genome sequencing showed that this virus has 75 to 80% similarity to SARS-CoV,

50% to MERS-CoV and more similarity can be observed in other coronaviruses like those of bats (Zhu et al., 2020). Further, it can be cultured in conditions similar to those of Middle East respiratory syndrome coronavirus (MERS-CoV) and SARS-CoV. Due to this similarity i.e., causing acute respiratory distress (ARD) and its structure (FDA, 2020), this virus was named SARS CoV-2, and the disease it causes is called COVID -19, where 19 is associated with the year (2019) when this disease was first reported. Moreover, the binding affinity of SARS-CoV-2 and SARS-CoV spikes (S) is the same as they use the Angiotensin-converting enzyme 2 (ACE2) receptor to infect a cell (Walls et al., 2020).

With such an understanding of SARS-CoV-2's binding mechanism and its glycoproteins, researchers have developed vaccines that are at different stages of clinical trials and approved for use at a wider scope. For any vaccine to get general approval, it has to show promising results during the stages of its clinical trials. The trials always work towards establishing short-term safety, efficacy and the ability to generate enough immune response. According to the CDC, vaccine efficacy is defined as the differences between people who become sick following vaccination and those who become sick without receiving the vaccination. It is a measure identified during the third phase of a clinical trial in which the researcher vaccinates some people and give a placebo to others. The test subjects are then monitored for some months to witness whether or not the people who get vaccinated get infected at a lower rate compared to those who received placebo. For instance, suppose a COVID-19 vaccine is said to be having a vaccine efficacy of 80%, then it means that if one hundred people had been vaccinated, then on average, 80 people out of the 100 will not acquire COVID-19. On the same note, vaccine safety is defined as its ability not to cause any health complication, either at the present or in future, on the people who have been vaccinated.

X. COVID-19 VACCINES

Researchers have developed vaccines that are at different stages of clinical trials and approved for use at a wider scope. Below is a brief outline of these vaccines.

Pfizer

From the trial involving a sample size of 21720 (Polack et al., 2020), the vaccine candidates, ≥16 years received 30µg of this mRNA vaccine administered in 2 doses 21 days apart. Among the 21720 candidates who received the vaccine, 8 of them exhibited COVID-19 signs at least one week after the second dose of the vaccine. BNT162b2 showed a protection percentage of 95% (95% CI, 90.3 -97.6) with safety issues indicated by temporary pain at the point of injection, fatigue, and headache which were rated as normal local reactions. Less than 1% experienced severe pain at the injection spot. The vaccine is considered safe for the prevention of COVID-19 infection and the antibodies last for 2 months. The vaccine was approved by U.S. Food and Drug Administration (FDA). The reported side effects were mainly tiredness and headache (59% and 52%, respectively (Polack et al., 2020).

Moderna

Clinical trials done by researchers and involving a sample size of 30,000 (Baden et al., 2021) reveal that the mRNA-1273 vaccine was administered in 100 µg doses 28 days apart. Just like, BNT162b2, this lipid nanoparticle encapsulated vaccine was tested in the placebo and the mRNA vaccine at a ratio of 1:1. COVID-19 symptoms were observed in 11 patients out of the 15,210 individuals who received the mRNA-1273 vaccine. The efficacy was found to be 94.1% i.e. (95% CI, 89.5 – 96.8%; $p<0.001$). According to the researchers, there are no safety issues with the vaccines since it is only the expected local and systemic reactions that were observed. The antibody last for 4 months upon vaccination. The vaccine was approved by U.S. Food and Drug Administration (FDA) (Baden et al., 2021). The reported side effects comprised of painat the point of injection (91.6%), fatigue (68.5%), headache (63.0%), muscle pain (59.6%), and joint pain (44.8%) (Callaway, 2020).

AstraZeneca

This vaccine was tried in South Africa, United Kingdom, and recently in Brazil with participants receiving 5× 〖10〗 ^10 molecules of the vaccine

based on research done by (Voysey, 2020). The Clinical trial phase 3 involved a sample size of 23 848 participants (Voysey, 2020). The overall vaccine efficacy was computed as 70.4% (95% CI, 54.8-80.6, 30[0.5%] of 5807 patients). This viral vector vaccine was shown to be efficacious and safe for combating COVID-19 since only 79 patients out of 5807 who received ChAdOx1 vaccine showed COVID-19 symptoms. The antibody last for 6 months upon vaccination. The vaccine was approved by Institutional Biosafety Committee (IBC) (Voysey, 2020). The major side effects included fatigue and headache (Knoll & Wonodi, 2021).

Sinovac

China's CoronaVac COVID-19 vaccine that was developed by Sinovac has been proven to be harmless and protective after its third phase trials in various countries across the world, a factor that has boosted the public confidence regarding its rollout in different parts of the world (Cohen, n.d.). According to scholarly results, Sinovac's vaccine is 100 per cent efficient and effective in preventing moderate infections, 77.9% effective in preventing possible mild cases, and poses an overall efficacy of at least 50.4 per cent in Brazil latest final trials (Palacios et al., 2020). Vaccine experts have indicated that the trial results are good enough for the vaccine to be enrolled for use among the general population. It is estimated that the antibody last for 6 months upon vaccination.

The vaccine was approved by Chinese government following phase 3 clinical trials done in Brazil and other countries that involved 50,000 participants (Palacios et al., 2020). Allergies were reported as a major side effect among the participants.

Dangers of Vaccines and Vaccination

The prospects for control of diseases by vaccination are thus quite bright, but it must be admitted that several problems loom large and darken the picture. First, vaccine supply is insufficient. Even in industrialized countries, shortages of vaccines occur because there are too few manufacturers, and regulatory pressures render production ever more difficult. In the event of an emergency, such as an influenza pandemic, it is difficult to see how demand could be satisfied or access provided to developing countries. The growth of new manufacturers in developing countries like India, China, Indonesia and Brazil may fill this gap, but the solution to supply shortage is not yet clear.

Cost of vaccines is also now a problem, because new vaccines require $300 to $800 million to develop and those companies that do research and development must recoup the costs. If vaccines are to be applied broadly throughout the world, several circumstances must be maintained: higher price in developed countries, recognition by governments that the financial savings because of vaccination justify expenditures to buy vaccines, and support by donor agencies of vaccine purchases for poor countries. When the vaccine target is one that concerns only developing countries, the problem becomes even more difficult. The support of the Bill and Melinda Gates Foundation for the development of vaccines against those targets has been crucial, but at a certain point industrial manufacture will be necessary. This will require vaccine production facilities outside of developed countries or subsidized facilities at major manufacturers.

There is a growing demand for vaccine safety, fueled in part by antivaccination groups. As disease recedes, the need for vaccination becomes less evident to the public, and more people opt out of the social contract to be vaccinated, depending instead on the herd immunity of surrounding vaccinated persons. Of course, herd immunity will fail if too many refuse to be vaccinated. But there are real safety problems associated with vaccines, such as paralysis after oral polio vaccine (WHO, 1960) and disseminated infections after Bacille Calmette-Guérin (Hoft et al., 1999). For that reason, older vaccines need to be reexamined to see whether safety can be improved, as was done through replacement of whole-cell pertussis vaccine by acellular pertussis vaccines and replacement of rabies vaccine made in brain by vaccine made in cell culture. In the near future, Jenner's vaccinia will be replaced by further attenuated vaccinia (McCurdy et al., 2004) and Bacille Calmette-Guérin by engineered vaccines for tuberculosis (Horwitz & Harth, 2003). Indeed,

one of the advantages of the newer molecular technologies is improved safety. As risk-benefit ratios become more controversial when disease presence declines, it will be important to reduce vaccine-associated reactions to a minimum. On the other hand, zero risk is impossible to attain, and there will always be tension between the needs of public health and the regulatory impulse to guard against even remote and theoretical risks. The latter tendency acts as a brake on the rapid application of new public health measures. Thus, there is disagreement as to whether to err on the side of safety or of disease prevention.

As vaccines are key tools for maintenance of public health, governments have a major role in their dissemination through recommendations and purchase. Although governmental agencies (particularly the US National Institutes of Health) importantly support the basic research that provides candidate vaccines, their direct involvement in industrial development and production has decreased. It is doubtless more efficient for industry to take vaccines from concept to license, but governments should advise about the choice of targets for vaccine development and guarantee markets for products developed at their request. Moreover, it has become obvious that governments must be proactive in preventing vaccine shortages by inducements for multiple suppliers.

There are many diseases as yet uncontrolled by vaccination, and new diseases are sure to emerge through evolution by mutation and gene exchange, interspecies transfer or human exposure to new environment (Morse, 1994).

Fortunately, we have many new tools with which to produce protective antigens. Two hundred years of research have enabled us to turn the immune system to our advantage, and increased understanding of microbial pathogenesis and host responses should allow us to extend control of disease by vaccination.

Rationale of the COVID-19 Vaccination Program

The long-term solution to the coronavirus disease 2019 (COVID-19) pandemic, hopefully, will be a globally implemented, safe vaccination program that has broad clinical and socioeconomic benefits. Dozens of vaccines are in development, with 8 currently in phase 1 trials. Some scenarios predict the earliest, widespread availability of a COVID-19 vaccine to be in 2021 (Rowland et al., 2020). As launches of prior mass vaccination programs have demonstrated, careful planning to ensure readiness of both the general public and the health community for a COVID-19 vaccine should begin now.

To substantially reduce morbidity and mortality from COVID-19, an efficacious and safe vaccine must be delivered swiftly and broadly to the public as soon as it is available. However, the mere availability of a vaccine is insufficient to guarantee broad immunological protection; the vaccine must also be acceptable to both the health community and general public. Vaccine hesitancy is a major barrier to vaccine uptake and the achievement of herd immunity, which is required to protect the most vulnerable populations.

Depending on varying biological, environmental, and sociobehavioral factors, the threshold for COVID-19 herd immunity may be between 55% and 82% of the population (Sanche et al., 2020).

Given that certain individuals will be ineligible for COVID-19 vaccination due to age, immuno-compromise, and other preexisting medical conditions, a vaccine refusal rate greater than 10% could significantly impede attainment of this goal.

Recent surveys, that included 493 and 2200 individuals, suggest only 3 in 4 people would get vaccinated if a COVID-19 vaccine were available, and only 30% would want to receive the vaccine soon after it becomes available (Trujillo & Motta, 2020). Confidence in vaccines lies along a spectrum, and individuals who have hesitation about routine childhood vaccines have expressed various concerns (Edwards & Hackell, 2016). In their report on vaccine hesitancy, Edwards and Hackell (2016) identified 3 broad categories of parents' concerns regarding childhood vaccines: (1) the necessity of vaccines, (2) vaccine safety, and (3) freedom of choice.

Rationale for the Philippine Deployment and Vaccination Plan

The Philippine National Deployment and Vaccination Plan for COVID-19 Vaccines was drafted for the purpose of providing operational guidance in the implementation of the COVID-19 vaccine deployment and vaccination program.

