Original Research Article

AWARENESS AND KNOWLEDGE LEVEL OF PUERPERAL MOTHERS ON NEONATAL JAUNDICE:A QUALITATIVE STUDY IN NORTHERN GHANA

ABSTRACT

Background: Neonatal Jaundice is a major contributing cause of newborns hospitalizations, and a major cause of newborns mortality. Inadequate knowledge of mothers about NNJ result in delayed decision making to seek timely medical interventions.

Methods: Using an exploratory design, a semi-structured interview guide was used to assess puerperal mothers' knowledge on NNJ. A purposive sampling technique was used to select 15 mothers attending health services at the Tamale West Hospital with newborns sick of NNJ. An interview guide through in-depth interview process was used to gather data. Interviews were recorded and transcribed before analyzing thematically to organize the data into major and sub-themes.

Results: Awareness of NNJ was above average, majority of mothers had knowledge of NNJ. Reported signs and symptoms of NNJ include yellowish eyes, palm, and skin. Treatment of jaundice was cited to include the use of phototherapy, and frequent breastfeeding. Causes and risk factors associated were; infections, G6PD defects, and consumption of herbal concoctions.

Conclusions:Health education should be intensified at the various units of the hospital to correct cultural and religious practices and improve caregivers and mothers understanding about NNJ.

Key Words:***Neonate, Jaundice, Puerperal, Knowledge, Awareness***

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INTRODUCTION

Globally, Neonatal Jaundice (NNJ) occurs in 60% of full-term babies and 80% in preterm babies usually within the first of life (Shehu, Shehu &Ubanyi, 2020). In each year, globally, about 1.1 million babies worldwide develop severe hyperbilirubinemia. An increased number of these cases of NNJ occurred in Sub-Saharan Africa and South Asia (Farouk et al., 2021). NNJ involves the yellowish discolorations of the sclera and skin in a newborn, which result from increased bilirubin in the blood. Bilirubin is produced from heme, and in neonates there is increased production of bilirubin than adult because of polycythaemia and increased red blood cell turnover (Soltaninejad&Dehdashti, 2020).

In sub-Saharan Africa (SSA), newborns are at much increased risks of NNJ due to the relative adverse effects of neonatal hyperbilirubinemia (Al-Zamili& Saadoon, 2020). NNJ is a major contributing cause of newborns hospitalizations, therefore among the leading causes of newborns deaths. Signs of NNJ in progresses in the cephalocandal direction, resulting from the increased blood level of bilirubin (Iliyasu et al., 2020).The increased in bilirubin levels leading to newborns NNJ is due to the excess hemoglobin breakdown. High haemoglobin levels at birth and the reduced lifespan of newborn red blood cells (70–80 days) and hepatic metabolism of bilirubin results in immature hepatocytes (Boadi-Kusi et al., 2021). Aside these, other maternal and neonatal risk factors such as preeclampsia, Glucose-6-phosphate dehydrogenase (G6PD) deficiency, ABO blood group incompatibility, prematurity, birth weight, intrauterine growth retardation, metabolic abnormalities, neonatal sex, birth weight, and nutrition were equally identified as risk factors for NNJ (Abdul-Mumin et al., 2021; Iliyasu et al., 2020; Shehu, Shehu &Ubanyi, 2020).

NNJ complications include cerebral palsy, bilirubin encephalopathy, and in the worse state death of the newborn (Demis et al., 2021). Interventions toward preventing NNJ were referred to include phototherapy and appropriate exchange of blood transfusion, which were identified as key interventions to the prevention of kernicterus and reduced sickness and deaths among newborns (Ullah et al., 2020). Early prevention of NNJ is important in the first week of life (Al-Zamili& Saadoon, 2020). Denis et al (2021) assert that, puerperal mothers' knowledge and understanding the risk factors of NNJ help reduce the morbidity and mortality of NNJ among newborns. Abdul-Mumin et al (2021) reported that, inadequate information or lack of knowledge about NNJ

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may contribute to delayed decision making and obtaining medical service for the treatment of NNJ. Furthermore, knowledge and awareness of NNJ, screening and treatment process would help mothers to seek early start of phototherapy and treatment of NNJ. It will as well as help to avoid problems associated with NNJ and the progression of the conditions to severe state. In Ghana, there are limited literature on puerperal mothers' knowledge and awareness of NNJ. The few literatures identified, reported low knowledge of puerperal mothers regarding the causes of NNJ, however awareness level was reported high among puerperal mothers. Conducting a study to measure puerperal mothers' knowledge and understanding of NNJ would help to identify the gaps and target areas for intervention which would help to prevent chronic morbidity and mortality of neonates (Soltaninejad&Dehdashti, 2020).

METHODS

Study Design

This was a qualitative study with a descriptive exploratory design to assessing the knowledge of puerperal mothers on NNJ. This design would enable the researchers to explore the subjective realities about the phenomenon under investigation in order to gather rich and enough data on the study topic (Mayan, 2009). The design would allow the researchers to explore the experiences of puerperal mothers with NNJ. This study adopted a descriptive narrative method using qualitative technique to analyze data from puerperal mothers attending health service at the Tamale West Hospital as an intrinsic case. This method of study allowed the researcher to take into account the natural contexts of the participants and is aimed to provide an in-depth understanding of the situation under study (Polit & Beck, 2016).

Study Setting

The study was conducted at the Tamale West Hospital in the Tamale Metropolis, Northern Region of Ghana. The Tamale West Hospital was opened on April, 1998 as a polyclinic. It was upgraded to the status of a district hospital in the same year. It is currently a referral hospital for the Tamale Metro sub-district health centers. The units under study are Obstetrics and Gynaecology, and newborn care unit.

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Study Population

Munhall (2012), describe study population also known as the accessible population, that is derived from a target population to conduct a study. The study population in this study covered all puerperal mothers or postnatal mothers attending health services at the Tamale West Hospital who have babies from birth up to 6 weeks.

Target Population

The target population is a particular group of people the researcher is interested to study about (Munhall 2012). The target population covered all puerperal mothers at the Neonatal Intensive Care Unit who have newborns who are within the first 28 days of life, and were sick of NNJ. In qualitative studies, unique experiences or views of the participants on the particular subject under investigation is a key determinant in participant selection (Munhall, 2012). Therefore, the expected total number of puerperal mothers with neonates' sick of jaundice was estimated at 15 puerperal mothers.

Inclusion Criteria

Mothers with a newborn diagnosed of NNJ who visited Tamale West Hospital for at least three (3) months. The essence was to ensure that, the participants included in the study would serve as key informants, and would have rich information to provide regarding their experiences of knowledge on NNJ.

Exclusion Criteria

Puerperal mothers whose neonates were not sick of NNJ were excluded since they might lack information on the subject matter as well as mothers with neonates diagnosed of NNJ who have life threatening medical conditions.

Sample size determination

A qualitative study according to Polit & Beck, (2016) do not require a defined sample size to be determined using a mathematical method but should usually be based on the views point of the researchers and the study topic of interest to reaching an adequate number of participants for the study. Creswell, (2014), the sample size should not be mathematically determined but should be large enough to sufficiently describe the phenomenon of interest, and address the research questions since the goal of every qualitative study is to have enough sample size to uncover a variety of opinions and experiences on the subject matter, and should be limited at the point of saturation.

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Point of saturation according to Marshall et al., (2013), is the point where the collection of new data/information is no longer changing or changes a little in the responses of the study participants to the objectives of the study. Point of saturation can also be described as the point at which the researcher uses to determine when there is adequate data from the study to develop a robust and valid understanding of the study phenomenon. Therefore, the sample size for this study would include 15 puerperal mothers with newborns sick of NNJ at the Tamale West Hospital, and would be administered with the interview guide to examine their views and opinions based on their experience of knowledge on NNJ.

Sampling Technique

The study employed a non-probability sampling technique to select the 15 puerperal mothers for the in-depth interviews. Purposive sampling method technique was employed to select the puerperal mothers based on their experience of knowledge on NNJ at the Tamale West Hospital. Data saturation was achieved by the time the fifteen (15) puerperal mothers were all interviewed. The puerperal mothers were recruited from the Neonatal Intensive Care Unit and the postnatal care clinic, and mothers with neonates' sick of NNJ on admission at the Tamale West Hospital or treated and discharged home.

Data Collection Instrument

Data collection tool for the study involved the use of a Key Informant Interview (KII) guide through an in-depth interview process. Each participating puerperal mother served as a Key Informant, and was administered with the Interview guide. The interview guide was administered by the researchers themselves to the study participants. The interview guide was constructed by the researchers themselves using existing literatures, and reviewed and refined by the academic supervisor to make the instruments valid and reliable for the data collection. The technique of data collection involved a semi-structured in-depth interview process, and was conducted by the researchers from 11th August 22 to 10 September.2022

The designed interview guide consisted of five (5) parts based on the study objectives. The first part of the instrument contains information on participants' demographic

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characteristic such as age, religion, education, occupation, marital status and among others. The second part of the instrument looks at puerperal mothers' awareness of NNJ, and knowledge gained on experience with NNJ. The third part of the instrument looks at the risk factors and causes of NNJ. The fourth part of the instrument covered the strategies and ways of minimizing the occurrence of NNJ among newborns of puerperal mothers at the Tamale West Hospital and the firth part talks about supportive care and services puerperal mothers with baby's suffering from NNJ receive from family and Hospital staff The interview guide contains open-ended questions, and interviews were conducted in English, and the local language (Dagbani) among puerperal mothers. All the interviews were audio-recorded with the permission of the participants using a tape recorder.