The drafting of the plan involved the participation of various government agencies to ensure alignment of policies and plans among agencies and integration of the said plans into national governance mechanisms. In addition, the deployment of COVID-19 vaccines and the implementation of the COVID-19 vaccine program necessitates the participation of all members of the society. Thus, a whole of society approach is being implemented where all members of the society and government are encouraged to participate and take action to achieve collective goals and objectives. In this regard, while the government leads in the deployment of vaccines and implementation of a vaccination program, the private sector and other organizations are engaged to collaborate and work closely with the government to ensure a unified and coordinated vaccination campaign is conducted.

Cold Chain Management

COVID-19 vaccines require refrigeration with temperature ranges of +2°C to +8°C, -15°C to -24°C and to as low as -70°C to -80°C; cold chain management, whereby adequate refrigeration levels are maintained from manufacturing, storage and distribution of vaccines, and ensures integrity of vaccine compounds via specialized packaging as well as refrigeration and freezer devices. However, ensuring effective cold chain management for COVID-19 vaccines shall entail particular requirements and constraints around temperature maintenance for transport and storage and administration of the vaccines. With this, supply chain readiness at all the management levels shall be in place to efficiently deploy COVID-19 vaccines to the target population.

Storage and Distribution of COVID-19 Vaccines

Given the Philippine's geographic size and population, storage of the vaccines will be centralized and managed preferably by a single logistics provider, with substantial relevant experience. As the different types of vaccine require varying temperature storage requirements, (1) ultra-cold (- 70°C to -80°C), (2) frozen (-15°C to -25°C), and (3) refrigerated (2°C to 8°C), the identified logistics partner/s have to ensure substantial capacity for each temperature range.

To ensure the correct volume of vaccines are received by each Vaccination Administration Location (VAL) at the right time, a robust, accurate, real-time inventory management system will be in place to assure availability and maintenance of adequate supplies, minimize potential wastage and accurately forecast demand which can be met. The varying storage temperatures and shelf-lives out of storage of each vaccine type will mean certain vaccine types may be more suited to certain vaccination location types, depending on the volume of vaccinations carried out at the setting and the storage facilities on site. The distribution plan has accounted for this assigning the different vaccines for different locations. Ensuring adequate availability of the vaccine for the second dose will also be considered when managing stock levels. To cater for the three (3) main temperature categories, namely: (1) +2°C to +8°C, (2) -20°C and (3) -70°C to -80°C, a scenario based planning has been developed. The first two temperature ranges can be handled in the current health structures because vaccines in the National Immunization Program (NIP) has the same temperature requirement. However, the vaccines requiring -70°C to -80°C are new and shall need a special storage package and a complicated distribution mechanism. Thus, the following scenarios has been considered in the vaccine distribution:

Scenario 1 & 2: Distribution shall follow the pathway for the routine vaccines from the national cold storage facilities up the service delivery points, the health centers and hospitals allow the cold chain storage and distribution in NIP pathway of the current vaccines in the National Immunization Program of the DOH.

These vaccines require +2°C to +8°C cold storage facilities. Such facilities are in place such as the Research Institute for Tropical Medicine (RITM) as the centralized vaccine hub, regional warehouses and the RHUs and hospitals.

Scenario 3 requires a cold storage facility of -70°C to -80°C. Currently, none of the government hospitals are capable of such, thus the government will have to procure or outsource/ hire a private facility.

These scenarios may also vary based on the services that will be provided by the vaccine manufacturer such as but not limited to direct distribution to the service delivery sites, presence of a distributor in the country.

Within the Philippines, existing infrastructure and established vaccination distribution channels will mean vaccines can be delivered efficiently using air and road distribution channels directly from the central storage facility to the designated cluster hub warehouses. The logistics partner/s will also manage the delivery fleet and outbound logistics / delivery to the principal vaccination locations. All deliveries will be by chilled (+2°C to +8°C) distribution using the selected logistics partner's fleet. The fleet will operate to a very high specification with full GPS monitoring, remote temperature monitoring and redundancy on the cooling systems on the vehicle. The vaccine handling characteristics for other vaccines will be more clearly defined by manufacturers as the regulatory approvals process emerges.

Vaccine Safety Monitoring, and Management of Adverse Events Following Immunization

The role of vaccine safety monitoring during COVID-19 vaccine introduction is to facilitate the early detection, reporting, notification, investigation and analysis, and feedback of Adverse Events Following Immunization (AEFIs) and Adverse Events of Special Interest (AESI), to ensure appropriate and timely case management and response. These activities shall assist vaccines and ensure them of prompt and timely response should an AEFI occur. The AEFI surveillance entails:

- Timely detection of serious AEFIs/AESIs to provide up-to-date and accurate data that can be shared with relevant stakeholders for appropriate response;
- Generation of data to characterize the safety of the COVID-19 vaccines in use;
- Identification, investigation, assessment and validation of safety signals and recommendation of appropriate public health interventions or other interventions; and
- High quality safety surveillance and maintenance of public and stakeholder confidence in vaccines and immunization.

The WHO defines Adverse Event Following Immunization (AEFI) as any untoward medical occurrence which follows immunization, and which does not necessarily have a causal relationship with the usage of the vaccine. If not rapidly and effectively dealt with, AEFIs can undermine confidence in a vaccine and ultimately have dramatic consequences for immunization coverage and disease incidence.

XI. RELATED STUDIES

The outbreak of coronavirus disease 2019 (COVID-19) in Wuhan, China, spreads globally, since its declaration by the World Health Organization (WHO) as a COVID-19 pandemic on March 11, 2020. COVID-19 vaccine is a crucial preventive approach that can halt this pandemic.

The present systematic review was aimed to assess the level of willingness to receive COVID-19 vaccine and its associated factors. A comprehensive literature search was conducted by using various online databases such as PubMed/ MEDLINE, HINARI, EMBASE, Google Scholar, Web of Science, Scopus, African journals, and Google for grey literature which were used to search the related articles up to the period of May 08, 2021.

The overall rate of participants' willingness to receive the COVID-19 vaccine was ranged from 27.7% to 91.3%, which was from Congo and China, respectively. Factors such as age, educational status, gender, income, residency, occupation, marital status, race/ethnicity, perceived risk of

COVID-19, trust in healthcare system, health insurance, norms, attitude towards vaccine, perceived benefit of vaccine, perceived vaccine barriers, selfefficacy, up-to-date on vaccinations, tested for COVID-19 in the past, perceived efficacy of the COVID-19 vaccination, recommended for vaccination, political leaning, perceived severity of COVID-19, perceived effectiveness of COVID-19 vaccine, belief that vaccination makes them feel less worried about COVID-19, believing in mandatory COVID-19 vaccination, perceived potential vaccine harms, presence of chronic disease, confidence, COVID-19 vaccine safety concern, working in healthcare field, believing vaccines can stop the pandemic, fear about COVID-19, cues to action, COVID-19 vaccine hesitancy, complacency, and receiving any vaccine in the past 5 years were associated with the willingness of receive COVID-19 vaccine. There were insufficient levels of willingness to receive COVID-19 vaccine, and several factors were associated with it. Health education should be provided concerning this vaccine to improve the willingness of the community.

While the clinical evidence of vaccine benefits is generally well established, the argument on the broader economic benefits resulting from investments in vaccines and immunization programs is murky and oftentimes, not well articulated. This is mostly true for low and middle-income countries. In this article, we examined literature evaluating both narrow and broad economic benefits of vaccines in LMICs from January 2000 to October 2016. A total of 177 studies were reviewed. Of these, 146 (82%) focused on understanding short-term direct and indirect impact (narrow economic benefits) of vaccines and 31 (18%) examined broader economic benefits which included willingness to pay for vaccines, outcomerelated productivity gains, and savings accrued from preventing vaccine preventable disease (VPD) outbreaks.

Virtually all studies reviewed concluded that implementation of various vaccine strategies were cost saving, cost-effective or, both cost saving and highly cost-effective under varying assumptions.

The studies were further analyzed under three broad vaccine categories which included those focusing on new and underutilized vaccines 125 (71%), vaccines at the prequalification stage 31 (17%) and the traditional vaccines deployed through the Expanded Programme on Immunization such as pentavalent diphtheria-pertussis-tetanus, and those against polio, tuberculosis and measles which accounted for 21 (12%) of the studies. There was unequal geographic distribution of these studies when analyzed by World Health Organization regions.

Regions like the Eastern Mediterranean and Europe had fewest studies completed (6) and (7) respectively. The lack of a standardized methodology and assumptions made cross-study comparisons and also broad generalization of some of the conclusions difficult. Most studies indicate that investments in immunization programs are cost effective and in some cases cost saving. Studies were skewed to narrow economic benefits. Wide variations in methods and assumptions made cross-country/study and regions comparisons difficult to achieve.

Although a safe and effective vaccine holds the greatest promise for resolving the COVID-19 pandemic, hesitancy to accept vaccines remains common. To explore vaccine acceptance decisions, we conducted a national survey of 1,000 people from all US states in August of 2020 and a replication in December of 2020. Using a 3 × 3 × 3 factorial experimental design, we estimated the impact of three factors: probability of 1) protection against COVID-19, 2) minor side effects, and 3) a serious adverse reactions. The outcome was respondents' reported likelihood of receiving a vaccine for the coronavirus.

Probability of vaccine efficacy (50%, 70%, or 90%) had the largest effect among the three factors. The probability of minor side effects (50%, 75%, 90%) including fever and sore arm, did not significantly influence likelihood of receiving the vaccine. The chances of a serious adverse reaction, such as temporary or permanent paralysis, had a small but significant effect. A serious adverse reaction rate of 1/100,000 was more likely to discourage vaccine use in comparison to rates of 1/million or 1/100 million. All interactions between the factors were nonsignificant. A replication following the announcement that vaccines were 95% effective

showed small, but significant increases in the likelihood of taking a vaccine. The main effects and interactions in the model remained unchanged. Expected benefit was more influential in respondents' decision making than expected side effects. The absence of interaction effects suggests that respondents consider the side effects and benefits independently.

The study of Diamla (2017) basically aim to determine the patients' safety on immunization and to assess community health nurses' awareness on safe vaccine administration provided in rural health units in the selected municipalities of Lanao del Sur. Generally, the results implied that the respondent's professional profile such as sex, highest educational attainment, numbers of trainings and seminars on immunizations attended and years in service have no significant relationship between the respondent's awareness on safe vaccine administration on the selected municipalities of Lanao del Sur in terms of vaccine, potency, temperature, storage, sustainability of electric power, distance travelled during the delivery of vaccines, dosage, skin preparations and route. The study results revealed that there is no significant relationship between the respondents' sex, highest educational attainment, years in service and number of trainings, and their awareness on the patients' safe vaccine administration in terms of vaccines, potency, temperature, storage, sustainability of electric power, distance travelled during the delivery of vaccines, dosage, skin preparations and route. Moreover, the findings implied that the number of trainings attended by the respondents have significant relationship to the respondent's awareness on patient's safe vaccine administration in terms of vaccine transport and dosage. Further, the respondent's highest educational attainment have a significant relationship on their awareness on safe vaccine administration in terms of vaccine. The study concluded that the patients on immunizations in the selected municipalities of Lanao del Sur are receiving a safe vaccine administered by the registered community health nurses as evidence by their awareness and good satisfaction rate from the patient's mothers.