Pilot study

To ensure validity, reliability and trustworthiness of the study results, the study was piloted at the Tamale Central Hospital with two (2) puerperal mothers and the instrument pretested to help refined and modified the instrument to suit the study aims. During the pretesting interviews, any inaccurate wording of questions was restructured and corrected to help the researchers elicit the right responses from the study participants. The pretesting enables the researchers to properly align all questions, and rearranged all questions orderly based on the objectives to enable the study participants respond correctly to each question in the interview guide.

Validity and Reliability/Methodological Rigor

Methodological rigor according to Thomas and Magilvy, (2011), in qualitative study is a way the researchers seek to establish trust or confidence in the findings of a research study. It allows the researchers to establish consistency in the methods used over time and provides an accurate representation of the population studied. Methodological rigor involves Four-Dimensions Criteria in nursing as described by Morse, (2015) to help established trustworthiness, and include; credibility, dependability, conformability and transferability.

Credibility: this was to establish confidence that the results from the experiences of mothers were true, credible and believable. Credibility was ensured as the interview

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guide was pretested, and each interview section lasted for an average time of about 25-30 minutes with each participant to help explore their views and opinions based on their knowledge and experience of neonatal jaundice. Furthermore, credibility was ensured by ensuring the investigators had the required knowledge and research skills to transcribed the recorded responses of participants verbatim and translated in order to maintain the meaning of the participants narrations based on the administered interview guides, field notes and recordings that were done in the field, and the supervisor did cross checking with the recorded data and transcriptions to ensure all details about the study were clearly explained to participants to have an exhaustive findings of the study.

Dependability: According to Schou et al., (2012), dependability in qualitative research ensures the findings of the study inquiry are repeatable if the inquiry occurred within the same target population, coders and setting. Dependability actually ensures the stability of the study data over time and over condition. In this study to ensure the dependability of the study over time, a detailed study protocol was prepared and reviewed several times by academic supervisor, and all corrections suggested by the academic supervisor were effected and re-submitted to the academic supervisor for cross-checking and validation of the corrected comments and suggestions. Again the researchers ensured the dependability of the results by selecting participants in the field who were puerperal mothers with babies' sick of neonatal jaundice and the interview process was tracked and detailed recordings of the data collection process was done to ensure the interviews process was successful. The researchers also ensured accuracy in transcriptions, coding and inter-coders reliability of the research team by cross-checking the transcriptions with the recordings to produce valid transcriptions and recordings.

Conformability: Morse, (2015) refers to conformability as the extent of confidence that the results would be authenticated or validated by other researchers. To achieve conformability of the research results, the researchers applied several triangulation techniques in term of methodology, data source, investigators and theoretical approaches to diagnose the research problems based on the research questions from the findings of the study.

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Transferability: Thomas and Magilvy, (2011) stated that, transferability is the immensity to which the research results can be generalized or transferred to other contexts or settings. Transferability describes the magnitude to which the results of the study can be transferred to other settings. Transferability was ensured by thorough, rigorous descriptions of the research designs, the use of non-probability sampling method, with a combination of three purposive sampling techniques from hospital unit level to the study participants. Again, transferability was ensured by the researchers through an in-depth description of the research setting, and as well as quantifying the operational and theoretical data saturation to achieve wider views and opinions on the study. Finally, the researchers ensured transferability by asking themselves questions such as if the research will necessarily be applicable to other settings and if the same findings will reflect in similar study if conducted in the same settings.

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Data collection procedure

Data was collected through individual face-to-face interviews with puerperal mothers at the NICU and postnatal clinic in the Tamale West Hospital. This method of sampling in qualitative study was supported by Cohen, Manion and Morrison (2017), and has explained that in purposive sampling, a researcher can handpick participants to include them in the study on the basis of the researchers' judgment or possession of the particular characteristics being sought. The involvement in the study interview process was based on the individual voluntary involvement, and no participant was coerced to take part in the study. The in-depth interview sections with puerperal mothers were audio-recorded with a tape recorder, and through the permission of the study participants, and after recording, the findings of the recordings were kept safe and later transcribed for the study report, and are only destroyed after three (3) years.