XII. RESEARCH METHODOLOGY

This chapter presents the research design, locale and respondents, as well as sampling procedure, and the research instrument and data gathering procedure.

XIII. RESEARCH DESIGN

This study used the non-experimental, quantitative, descriptive-correlational approach where the researchers used a descriptive survey. This approach is used to describe variables in a certain phenomenon. The researchers wanted to identify the community health nurse's awareness on the safe COVID-19 vaccine administration.

In this study, the researchers used a standardized questionnaire with corresponding standardized score scale for the evaluation of the respondents' awareness on the safe COVID-19 vaccine administration.

XIV. LOCALE OF THE STUDY

The study was conducted in the Integrated Provincial Health Office and the City Health Office in Marawi City. They were selected purposively by the researcher.

Marawi, officially the Islamic City of Marawi, is a 4th class component city and the capital of the Philippine province of Lanao del Sur. The population was estimated to be 207,010 according to the 2020 census. The people of Marawi are known as Maranaos and speak the Maranao language. They are named after Lake Lanao, also known as Meranau in their language, on the shores of which Marawi is located. Due to its higher elevation and cooler climate, the city is also known as the "Summer Capital of the South," a moniker it shares with Malaybalay, which legally holds the title.

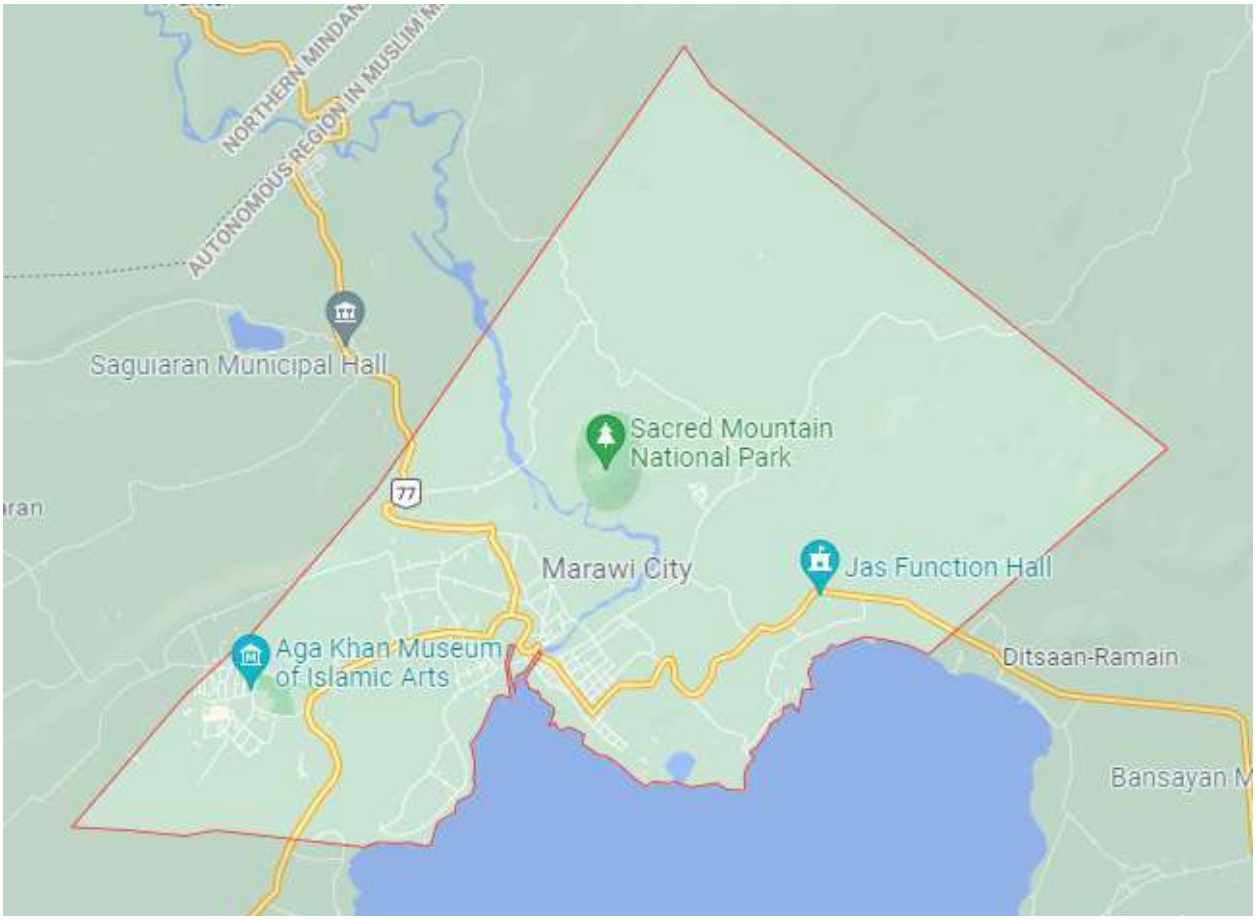

Figure 2: Map of Marawi City

XV. RESPONDENTS OF THE STUDY

The respondents of the study were the selected fifty (50) Registered Community Health Nurses who are assigned to administer the COVID-19 vaccines in the Integrated Provincial Health Office and City Health Office, Marawi City. The selection of the participants will be based on the following: 1) the nurse is assigned in the selected rural health units; 2) the nurse has been administrating COVID-19 vaccine and; 3) the nurse has attended trainings and seminars in administering the COVID-19 vaccine.

Sampling Procedure

The respondents for this study was chosen via purposive sampling by the researchers. Purposive sampling (also known as judgment, selective, or subjective sampling) is a sampling approach in which the researcher chooses members of the population to participate in the study based on his or her own judgment. Purposive sampling is a non-probability sampling method in which "items selected for the sample are chosen based on the researcher's judgment." Researchers frequently feel that by applying sound judgment, they can acquire a representative sample and save time and money."

Research Instrument

The instrument used for the study is a survey questionnaire which was adapted and modified by the researchers from "Community Health Nurses' Awareness as Determinants to the Safe Administration of Vaccines in the Selected Municipalities of Lanao del Sur" by Mohammad Ryan L. Diamla. The questionnaire was adapted by reviewing the guidelines and standards set by the Department of Health and the World Health Organization pertaining to safe administration of vaccine.

The questionnaire's content is the respondents' professional profile and the questions about their awareness on the safety administration of COVID-19 vaccine as perceived by the

respondents in terms of vaccines, potency, temperature, storage, sustainability of electric power, distance travelled during the transport and delivery of vaccines, dosage, skin preparations, and route.

Before the questionnaires were finalized for pilot testing was done. Reliability analysis can be defined as the consistency of measurement with the extent to which results were similar over different forms of the same instruments or occasions of data collection. Cronbach's Alpha was used in the reliability analysis as it is the most common form of internal consistency reliability coefficient. The value of Cronbach's Alpha should be at least 0.70 or higher in order to retain the item in an adequate scale. For this study, the value of the Cronbach's Alpha was 0.980. This means that the questions on the survey questionnaire have an *excellent* rate in terms of its Internal Consistency.

Table 1: Reliability Test of the Survey Questionnaire using Cronbach's Alpha

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.980	0.987	65

Data Gathering Procedure

The researcher made use of the relevant records of studies and researches that are significant and related to the present study. The researcher also made use of a survey questionnaire to get the primary data needed in the study.

Protocol was followed by sending a consent letter to the offices and obtaining informed consent from the participants prior to the conduct of the data gathering. The researcher also informed the respondents that the during the conduct of the study, research ethics will be maintained. Thus, all information given by the respondents was kept with utmost confidentiality.

Upon approval of the permit to conduct the study, the survey questionnaires was personally distributed by the researchers to the participants following the important health protocols such as social distancing, wearing of face mask and face shield, among others.

After gathering the data, the data was tabulated and submitted to the statistician for analysis and interpretation.

Table 2: Scoring Procedure

Range	Scale	Verbal Interpretation
2.34 – 3.00	3	Agree
1.67 – 2.33	2	Undecided
1.00 – 1.66	1	Disagree

XVI. STATISTICAL TOOLS

The researchers used relevant statistical tool for data interpretation in order to arrive at an accurate and definite interpretation of results. The statistical tools utilized are the following:

Frequency Count and Percentage: This is a common tool most especially for descriptive studies. This was employed to compute for the numbers in describing the respondent's professional profile as well as their responses to specific statements.

$$\text{Percentage} = \frac{f}{n} \text{ x } 100$$

where:

f = numbers of respondents
n = number of populations
100 = constant value

Weighted Mean and Standard Deviation: It is an average that is used to derive the central tendency of the data in question. It is determined by adding all the data points in a population and then dividing the total by the number of points. It is

used to determine the respondents' level of awareness in safe COVID-19 vaccine administration.

Formula

$$WX = \frac{\Sigma wx}{\Sigma w}$$

where:
WX = weighted mean
w = the weight
x = the value
n = numbers of respondents

Chi-Square Test: This is used to determine the relationship between the two categorical variables.

Pearson Product Moment Correlation: It is a measure to determine the relationship between two quantitative variables and the degree to which the two variables coincide with one another, that is, the extent to which two variables are linearly related: changes in one variable correspond to changes in another variable. This is used to determine the relationship between the two variables.

XVI. PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This includes the presentation, analysis and interpretation of data that have been gathered from the questionnaires distributed to the respondents. This also contains the presentation of data in tabular form along with their corresponding interpretations.

Problem 1: What is the professional profile of the respondents in terms of their:

1.1. Sex;
1.2. Highest Educational Attainment;
1.3. Trainings and Seminars on Vaccination; and
1.4. Number of Years in Service

Table 3: Frequency and Percentage of Sex

Sex	Frequency	Percentage
Male	14	28.0
Female	36	72.0
Total	50	100.0

Table 3 presents the distribution of respondents as to their sex. Results revealed that fourteen (14 or 28%) of the respondents were male and thirty-six (36 or 72%) were female. This implies that majority of the respondents were female. Hence, most of the nurses in the Integrated Provincial Health Office and City Health Office were female. Meadows et al. (2000)'s study supports this, indicating that the current nursing staff believes the profession will continue to be dominated by women for the foreseeable future.

Table 4: Frequency and Percentage of Highest Educational Attainment

Highest Educational Attainment	Frequency	Percentage
College Degree	45	90.0
Master's Degree	3	6.0
Doctorate Degree	2	4.0
Total	50	100.0

Table 4 presents the distribution of respondents as to their highest educational attainment. Results showed that forty-five (45 or 90%) of the respondents were college degree holder, three (3 or 6%) were master's degree holder, and two (2 or 4%) were doctorate degree holder. This indicates

that majority of the respondents were college degree holder. Thus, the highest educational attainment of most nurses in the Integrated Provincial Health Office and City Health Office were college degree.

Based on the October 2013 Labor Force Survey, majority of the workers in the service sectors, such as being a nurse, are female (Philippine Statistics Office, 2013).

Table 5: Frequency and Percentage of the Number of Trainings and Seminars on Vaccination Attended

Number of Trainings and Seminars Attended	Frequency	Percentage
1 – 3	33	66.0
4 – 6	14	28.0
7 – 8	2	4.0
9 and above	1	2.0
Total	50	100.0

Table 5 presents the distribution of respondents as to the number of trainings and seminars attended. Results showed that thirty-three (33 or 66%) of the respondents have attended 1 – 3 trainings and seminars on vaccination, fourteen (14 or 28%) have attended 4 – 6 trainings and seminars, two (2 or 4%) have attended 7 – 8 trainings and seminars, and one (1 or 2%) have attended more than 9 trainings and seminars. This implies that majority of the respondents have attended 1 – 3 trainings and seminars on vaccination. Thus, most nurses in the Integrated Provincial Health Office and City Health Office have attended at least one training on vaccination, which makes them qualified to be a nurse vaccinator.

Table 6: Frequency and Percentage Distribution of the Respondents as to the Years in Service

	Frequency	Percentage
6 months – 1 year	10	20.0
1 year and 1 month – 2 years	7	14.0
2 years and 1 month – 3 years	7	14.0
3 years and 1 month – 4 years	3	6.0
4 years and 1 month, and above	23	46.0
Total	50	100.0

Table 6 presents the distribution of respondents as to years in service. Results revealed that ten (10 or 20%) of the respondents were in service for 6 months – 1 year, seven (7 or 14%) were both 1 years and 1 month – 2 years and 2 years and 1 month – 3 years in service, three (3 or 6%) were 3 years and 1 month – 4 years in service, and twenty-three (23 or 46%) were in service for more than 4 years and 1 month. This shows that most of the respondents were in service for more than 4 years and 1 month. This further implies that majority of the nurses in the Integrated Provincial Health Office and City Health Office have a long-term experience as a nurse and are eligible to be nurse vaccinators.

Problem 2: What is the respondent's awareness on COVID-19 Pre-Vaccination in terms of:

2.1. Vaccines;
2.2. Potency;
2.3. Temperature;
2.4. Storage;
2.5. Sustainability of Electric Power;
2.6. Vaccine Transport;
2.7. Dosage;
2.8. Preparations; and
2.9. Route and Site?

Table 7: Awareness on COVID-19 Pre-Vaccination in terms of Vaccines

Indicators	Mean (n = 50)	Quantitative Description	Rank
1. Vaccination is safe and effective.	2.86	Agree	2
2. All vaccines undergo rigid trials by doctors, scientists and government to ensure its safety.	2.86	Agree	2
3. The vaccine-preventable disease such as COVID-19 remains a threat, thus it is better to be protected.	2.84	Agree	3
4. Vaccination protects both children and adults from serious illness and complication of COVID-19.	2.70	Agree	5
5. Vaccination prevents the outbreak of COVID-19.	2.78	Agree	4
6. Vaccines are among the most effective public health and medical strategies for protecting and preserving health.	2.88	Agree	1
Total	2.82	Agree	

Table 7 presents the awareness on COVID-19 pre-vaccination in terms of vaccines. Results revealed that the responses of the respondents were interpreted as "agree" with a total weighted mean of 2.82 based on the formulated scaling.

The six (6) listed indicators on the awareness on COVID-19 vaccination in terms of pre-vaccination vaccines above had three (3) leading indicators based on their respective means.

The sixth indicator, which ranked 1st, "Vaccines are among the most effective public health and medical strategies for protecting and preserving health", with total weighted mean of 2.82 was interpreted as "agree". The first and second indicators, which ranked 2nd, "Vaccination is safe and effective" and "All vaccines undergo rigid trials by doctors, scientists and government to ensure its safety", with total weighted mean of 2.86 was interpreted as "agree". Following closely are the indicators that ranked third, fourth and fifth. The third indicator, "The vaccine-preventable disease such as COVID-19 remains a threat, thus it is better to be protected", with total weighted mean of 2.84 was interpreted as "agree", the fifth indicator, "Vaccination prevents the outbreak of COVID-19" with total weighted mean of 2.78 was interpreted as "agree", and the fourth indicator, "Vaccination protects both children and adults from serious illness and complication of COVID-19", with total weighted mean of 2.70 was also interpreted as "agree."

Based on the interpretation, this implies that nurse vaccinators are fully aware of the safety and effectiveness of the vaccines that they will be administering to the patients and the community. The three (3) leading indicators indicates the safety and effectiveness of the vaccines. On the other hand, the rank third to fifth indicates that the vaccines are good in preventing diseases such as the COVID-19.

Vaccine acceptability among health care workers is higher at the early stage of vaccination, and they have excellent knowledge of COVID-19 and COVID-19-appropriate behavior. This will directly improve the level and acceptability of vaccines among the country's other health care workers and the general population (Dara et al., 2021).

Table 8: Awareness on COVID-19 Pre-Vaccination in terms of Potency

Indicators	Mean (n = 50)	Quantitative Description	Rank
1. The effect of vaccines coming from the main office is the same with what is supplied in the rural health units.	2.94	Agree	1
2. The potency of medicines distributed in rural health units is in its efficiency to cure.	2.76	Agree	4
3. Vaccines are prepared safely.	2.94	Agree	1
4. Unopened vaccine vials are returned to refrigerator.	2.76	Agree	4
5. Check freeze indicator (if freezing warning appears, perform shake test).	2.68	Agree	5
6. Proper handling and storage of vaccines can affect the potency of medications.	2.84	Agree	3
7. Proper temperature monitoring can affect vaccines' potency.	2.84	Agree	3
8. Discard vaccines when its color change, its characteristics change into cloudy and bubbly.	2.92	Agree	2
Total	2.84	Agree	

Table 8 presents the awareness on COVID-19 pre-vaccination in terms of vaccine potency. Results revealed that the responses of the respondents were interpreted as "agree" with a total weighted mean of 2.84 based on the formulated scaling. The eight (8) listed indicators on the awareness on COVID-19 vaccination in terms of pre-vaccination vaccine potency above had three (3) leading indicators based on their respective means.

The first and third indicators, which ranked 1st, "The effect of vaccines coming from the main office is the same with what is supplied in the rural health units" and "Vaccines are prepared safely", with total weighted mean of 2.94 was interpreted as "agree". The eighth indicator, which ranked 2nd, "Discard vaccines when its color change, its characteristics change into cloudy and bubbly", with total weighted mean of 2.92 was interpreted as "agree".

Based on the interpretation, this implies that nurse vaccinators are fully aware of the potency of the vaccines that they will be administering to the patients and the community. The three (3) leading indicators suggests that the vaccines are capable in producing a predictable and expected level of immune response through its safe preparations and discarding when its color and characteristics have change.

To ensure the success of the vaccine delivery system, essential vaccine must be available and of high quality. A functional cold chain system is the only way to ensure vaccine quality. Vaccines are highly thermosensitive substances with a finite shelf life that degrades over time. If proper storage and temperature conditions are not maintained, this loss is irreversible and accelerates (Village Reach, 2014). Freezing or heat exposure can completely or irreversibly impair vaccine efficacy and increase the risk of side effects (Federal Ministry of Health, 2015).

Individuals will not be immunized against vaccine-preventable diseases if not potent vaccines are administered.

According to one study, nurses working in public health centers have adequate knowledge of vaccine storage, handling, and cold chain (El Shazly et al., 2016). Public health nurses' knowledge, understanding, and practices are important factors in preventing vaccine-related adverse events. Sufficient knowledge of the cold chain system, proper handling, and safe administration of vaccines are critical for preserving the vaccine's potency and effectiveness (El Shazly et al., 2016).

Table 9: Awareness on COVID-19 Pre-Vaccination in terms of Temperature

Indicators	Mean (n = 50)	Quantitative Description	Rank
1. COVID-19 vaccines require refrigeration with temperature ranges of +2°C to +8°C, -15°C to -24°C and to as low as -70°C to -80°C.	2.66	Agree	6
2. The potency of the majority of the vaccines can be affected adversely by storage temperatures that are too warm, these effects are usually more gradual, predictable, and smaller in magnitude than losses from temperature that are too cold.	2.68	Agree	5
3. Store vaccines at ideal temperatures.	2.96	Agree	1
4. Use insulated containers with packing material and a digital temperature monitoring device to store vaccine if a refrigerator is not available during immunization clinics.	2.86	Agree	3
5. Minimize the number of times that the insulated container is opened during immunization clinics.	2.84	Agree	4
6. Visually inspect the digital temperature monitoring device each time the insulated container is opened.	2.92	Agree	2
7. Monitor and record the temperature readings in the insulated container before, on and upon finishing the vaccine session.	2.92	Agree	2
Total	2.83	Agree	

Table 9 presents the awareness on COVID-19 pre-vaccination in terms of temperature. Results revealed that the responses of the respondents were interpreted as "agree" with a total weighted mean of 2.83 based on the formulated scaling.

The seven (7) listed indicators on the awareness on COVID-19 vaccination in terms of pre-vaccination temperature above had three (3) leading indicators based on their respective means.

The third indicator, which ranked 1st, "Store vaccines at ideal temperatures, with total weighted mean of 2.96 was interpreted as "agree". The sixth seventh indicators, which ranked 2nd, "Visually inspect the digital temperature monitoring device each time the insulated container is opened" and "Monitor and record the temperature readings in the insulated container before, on and upon finishing the vaccine session", with total weighted mean of 2.92 was interpreted as "agree".

Based on the interpretation, this implies that nurse vaccinators are aware of the required storage temperature needed for the vaccines that they will be administering to the patients and the community. The three (3) leading indicators suggests that the vaccine's storage temperature are being monitored from time to time to ensure that its potency are not adversely affected.

Because vaccines are very sensitive to suboptimal temperatures, proper cold chain monitoring with appropriate equipment is critical. If the temperature in cold chain equipment, such as the freezer and refrigerator, falls below or rises above the recommended temperature for vaccines stored in them, proper monitoring can detect this early and an appropriate measure can be taken to prevent vaccine damage (Ogboghodo et al., 2017).

According to one study, nurses working in public health centers have adequate knowledge of vaccine storage, handling, and cold chain (El Shazly et al., 2016). Public health nurses' knowledge, understanding, and practices are important factors in preventing vaccine-related adverse events. Sufficient knowledge of the cold chain system, proper handling, and safe administration of vaccines are critical for preserving the vaccine's potency and effectiveness (El Shazly et al., 2016).

Table 10: Awareness on COVID-19 Pre-Vaccination in terms of Storage

Indicators	Mean (n = 50)	Quantitative Description
1. COVID-19 vaccine storage units must be selected carefully and used properly.	2.96	Agree
2. Any refrigerator/freezer used for vaccine storage must maintain the required temperature range all throughout the vaccination period.	2.94	Agree
3. Place the vaccines in trays or uncovered containers for proper air flow.	2.30	Undecided
4. Keep vaccines in original boxes with lids closed to prevent exposure to light.	2.96	Agree
5. Put vaccines that are first to expire in front.	2.96	Agree
6. Don't put vaccines in doors or on the floor of the refrigerator/freezer.	2.70	Agree
7. The vaccine carrier prepared and lid should be closed tightly.	2.96	Agree
Total	2.83	Agree

Table 10 presents the awareness on COVID-19 pre-vaccination in terms of storage. Results revealed that the responses of the respondents were interpreted as "agree" with a total weighted mean of 2.83 based on the formulated scaling.