Data Analysis

This process involves the collection of data and transforming it into meaningful information, for the conclusion and decision making by researchers. After the interviews, all interview recordings were first transcribed and analyzed manually through thematic analysis (TA). The objective of adopting the manual thematic

analysis was help to identify the patterns or similar subjects from the interview process (Sekaran & Bougie, 2010). The thematic pattern of analysis was done by transcribing the audio recordings and alongside the written notes of the responses of the interview with the puerperal mothers with newborns sick of NNJ.

The transcribed results were then organized into various themes (major and sub-themes). This process thus involved the researchers reading through the transcriptions and jointly generating a list of recurring codes. Afterwards, coding was done by assigning a code, number or symbol to the data. The transcribed data was then analyzed using a six-phase approach to thematic analysis as proposed by Sekaran & Bougie, (2010). The six-phase approaches of the thematic analysis procedure include: (1) researchers familiarizing themselves with the data, (2) generating initial codes (3) searching for themes (4) reviewing themes (5) defining and naming themes, and (6) producing the report.

The first phase involved the researchers reading through the raw data of the interview recorded on tape and the field notes from the participants. The researchers read through the material several times to understand and become familiar with the critical concepts found in the data collected. Then the participants' ideas were then outlined verbatim as they expressed it and took notes of them by highlighting the main point that are then traced back and putting them in direct quotations for a careful transcription.

In the second phase, a data-led approach was used, and this involves the generation of codes to guide the analysis of the data. The researchers then scrutinize the data to identify codes that described the contents of a line or even a paragraph. The researchers then code the chunks of data by using highlighters and inserted comments in the text to identify sections of the data. The researchers after coding all the transcribed data, then matches the data extracted to demonstrate a particular code and added new codes where necessary.

The third phase of the thematic analysis entails searching for themes from the previously determined codes from the data. In this process, the researchers then organized the various codes into possible themes. This was done by looking for patterns in the coding and categorized them into undefined themes.

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The fourth phase involved the researchers reviewing the undefined themes, and then re-read the entire data set to certify whether all the themes are really themes or not and whether other themes needed further break down into different themes. The researchers reviewed and examined the themes concerning the data to see whether they appeared in a consistent pattern. Some themes are then abandoned during this process; some were modified while others were subdivided for more themes to be generated.

The fifth stage involves defining and labeling themes and organizing them into consistent descriptions. At this point, the researcher then identified some sub-themes that they defined and labelled in each theme which were then tailored into the broader research objectives. The final stage of thematic analysis involved report writing. Here, the researcher made available all the descriptions and explanations of the themes in the form of a study report.

Data Management

Sekaran & Bougie (2010) cited Data management as the process of obtaining, storing and using data safely, efficiently and cost effectively, in this study data was collected using the interview guide and process for the analysis. In-depth interview was conducted and recordings were than using a tape recorder, and field notes were taking alongside. After the field data collection, the recordings were transcribed alongside with the field notes. Data were process by first transcribing data which was recorded using the tape recorder alongside with the field notes to ensure that what was recorded were actually what has been transcribed to avoid variation in the recordings and the transcriptions. After that, the transcriptions were read several times alongside with the recordings and field notes to there is no different in the data. After ensuring that, the data was cleaned, the transcribed data was then used in the data analysis. Before the analysis, a highlighter was used to highlight and identified major and sub-themes of the transcribed data to aid in the analysis process.

Ethical Considerations

Ethical approval for the study was obtained from the Committee on Human Research and Publication Ethics (CHRPE) of the Kwame Nkrumah University of Science and

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Technology (KNUST), Kumasi with Ref: CHRPE/ AP/ 459/ 22 before the study. Written permission was secured from University for Development Studies to Regional Health Directorate, approved by the Regional Director, Ghana Health Service. Again, a formal permission was obtained from the Administrator and the Medical Director of the Tamale West Hospital before the commencement of the study in the study area. The study equally obtained verbal informed consent/permission from study participants, and individual participation in the study was by voluntary involvement of all participants while ensuring privacy, confidentiality and anonymity of all participants. Study participants were made aware of their liberty to withdraw from the study at any time or choose not to answer any question they might deem uncomfortable. Study participants were further assured that information provided was used only for academic purposes and not disclosed to any third party apart from the study supervisor and the research team. Risks and benefits of the study were equally explained to participants before their voluntary participation in the study.