The seven (7) listed indicators on the awareness on COVID-19 vaccination in terms of pre-vaccination storage above had four (4) leading indicators based on their respective means.

The first, fourth, fifth and seventh indicators, which ranked 1st, "COVID-19 vaccine storage units must be selected carefully and used properly", "Keep vaccines in original boxes with lids closed to prevent exposure to light", "Put vaccines that are first to expire in front", and "The vaccine carrier prepared and lid should be closed tightly", with total weighted mean of 2.96 was interpreted as "agree". Moreover, the third indicator, "Place the vaccines in trays or uncovered containers for proper air flow" is the least indicator for vaccine storage as the respondents are "undecided", with a total weighted mean of 2.30.

Based on the interpretation, this implies that nurse vaccinators are aware of the required storage needed for the vaccines that they will be administering to the patients and the community.

The three (4) leading indicators suggests that the vaccine's storage should be safely secured to prevent any exposure to avoid contamination.

Earlier studies also found that respondents had a high level of knowledge about cold chain management particularly on vaccine storage (Yassin et al., 2019). The vaccine necessitates a dependable stock rotation technique and must be securely stored in a controlled climatic environment. The first-in, first-out (FEFO) stock rotation ensures that older stock is used up before new stock. Correct application of the FEFO rule ensures that vaccine potency is maintained and preserved to the greatest extent possible.

Furthermore, proper storage must include as little exposure to extreme heat and light as possible.

Furthermore, for some vaccines, which lose potency when exposed to heat, light, or humidity, proper vaccine storage is critical. As a result, all vaccines should be stored in the freezer or the refrigerator's body to maintain their potency (Jamison et al., 2006).

Table 11: Awareness on COVID-19 Pre-Vaccination in terms of Sustainability of Electric Power

Indicators	Mean (n = 50)	Quantitative Description
1. The proper temperature monitoring is a key to proper cold chain management and it includes electricity.	2.90	Agree
2. When a problem is discovered, the exposed vaccine is maintained at proper temperature while state or local health departments, or the vaccine manufacturers are contacted for guidance.	2.58	Agree
3. The written emergency retrieval and storage procedures are in place in case of equipment failures or power outages.	2.80	Agree
4. The power interruptions may alter the temperature of the refrigerator; thus it may alter the potency of vaccines.	2.84	Agree
5. The electric power has a major role in the maintenance of standard temperature for vaccine storage.	2.90	Agree
6. Do not open the refrigerator right after the electric interruptions (1-2 hours)	2.68	Agree
7. The facility must have generator as alternative to the source of electric power during electrical interruptions.	2.84	Agree
8. The facility has measures and alternatives in time of electric power interruptions.	2.92	Agree
9. 12 hours of electric interruptions may alter the effectiveness and potency of the vaccines.	2.80	Agree
10. If we have vaccines wastage due to electric power interruptions, we will make an incident report about the said wastage.	2.82	Agree
Total	2.81	Agree

Scaling: 1.00 – 1.66 Disagree 1.67 – 2.33 Undecided 2.34 – 3.00 Agree

Table 11 presents the awareness on COVID-19 pre-vaccination in terms of sustainability of electric power. Results revealed that the responses of the respondents were interpreted as "agree" with a total weighted mean of 2.81 based on the formulated scaling. The ten (10) listed indicators on the awareness on COVID-19 vaccination in terms of pre-vaccination sustainability of electric power above had three (3) leading indicators based on their respective means.

The eighth indicator, which ranked 1st, "The facility has measures and alternatives in time of electric power interruptions, with total weighted mean of 2.92 was interpreted as "agree". The first and fifth indicators, which ranked 2nd, "The proper temperature monitoring is a key to proper cold chain management and it includes electricity" and "The electric power has a major role in the maintenance of standard temperature for vaccine storage", with a total weighted mean of 2.90 was interpreted as "agree".

Based on the interpretation, this implies that nurse vaccinators are aware of the sustainability of electric power in the community. The three (3) leading indicators demonstrates that measures have been ensured to maintain the storage temperature of vaccines in times of power interruption.

According to Ogboghodo et al. (2017), the majority of those who worked in health facilities had access to electricity, but its supply was inconsistent in all of them. This could expose vaccines stored in refrigerators and freezers to changing storage temperatures. Respondents may be further discouraged from carrying out proper

cold chain management because of the stress of having to transfer vaccines to cold boxes or other health facilities with a standby generator every time there is a power outage.

Table 12: Awareness on COVID-19 Pre-Vaccination in terms of Vaccine Transport

Indicators	Mean (n = 50)	Quantitative Description	Rank
1. Transport all vaccines in an insulated container supplied by the DOH with appropriate packing configuration.	2.94	Agree	1
2. The insulated containers are internally validated to ensure that they are capable of maintaining the vaccine at the required temperatures for the required duration for transportation and/or storage.	2.92	Agree	2
3. There is documentation that shows that the insulated containers have been internally validated. This documentation may be provided from the manufacturer or produced from the board of health's testing.	2.94	Agree	1
4. Ensure that all insulated containers storing vaccines have digital temperature monitoring device.	2.94	Agree	1
5. Clearly mark all insulated containers storing vaccines in a visible location with the following label: "VACCINES – REFRIGERATE IMMEDIATELY." Before placing vaccines into the refrigerator, they must be removed from the insulated containers.	2.94	Agree	1
6. Do not transport vaccines in insulated containers in the trunk of a car due to the risk of exposure to extreme temperatures.	2.78	Agree	3
7. The distance travelled by the health workers to deliver the vaccines do not affect the potency of the vaccines.	2.36	Agree	6
8. The distance travelled has nothing to do with the effectiveness of the vaccines.	2.38	Agree	5
9. The distance travelled and hours of travel do not affect the potency and effects of the vaccines as long as the storage practices are appropriate and maintained by the health workers.	2.60	Agree	4
10. Check the condition of vaccines upon receiving it, especially when it is from a long-distance travel.	2.92	Agree	2
Total	2.77	Agree	

Scaling: 1.00 – 1.66 Disagree 1.67 – 2.33 Undecided 2.34 – 3.00 Agree

Table 12 presents the awareness on COVID-19 pre-vaccination in terms of vaccine transport. Results revealed that the responses of the respondents were interpreted as "agree" with a total weighted mean of 2.77 based on the formulated scaling. The ten (10) listed indicators on the awareness on COVID-19 vaccination in terms of pre-vaccination vaccine transport above had four (4) leading indicators based on their respective means.

The first, third, fourth and fifth indicators, which ranked 1st, "Transport all vaccines in an insulated container supplied by the DOH with appropriate packing configuration", "There is documentation that shows that the insulated containers have been internally validated. This documentation may be provided from the manufacturer or produced from the board of health's testing", "Ensure that all insulated containers storing vaccines have digital temperature monitoring device" and "Clearly mark all insulated containers storing vaccines in a visible location with the following label: "VACCINES – REFRIGERATE

IMMEDIATELY." Before placing vaccines into the refrigerator, they must be removed from the insulated containers", with total weighted mean of 2.94 was interpreted as "agree".

Based on the interpretation, this implies that nurse vaccinators are aware of the correct procedures and guidelines in safely transporting vaccines from one place to another. The four (4) leading indicators demonstrates that procedures are done in securing the vaccines' insulated containers during its transport.

The cold chain is comprised of three major components: transport and storage equipment, trained personnel, and effective management procedures. To ensure safe vaccine transport and storage, all three elements must work together (CDC, 2008). According to a study conducted in India, vaccine handling at outreach sessions is required to ensure optimal service delivery (Das et al., 2018). According to a study conducted in New York, vaccines are delicate products that can be easily destroyed if handled incorrectly. Vaccine management entails transporting and distributing vaccines from manufacturers to patients.

Distribution, storage, handling, and transport management are all aspects of vaccine management (Jamison et al., 2006).

Table 13: Awareness on COVID-19 Pre-Vaccination in terms of Dosage

Indicators	Mean (n = 50)	Quantitative Description	Rank
1. The distribution of COVID-19 vaccines is according to dosage.	2.86	Agree	1
2. There is corresponding dosage for adults and children.	2.84	Agree	2
3. All individuals are required to have 2 doses of COVID-19 vaccines.	2.66	Agree	3
Total	2.79	Agree	

Scaling: 1.00 – 1.66 Disagree 1.67 – 2.33 Undecided 2.34 – 3.00 Agree

Table 13 presents the awareness on COVID-19 pre-vaccination in terms of dosage. Results revealed that the responses of the respondents were interpreted as "agree" with a total weighted mean of 2.79 based on the formulated scaling.

The first indicator, which ranked 1st, "The distribution of COVID-19 vaccines is according to dosage", with total weighted mean of 2.86 was interpreted as "agree". The second indicator, which ranked 2nd, "There is corresponding dosage for adults and children", with total weighted mean of 2.84 was interpreted as "agree". The third indicator, which ranked 3rd, "All individuals are required to have 2 doses of COVID-19 vaccines", with total weighted mean of 2.66 was interpreted as "agree".

Based on the interpretation, this implies that nurse vaccinators are aware of the correct dosage to be administered to the patients and the community. The three (3) indicators suggests that there are guidelines implemented for the correct dosage and number of doses to be administered to the people, particularly for children and adults.

A study in Egypt found that community health nurses have a higher knowledge score in terms of vaccine preparation, handling, administration, scheduling, dosage, routes, and contraindications of the various vaccines routinely used for children under the age of five in public health center facilities (El Shazly et al., 2016).

Table 14: Awareness on COVID-19 Pre-Vaccination in terms of Preparations

Indicators	Mean (n = 50)	Quantitative Description	Rank
1. The healthcare workers or vaccinator wash hands with soap.	2.94	Agree	2
2. The care taker instructed the client about the procedure to lessen anxiety and encourage cooperation.	2.94	Agree	2
3. In vaccine segregation we determined which vaccines have previously been received.	2.96	Agree	1
4. The vaccines' contraindications checked.	2.96	Agree	1
5. The vaccines should be prepared safely.	2.96	Agree	1
6. The required quantities of vaccine vials taken out of the refrigerator shall be in specific order.	2.84	Agree	3
7. The diluents taken out and matched with the appropriate vaccines.	2.84	Agree	3
8. Checked if vaccines are safe to use (label, expiration date, vaccine vial monitor)	2.96	Agree	1
9. The equipment for the vaccination should be collected and prepared (auto-disabled syringes, register, cards, tally sheets)	2.96	Agree	1
Total	2.93	Agree	

Scaling: 1.00 – 1.66 Disagree 1.67 – 2.33 Undecided 2.34 – 3.00 Agree

Table 14 presents the awareness on COVID-19 pre-vaccination in terms of preparations. Results revealed that the responses of the respondents were interpreted as "agree" with a total weighted mean of 2.93 based on the formulated scaling.

The nine (9) listed indicators on the awareness on COVID-19 vaccination in terms of pre-vaccination preparations above had five (5) leading indicators based on their respective means.

The third, fourth, fifth, eighth and ninth indicators, which ranked 1st, "In vaccine segregation we determined which vaccines have previously been received", "The vaccines' contrain- dications checked", "The vaccines should be prepared safely", "Checked if vaccines are safe to use (label, expiration date, vaccine vial monitor)"and "The equipment for the vaccination should be collected and prepared (auto-disabled syringes, register, cards, tally sheets)", with total weighted mean of 2.93 was interpreted "agree".

Based on the interpretation, this implies that nurse vaccinators are fully aware of the preparations to be done before administering the vaccines. The five (5) leading indicators suggests that vaccines are securely checked and prepared before its administration.

A study in Egypt found that community health nurses have a higher knowledge score in terms of vaccine preparation, handling, administration, scheduling, dosage, routes, and contraindications of the various vaccines routinely used for children under the age of five in public health center facilities (El Shazly et al., 2016).

Table 15: Awareness on COVID-19 Pre-Vaccination in terms of Route and Site

Indicators	Mean (n = 50)	Quantitative Description	Rank
1. Intramuscular (IM) injection is the recommended route for COVID-19 vaccines.	2.96	Agree	1
Total	2.96	Agree	

Scaling: 1.00 – 1.66 Disagree 1.67 – 2.33 Undecided 2.34 – 3.00 Agree

Table 15 presents the awareness on COVID-19 vaccination in terms of pre-vaccination route and site. Results revealed that the responses of the respondents were interpreted as "agree" with a total weighted mean of 2.96 based on the formulated scaling.

The indicator, "Intramuscular (IM) injection is the recommended route for COVID-19 vaccines", has a total weighted mean of 2.96 was interpreted as "agree". Based on the interpretation, this implies that nurse vaccinators are fully aware of the injection route in administering COVID-19 vaccines. The indicator suggests that there should only be one route and site in administering the COVID-19 vaccine which is through the intramuscular injection.

A study in Egypt found that community health nurses have a higher knowledge score in terms of vaccine preparation, handling, administration, scheduling, dosage, routes, and contraindications of the various vaccines routinely used for children under the age of five in public health center facilities (El Shazly et al., 2016).

Problem 3: What is the respondent's awareness on COVID-19 Vaccination in terms of Post-Vaccination Monitoring and Surveillance?

Table 16: Awareness in Post-Vaccination Monitoring and Surveillance

Indicators	Mean (n = 50)	Quantitative Description	Rank
1. The patient shall be observed for one (1) hour after the vaccination.	2.92	Agree	2
2. Vital signs should be monitored every fifteen (15) minutes.	2.84	Agree	3
3. Use post-vaccination checklist to monitor the patient	2.96	Agree	1
4. Respond and give first aid to patient with Adverse Events Following Immunization (AEFI)	2.96	Agree	1
Total	2.92	Agree	

Scaling: 1.00 – 1.66 Disagree 1.67 – 2.33 Undecided 2.34 – 3.00 Agree

Table 16 presents the awareness on COVID-19 vaccination in terms of post-vaccination monitoring and surveillance. Results revealed that the responses of the respondents were interpreted as "agree" with a total weighted mean of 2.92 based on the formulated scaling.

The third and fourth indicators, which ranked 1st, "Use post-vaccination checklist to monitor the patient", and "Respond and give first aid to patient with Adverse Events Following Immunization (AEFI)", with total weighted mean of 2.96 was interpreted as "agree". The first indicator, which ranked 2nd, "The patient shall be observed for one (1) hour after the vaccination", with total weighted mean of 2.92 was interpreted as "agree". The second indicator, which ranked 3rd, "Vital signs should be monitored every fifteen (15) minutes", with total weighted mean of 2.84 was interpreted as "agree".

Based on the interpretation, this implies that nurse vaccinators are fully aware of the post-vaccination monitoring procedures to be done to ensure the safety of the patients and those who have been administered the vaccine. The indicators suggest that a post-vaccination monitoring checklist has been imposed to check the possible effect of the vaccines to the patient and vaccinators are able to respond to any adverse effect to the patient.

Problem 4: Is there a significant relationship between the respondent's professional profile and the determinants to safe COVID-19 vaccine administration?

Table 17: Relationship between the Respondent's Profile and the Determinants to safe COVID-19 Vaccine Administration

Professional Profile	Safe Vaccine Administration	Chi-square value	p-value	Interpretation
Sex	Vaccine	1.300	0.861	Not Significant
Highest Educational Attainment		2.381	0.967	Not Significant
Number of Trainings Attended		10.622	0.832	Not Significant
Years in Service		14.864	0.980	Not Significant
Sex	Potency	2.907	0.714	Not Significant
Highest Educational Attainment		3.907	0.951	Not Significant
Number of Trainings Attended		13.182	0.869	Not Significant
Years in Service		18.043	0.992	Not Significant
Sex	Temperature	1.957	0.744	Not Significant
Highest Educational Attainment		3.405	0.906	Not Significant
Number of Trainings Attended		8.709	0.925	Not Significant
Years in Service		16.649	0.955	Not Significant
Sex	Storage	1.951	0.745	Not Significant
Highest Educational Attainment		4.733	0.786	Not Significant
Number of Trainings Attended		10.011	0.866	Not Significant
Years in Service		30.584	0.336	Not Significant
Sex	Sustainability of Electric Power	5.753	0.451	Not Significant
Highest Educational Attainment		3.155	0.994	Not Significant
Number of Trainings Attended		36.160	0.053	Not Significant
Years in Service		49.892	0.188	Not Significant
Sex	Vaccine Transport	6.890	0.440	Not Significant
Highest Educational Attainment		4.013	0.995	Not Significant
Number of Trainings Attended		22.583	0.754	Not Significant
Years in Service		66.156	0.052	Not Significant
Sex	Dosage	2.257	0.521	Not Significant
Highest Educational Attainment		2.160	0.904	Not Significant
Number of Trainings Attended		10.976	0.531	Not Significant
Years in Service		31.331	0.068	Not Significant
Sex	Preparations	3.775	0.437	Not Significant
Highest Educational Attainment		1.058	0.998	Not Significant
Number of Trainings Attended		9.361	0.898	Not Significant
Years in Service		13.703	0.989	Not Significant
Sex	Route and Site	0.397	0.529	Not Significant
Highest Educational Attainment		0.113	0.945	Not Significant
Number of Trainings Attended		1.198	0.878	Not Significant
Years in Service		3.231	0.863	Not Significant

$p<0.05$, significant $p>0.05$, not significant

Table 17 presents the relationship between the respondent's professional profile and the determinants to safe COVID-19 vaccine administration. Results revealed that there is no

significant relationship between the respondent's professional profile and the determinants to safe COVID-19 vaccine administration since the p-values are greater than the 0.05 level of significance.

This implies that the determinants to safe COVID-19 vaccine administration are not based on the nurses' sex, educational attainment, trainings and seminars attended and their number of years in service.

This contradicts the findings of Diamla et al. (2020), who discovered a significant relationship between nurses' demographic profile (education and number of trainings attended) and level of vaccine safety awareness (vaccine preparation and transportation). Vaccine administration requires a significant amount of education, knowledge, and practice. Community nurses are knowledgeable about vaccine administration and must administer vaccines to children in the proper manner (Mahony et al., 1999). A study conducted in Egypt discovered that nurses with a higher educational attainment (bachelor degree in nursing) had a higher knowledge score in regards to vaccine preparation than diploma graduate nurses. Indeed, knowledge, skills, and abilities are required to complete a task and improve one's clinical performance (Feliciano et al., 2019a).

Problem 5: Is there a significant relationship between the level of awareness among nurses on COVID-19 pre-vaccination and the determinants to safe COVID-19 vaccine administration?

Table 18: Relationship between the Level of Awareness among Nurses on Pre-Vaccination and the Determinants to Safe COVID-19 Vaccine Administration

	Leve of Awareness in Pre-Vaccination		
	Correlation Coefficient	p-value	Interpretation
Vaccine	0.813	0.000	Significant
Potency	0.902	0.000	Significant
Temperature	0.930	0.000	Significant
Storage	0.945	0.000	Significant
Sustainability of Electric Power	0.852	0.000	Significant
Vaccine Transport	0.859	0.000	Significant
Dosage	0.560	0.000	Significant
Preparation	0.950	0.000	Significant
Route and Site	0.916	0.000	Significant

Table 18 presents the relationship between the level of awareness among nurses on COVID-19 pre-vaccination and the determinants to safe COVID-19 vaccine administration. Results revealed that there is a significant relationship between the level of awareness among nurses on COVID-19 pre-vaccination and the determinants to safe COVID-19 vaccine administration since the p-values are less than the 0.05 level of significance.

This implies that the determinants to safe COVID-19 vaccine administration has a positive impact to the level of awareness in pre-vaccination among nurses.

The interaction between the patient and the health care provider is critical for maintaining vaccine trust. Several studies have found that health professionals' vaccine knowledge and attitudes are important factors in their own immunization, their intention to recommend the vaccine to their patients, and their patients' acceptance of vaccines (Dube et al., 2013).

Problem 6: Is there a significant relationship between the level of awareness among nurses on COVID-19 vaccination in terms post-vaccination monitoring and surveillance, and the determinants to safe COVID-19 vaccine administration?

Table 19: Relationship between the Level of Awareness among Nurses on COVID-19 Post-Vaccination and the Determinants to Safe COVID-19 Vaccine Administration

	Leve of Awareness in Post-Vaccination		
	Correlation Coefficient	p-value	Interpretation
Vaccine	0.617	0.000	Significant
Potency	0.900	0.000	Significant
Temperature	0.798	0.000	Significant
Storage	0.803	0.000	Significant
Sustainability of Electric Power	0.689	0.000	Significant
Vaccine Transport	0.687	0.000	Significant
Dosage	0.703	0.000	Significant
Preparation	0.916	0.000	Significant
Route and Site	0.949	0.000	Significant

$p<0.05$, significant

Table 19 presents the relationship between the level of awareness among nurses on COVID-19 vaccination in terms post-vaccination monitoring and surveillance, and the determinants to safe COVID-19 vaccine administration. Results revealed that there is a significant relationship between the level of awareness among nurses on COVID-19 vaccination in terms post-vaccination monitoring and surveillance, and the determinants to safe COVID-19 vaccine administration since the p-values are less than the 0.05 level of significance.

This implies that the determinants to safe COVID-19 vaccine administration has a positive impact to the level of awareness on COVID-19 vaccination in terms of post-vaccination among nurses.

The nurses, particularly those with long tenure, had positive attitudes toward vaccines and a high level of knowledge. The nurses are aware of the level of individual risk and their critical role as promoters of the general population's vaccination strategy. Continuing vaccine-related education should be linked to healthcare facilities in order to raise nurses' vaccination awareness (Tuells et al., 2021).

XVII. SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary, findings, and the corresponding conclusion derived in the conduct of the study. It also provides recommendations that could be pursued by the researchers.

SUMMARY

This study aimed to determine the level of awareness of the nurses' vaccinators in administering a safe COVID-19 vaccine in the Integrated Provincial Health Office and the City Health Office in Marawi City. Specifically, it has the following objectives: (1) Analyzed the professional profile of the respondents in terms of their sex, highest educational attainment, trainings and seminars on vaccination attended, and number of years in service; (2) Respondent's awareness on COVID-19 Pre-Vaccination in terms of vaccines, potency, temperature, storage, sustainability of electric power, vaccine transport, dosage, preparations and route and site; (3) Respondent's awareness on COVID-19 Vaccination in terms of Post-Vaccination Monitoring and Surveillance; (4) Significant relationship between the respondent's professional profile and the level of awareness of health care professionals in pre-vaccination; and

(5) Significant relationship between the respondent's professional profile and the level of awareness of health care professionals in post-vaccination monitoring and surveillance.

This study used the non-experimental, quantitative, descriptive-correlational approach where the researchers used a descriptive survey.

The researchers conducted their study in the Integrated Provincial Health Office and the City Health Office in Marawi City. The respondents of the study are the selected fifty (50) Registered Community Health Nurses who are assigned to administer the COVID-19 vaccines from the said offices. A standardized questionnaire corresponding standardized score scale was used for the evaluation of the respondents' awareness on the safe COVID-19 vaccine administration.

Findings

From the data gathered, the following findings emerged.

1. Profile of the Respondents

a) Majority of the respondents were female (72%).
b) Majority of the respondents were college degree holder (90%).
c) Majority of the respondents have attended 1 – 3 trainings and seminars on vaccination (66%).
d) Most of the respondents were in service for more than 4 years and 1 month (46%).

2. Level of Awareness on COVID-19 Pre-Vaccination

e) In terms of vaccines, results revealed that the responses of the respondents were interpreted as "agree" with a total weighted mean of 2.82.
f) In terms of potency, responses of the respondents were interpreted as "agree" with a total weighted mean of 2.84.
g) In terms of temperature, responses of the respondents were interpreted as "agree" with a total weighted mean of 2.83.
h) In terms of storage, responses of the respondents were interpreted as "agree" with a total weighted mean of 2.83.
i) In terms of sustainability of electric power, responses of the respondents were interpreted as "agree" with a total weighted mean of 2.81.
j) In terms of vaccine transport, responses of the respondents were interpreted as "agree" with a total weighted mean of 2.77.
k) In terms of dosage, responses of the respondents were interpreted as "agree" with a total weighted mean of 2.79.
l) In terms of preparations, responses of the respondents were interpreted as "agree" with a total weighted mean of 2.93.
m) In terms of route and site, responponses the respondents were interpreted as " with a total weighted mean of 2.96.

3. Level of Awareness on COVID-19 Post-Vaccination Monitoring and Surveillance

a) In terms of post-vaccination monitoring and surveillance, responses of the respondents were interpreted as "agree" with a total weighted mean of 2.92.

4. Relationship between the respondent's professional profile and the determinants to safe COVID-19 vaccine administration

There is no significant relationship between relationship between the respondent's professional profile and the determinants to safe COVID-19 vaccine administration.

5. Relationship between the level of awareness among nurses on COVID-19 pre-vaccination and the determinants to safe COVID-19 vaccine administration

There is a significant relationship between the level of awareness among nurses on COVID-19 pre-vaccination and the determinants to safe COVID-19 vaccine administration.

6. Relationship between the level of awareness among nurses on COVID-19 vaccination in terms post-vaccination monitoring and surveillance, and the determinants to safe COVID-19 vaccine administration

There is a significant relationship between the level of awareness among nurses on COVID-19 vaccination in terms post-vaccination monitoring and surveillance, and the determinants to safe COVID-19 vaccine administration.

XVIII. CONCLUSIONS

Vaccination is one of the most effective methods of preventing infections in the general population and for public health in general. This practice provides direct benefits from vaccines as well as a form of indirect protection for people who are not immune (herd or social immunity). In response to the COVID-19 pandemic, vaccines were recently released in an emergency release to prevent the virus's spread. The COVID-19 vaccines protect against disease by inducing an immune response to the SARS-Cov-2 virus. Vaccination increases the likelihood of developing the illness and its consequences. As a result, the goal of this study is to raise awareness among healthcare professionals about the importance of proper and efficient administration, including the safekeeping of COVID-19 vaccines prior to administering them to community patients.

Given the demographics of the respondents, it is significant that the majority of them are female and hold a college degree. These are reliable statistics because female nurses outnumber male nurses in the Philippines. Furthermore, because the vast majority of respondents have been in the service for more than four years and have attended at least one training and seminar, they are eligible to become nurse vaccinators. In general, nurse vaccinators in Lanao del Sur are well-versed in vaccine administration.

Furthermore, it can be concluded that nurse vaccinators in Lanao del Sur are fully aware of the safe administration of vaccines from the pre-vaccination period to the post-vaccination monitoring and surveillance. It is critical for nurse vaccinators to be fully aware of these issues in order to avoid causing harm to patients.

XIX. RECOMMENDATIONS

Based on the findings of the study, the following recommendations are given.

1. The *Integrated Provincial Health Office (IPHO) and City Health Office (CHO)* are encourage to strengthen its supervision and leadership with regards to safe vaccine administration. It is also recommended that an extensive trainings and seminars on vaccination will be done to increase the awareness of the nurses on the proper and safe vaccine administration.
2. The *Department of Health (DOH)* are encourage to strengthen its standard procedure and guidelines to expand the program on vaccination to ensure the safety of vaccine administration and avoid any harm to patients. Also, they are encouraged to strategically plan the vaccination process and administration in order to achieve Herd Immunity in the country.
3. The *IPHO and CHO nurses* may consider to continue professional education as only a few of the respondents were master's degree and doctorate degree holder. This will help them improve their knowledge and skills on their chosen field and provide the necessary skills to ensure a safe vaccine administration.
4. The *nursing students* are highly encouraged to put into mind and heart the knowledge and skills that they have and will be learning in school. This will help them become a good nurse that will provide quality service to patients. Further, they are encouraged to be informed and practice how to administer vaccines safely.
5. Lastly, the *future researchers* may consider to study the problems encountered by the IPHO and CHO nurses during vaccine administration. This will help them may necessary changes and actions that will avoid these problems in the future. The result of the problem may serve as a framework for future researches.

REFERENCES

1. Ajzen, I. (1991). The theory of planned behavior. Organ Behav Hum Decis Process, 50(2). 179–211. doi:10.1016/0749-5978(91)90020-T.
2. Ajzen, I. (1985). From intentions to actions: A theory of planned behaviour. In:Kuhn J, Beckman
3. J, eds. Action Control: from cognition to behaviour. New York:Springer Verlag.
4. Ali, N. (2002). Prediction of coronary heart disease preventive behaviors in women: a test

of the health belief model. Women Health, 35(1). 83–96.
5. Amanat, F. & Krammer, F. (2020). SARS-CoV-2 Vaccines: Status Report. Immunity 2020: 52(4).583–589.https://doi.org/10.1016 /j.immuni.2020 .03.007.
6. Conner, M. (2001). Health Behaviors in International Encyclopedia of the Social & Behavioral Sciences.
7. Czochor, J., & Turchick, A. (2014). Introduction. Vaccines. The Yale journal of biology and medicine, 87(4), 401–402.
8. Deb, B., Shah, H., & Goel, S. (2020). Current global vaccine and drug efforts against COVID-19: Pros and cons of bypassing animal trials. J Biosci 45. 82. https://doi.org/10. 1007/ s12038-020- 00053-2.
9. Diamla, M. (2017). Community Health Nurses' Awareness as Determinants to the Safe Administration in Vaccine on Selected Municipalities of Lanao del Sur.
10. Greenwood, B. (2014). The contribution of vaccination to global health: past, present and future. Philosophical transactions of the Royal Society of London. Series B, Biological sciences, 369(1645), 0130433.https://doi.org/ 10.1098/rstb.2013.0433
11. Kibler, J., Ma, M., Hrzich, J., & Roas, R. (2018). Public Knowledge of Cardiovascular Risk Numbers: Contextual Factors Affecting Knowledge and Health Behavior, and the Impact of Public Health Campaigns. Lifestyle in Heart Health and Disease.
12. LaPiere, R. (2010). Attitudes vs Actions. Int J Epidemiol, 39(1). 7-11. https://doi.org/10.10 93/ ije/dyp398.
13. Lurie, N., Saville, M., Hatchett, R., & Halton, J. (2020). Developing COVID-19 vaccines at pandemic speed. N Engl J Med, 382. 1969–1973.
14. Nigara Region, (2021). Retrieved from https://www.niagararegion.ca/health/professionals/vaccine/cold-chain-incident.aspx.
15. US Department of Health and Human Services. (2005). Theory at a glance: a guide for health promotion practice. Contract No.: 05-3896.
16. World Health Organization. (2020). WHO Coronavirus Disease (COVID-19) Dashboard. https://covid19.who.int/?gclid=EAIaIQobChMI2p622O-e6wIVxJrVCh0DJgDvEAAYASAAEgIeFfD.

APPENDIX A

Letter to the Municipal Health Office

Dear Sir/Madam,

Greetings of peace!

We, the Bachelor of Science in Nursing students from SMD Foundation Academy, Marawi City are conducting a study entitled "*Level of Awareness on Covid-19 Vaccine Administration Among Health Care Professionals as Determinants to Safe Vaccine Administration in the Integrated Provincial Health Office and City Health Office Marawi City*" in partial fulfilment of the requirements for the degree Bachelor of Science in Nursing.

In this connection, we would like to seek for your permission in allowing us to conduct a survey in selected Rural Health Units in Lanao del Sur for us to be able gather the data. We are hoping that this request will merit your consideration and approval.

We will greatly appreciate your approval and whatever form of assistance that you can extend regarding this matter.

Thank you and God bless!

Very truly yours,

Jashim M. Panolong
Sonairah M. Tacnarun
Researchers

Noted by: Mohammad Ryan L. Diamla, RN, RM, REB, MAN, Ph.D, h.c.
Thesis Adviser

Attested by: Rosanna L. Matuan, RN, MAN, MBA-HA, Ph.D., h.c.
Dean

APPENDIX B

Letter to the Respondents

Dear Respondents,

Greetings of peace!

We, the Bachelor of Science in Nursing students from SMD Foundation Academy, Marawi City are conducting a study entitled "*Level of Awareness on Covid-19 Vaccine Administration Among Health Care Professionals as Determinants to Safe Vaccine Administration in the Integrated Provincial Health Office and City Health Office Marawi City*" in partial fulfilment of the requirements for the degree Bachelor of Science in Nursing.

In this connection, we are privilege to have you as one of our respondents in this study. Please fill in the necessary information on the attached survey questionnaire. Rest assured that all your answers will be treated with utmost confidentiality. We are looking for your permission in this regard.

Your support and cooperation are highly appreciated.

Thank you and God bless!

Very truly yours,

Jashim M. Panolong
Sonairah M. Tacnarun

Researchers

Noted by: Mohammad Ryan L. Diamla, RN, RM, REB, MAN, Ph.D, h.c.
Thesis Adviser

Attested by: Rosanna L. Matuan, RN, MAN, MBA-HA, Ph.D, h.c.

APPENDIX C

Informed Consent Form

For Respondents participating in the research entitled: *Level of Awareness on Covid-19 Vaccine Administration Among Health Care Professionals as Determinants to Safe Vaccine Administration in the Integrated Provincial Health Office and City Health Office Marawi City.*

This informed consent form has two parts:

1. Information Sheet
2. Certificate of Consent

You will be given a copy of the full Inform Consent Form

Part 1: Information Sheet

You are being asked to take part in a research study. Before you decide to participate in this study, it is important that you understand why the research is being done and what if will involve. Please read the following information carefully. Please ask the researcher if there is anything that is not clear or if you need more information.

Purpose of Study

This paper reviews the patient's safety on the COVID-19 vaccines given in rural health units to cater the local residents of the selected areas in Lanao del Sur. It is also a concern of this study to assess the level of awareness of community health nurses in terms of safe vaccine administration and post-vaccination monitoring and surveillance for the purpose of maintaining quality and safe vaccine administration.

Study Procedures

The researchers will make use of the relevant records of studies and researches that are significant and related to the present study. The researchers will send a consent letter to the concerned offices and the researchers has to obtain informed consent to the participants prior to the conduct of the data gathering. Upon approving of the permit to conduct the study, questionnaires will be personally distributed by the researchers to the respondents. Then, the researchers will retrieve the questionnaire right after it will be completely answered.

Risks

The result of the study will be subjected for an intervention if there is to be improved in the knowledge and skills of the rural health workers in terms of vaccination to achieve quality care and safe vaccine administration in rural areas in Lanao del Sur. You may decline to answer any or all questions and you may terminate your involvement at any time if you choose.

Benefits

Community: The result of this study will be a good help in making the community understand of the importance and safeness of getting vaccinated. Moreover, it will help encourage the community to get vaccinated to protect their family from the COVID-19 and prevent its spread to others.

Patients: The study's findings will help patients understand the significance of COVID-19 vaccination in ensuring their safety. Furthermore, being informed of the vaccinators' expertise of safe COVID-19 vaccine administration may help reduce the number of patients refusing to be vaccinated.

Department of Health: The study's findings will be useful to the Department of Health in identifying potential issues that nurses and patients may face when administering the COVID-19 vaccine. It would also assist the department in providing quality services to ensure the safety of the patients.

Lanao Del Sur Rural Health Units: The findings of this study will aid in the implementation of proper practices for administering COVID-19 vaccines in Lanao del Sur's rural health units. It will also provide assistance to programs that may be required to improve community health workers' knowledge and awareness of the COVID-19 vaccination.

Healthcare Workers: The findings of this study will be useful in assessing healthcare workers' expertise of safe COVID-19 vaccine administration. Furthermore, it will assist in correcting and improving their skills in order to avoid mistakes when administering vaccinations in their area of assignment.

SMDFA: The result of this study will be useful to the institution as it will help them integrate this to the curriculum of the programs they offer.

Future Researchers: This study could be used as a reference for future researchers who are conducting a similar or related study.

Confidentiality

Your responses to this research structured survey questionnaire will be anonymous. Please do not write any identifying information on your survey questionnaire or for the purposes of this research study. Every effort will be made by the researchers to preserve your confidentiality. Participant data will be kept confidential except in cases where the researchers is legally obligated to report specific incidents. These incidents include, but may not be limited to, incidents of abuse and suicide risk.

Part 2: Certificate of Consent

Voluntary Participation
Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researchers. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

Consent

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature: _____
Date: _____

Researcher's signature: _____
Date: _____

APPENDIX D

Survey Questionnaire

Level of Awareness on Covid-19 Vaccine Administration Among Health Care Professionals as Determinants to Safe Vaccine Administration in the Integrated Provincial Health Office and City Health Office Marawi City

Part I: Respondent's Profile

Direction: Please fill in the blanks or check the box () to answer each question. Rest assured that your answers will be kept confidential and will serve only for research purposes. Please do not leave any questions unanswered.

Name (Optional):
_____

Sex: ( ) Male ( ) Female

Highest Educational Attainment:

( ) College Degree ( ) Master's Degree ( ) Doctorate Degree

Others (please specify): _____

Years in Service:

( ) 6 months – 1 year
( ) 1 year and 1 month – 2 years
( ) 2 years and 1 month – 3 years
( ) 3 years and 1 month – 4 years
( ) 4 years and 1 month – above

Number of Trainings and Seminars Attended (For Immunization): _____

Part II: Community Health Nurses' awareness on the safe COVID-19 vaccine administration

Direction: The following statements are designed to evaluate the patient's safety as done by the respondents. Please put a check mark (✓) on the appropriate column indicating your answer using the legend below:

3 – *Agree:* The respondent is 100% sure about the questions being asked.
2 – *Undecided:* The respondent is 50% sure about the questions being asked.
1 – *Disagree:* The respondent is 0% sure about the questions being asked.

A. Vaccines

Statement Indicators	3	2	1
1. Vaccination is safe and effective.			
2. All vaccines undergo rigid trials by doctors, scientists and government to ensure its safety.			
3. The vaccine-preventable disease such as COVID-19 remains a threat, thus it is better to be protected.			
4. Vaccination protects both children and adults from serious illness and complication of COVID-19.			
5. Vaccination prevents the outbreak of COVID-19.			
6. Vaccines are among the most effective public health and medical strategies for protecting and preserving health.			

B. Potency

Statement Indicators	3	2	1
1. The effect of vaccines coming from the main office is the same with what is supplied in the rural health units.			
2. The potency of medicines distributed in rural health units is in its efficiency to cure.			
3. Vaccines are prepared safely.			
4. Unopened vaccine vials are returned to refrigerator.			
5. Check freeze indicator (if freezing warning appears, perform shake test).			
6. Proper handling and storage of vaccines can affect the potency of medications.			
7. Proper temperature monitoring can affect vaccines' potency.			
8. Discard vaccines when it color change, its characteristics change into cloudy and bubbly.			

C. Temperature

Statement Indicators	3	2	1
1. COVID-19 vaccines require refrigeration with temperature ranges of +2°C to +8°C, -15°C to -24°C and to as low as -70°C to -80°C.			
2. The potency of the majority of the vaccines can be affected adversely by storage temperatures that are too warm, these effects are usually more gradual, predictable, and smaller in magnitude than losses from temperature that are too cold.			
3. Store vaccines at ideal temperatures.			
4. Use insulated containers with packing material and a digital temperature monitoring device to store vaccine if a refrigerator is not available during immunization clinics.			
5. Minimize the number of times that the insulated container is opened during immunization clinics.			
6. Visually inspect the digital temperature monitoring device each time the insulated container is opened.			
7. Monitor and record the temperature readings in the insulated container before, on and upon finishing the vaccine session.			

D. Storage

Statement Indicators	3	2	1
1. COVID-19 vaccine storage units must be selected carefully and used properly.			
2. Any refrigerator/freezer used for vaccine storage must maintain the required temperature range all throughout the vaccination period.			
3. Place the vaccines in trays or uncovered containers for proper air flow.			
4. Keep vaccines in original boxes with lids closed to prevent exposure to light.			
5. Put vaccines that are first to expire in front.			
6. Don't put vaccines in doors or on the floor of the refrigerator/freezer.			
7. The vaccine carrier prepared and lid should be closed tightly.			

E. Sustainability of Electric Power

Statement Indicators	3	2	1
1. The proper temperature monitoring is a key to proper cold chain management and it includes electricity.			
2. When a problem is discovered, the exposed vaccine is maintained at proper temperature while state or local health departments, or the vaccine manufacturers are contacted for guidance.			
3. The written emergency retrieval and storage procedures are in place in case of equipment failures or power outages.			
4. The power interruptions may alter the temperature of the refrigerator; thus it may alter the potency of vaccines.			
5. The electric power has a major role in the maintenance of standard temperature for vaccine storage.			
6. Do not open the refrigerator right after the electric interruptions (1-2 hours)			
7. The facility must have generator as alternative to the source of electric power during electrical interruptions.			
8. The facility has measures and alternatives in time of electric power interruptions.			
9. 12 hours of electric interruptions may alter the effectiveness and potency of the vaccines.			
10. If we have vaccines wastage due to electric power interruptions, we will make an incident report about the said wastage.			

F. Vaccine Transport / Distance Travelled

Statement Indicators	3	2	1
1. Transport all vaccines in an insulated container supplied by the DOH with appropriate packing configuration.			
2. The insulated containers are internally validated to ensure that they are capable of maintaining the vaccine at the required temperatures for the required duration for transportation and/or storage.			
3. There is documentation that shows that the insulated containers have been internally validated. This documentation may be provided from the manufacturer or produced from the board of health's testing.			
4. Ensure that all insulated containers storing vaccines have digital temperature monitoring device.			

5. Clearly mark all insulated containers storing vaccines in a visible location with the following label: "VACCINES – REFRIGERATE IMMEDIATELY." Before placing vaccines into the refrigerator, they must be removed from the insulated containers.			
6. Do not transport vaccines in insulated containers in the trunk of a car due to the risk of exposure to extreme temperatures.			
7. The distance travelled by the health workers to deliver the vaccines do not affect the potency of the vaccines.			
8. The distance travelled has nothing to do with the effectiveness of the vaccines.			
9. The distance travelled and hours of travel do not affect the potency and effects of the vaccines as long as the storage practices are appropriate and maintained by the health workers.			
10. Check the condition of vaccines upon receiving it, especially when it is from a long-distance travel.			

G. Dosage

Statement Indicators	3	2	1
1. The distribution of COVID-19 vaccines is according to dosage.			
2. There is corresponding dosage for adults and children.			
3. All individuals are required to have 2 doses of COVID-19 vaccines.			

H. Preparations

Statement Indicators	3	2	1
1. The healthcare workers or vaccinator wash hands with soap.			
2. The care taker instructed the client about the procedure to lessen anxiety and encourage cooperation.			
3. In vaccine segregation we determined which vaccines have previously been received.			
4. The vaccines' contraindications checked.			
5. The vaccines should be prepared safely.			
6. The required quantities of vaccine vials taken out of the refrigerator shall be in specific order.			
7. The diluents taken out and matched with the appropriate vaccines.			
8. Checked if vaccines are safe to use (label, expiration date, vaccine vial monitor)			
9. The equipment for the vaccination should be collected and prepared (auto-disabled syringes, register, cards, tally sheets)			

I. Route and Site

Statement Indicators	3	2	1
1. Intramuscular (IM) injection is the recommended route for COVID-19 vaccines.			

Part III: Community Health Nurses' awareness in Post-Vaccination Monitoring and Surveillance

Statement Indicators	3	2	1
1. The patient shall be observed for one (1) hour after the vaccination.			
2. Vital signs should be monitored every fifteen (15) minutes.			
3. Use post-vaccination checklist to monitor the patient			
4. Respond and give first aid to patient with Adverse Events Following Immunization (AEFI)			

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