Informed consent

Informed consent forms were explained by the researchers and understood by each participant before being enrolled by signing to confirm approval, and further recruitment into the study.

Privacy and confidentiality

All the information collected from the study participants was well kept on a password-protected personal computer of the investigator and not shared with non-study team members or used for any other purpose except this academic work. The names of the participants are not recorded on the interview guides to ensure anonymity.

Risks

Participants were informed that there was minimal risk for participating in the study, thus, their time and energy and no direct harm to them.

Benefits

Participants were informed that there was no direct benefit for taking part in the study, however, findings from the study based on the information they provided would be used for policy formulation to address the knowledge gaps of puerperal mothers on

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NNJ, the risk factors associated with NNJ, and ways of reducing NNJ among puerperal mothers.

Voluntariness

Participants were informed that their participation in the study was strictly voluntary. If an individual chooses not to participate, it did not in any way affect his or her hospital care services. Participants were informed of their right to withdraw from the study at any point after their initial acceptance to participate in the study or skip any questions they do not feel comfortable answering, and it would not affect the study findings. However, participants were made to understand that, after withdrawal from the study their views and opinions would still be used in the analysis.

RESULTS

Two themes emerged from content analysis of the data. They were Effect of time interval spent before seeing a doctor on child health, Awareness and knowledge of puerperal mothers about NNJ. The themes are presented and verbatim quotations used to back the claims.

Table 1: Respondents Socio-demographic Characteristics

Variables	**Frequency (N = 15)**	**Percentage (%)**
Age of respondent (Mean age = 29 years)		
21-25 years	4	26.7
26-30 years	5	33.3
31-35 years	2	13.3
36 years, and above	4	26.7
Educational background		
Secondary	8	53.3
Tertiary	7	46.7

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Marital status		
Married	13	86.6
Single	1	6.7
Cohabiting	1	6.7
Religion		
Christians	8	53.3
Muslims	7	46.7
Occupation		
Self-employed	7	46.7
Government worker	5	33.3
Housewife	3	20.0
Residential status		
Rural	2	13.3
Peri-urban	5	33.3
Urban	8	53.3
Parity/number of children		
1 child	6	40.0
2 children	3	20.0
3 children	4	26.7
4 children	2	13.3
Time covered to health facility (Average time = 32mins, 1second)		
Less than 30mins	8	53.3
30-45mins	5	33.3

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1 hour	2	13.3
Time taken before seeing a doctor (45mins, 4second)		
10-20mins	3	20.0
30mins	4	26.7
1 hour, and more	8	53.3

Source: Field Data, 2022

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Effect of time interval spent before seeing a doctor on child health

Time interval spent before seeing a doctor do not affect my child health

From the fifteen puerperal mothers interviewed nine (9) out of 15 of the mothers said time interval spent before seeing a doctor does not affect their child health in any way. In view of the fact that, they their child was already sick, and hence time interval before seeing a doctor is of less effect.

"*Aww, not really because I came to the hospital with my child already sick and I don't think it's really has effect on my child because sometimes they are busy when you are arrived, and that might delay a little which doesn't cause harm" (P1).*

"*mmm not really, it has not affected my child's condition in any bad way because you'll first go for your folder then they will check your baby's temperature and weight and then you go and see the doctor, and so I don't think it has affected my baby" (P2).*

"oooo, not really because as for West hospital they are very fast in their services as compared to other facilities in town, you don't waste much time to see a doctor or a nurse. Sometimes are the records that you delay small for your folder" (P6)

"No.....oooooo, I don't think the time spent before seeing a doctor has affected my child because, she is already sick, and so the doctor is only coming to help save my child" (P1).

"……………Oohk, no I don't think so, the doctors have a lot of work to do and that is why they are late, I know if he has nothing to do, he will come early, and so I am okay" (P13).

Some participants were of the view that, doctors and nurses report to work early, especially at the Neonatal Intensive Care Unit, and attend promptly to their babies on time, and so the little delayed in time before seeing a doctor does not affect the health of their babies. Some indicated that the time interval spent before seeing a doctor is to enable them undertake some processes of the hospital such as picking their folders which is necessary to enable the doctor attend to them well.

"As or me, my baby was brought here (NICU) immediately after I delivered because he (baby) couldn't breathe well and for here (NICU), the doctor normally come very early to attend to us" (P14).

"………………., I don't think the time spent can affected my baby because when you come to hospital you need to pass through some processes by taking your folder before seeing a doctor so it doesn't affect my baby condition" (P13).

"My dear, no it has not affected me, because, I have to take my child folder before a doctor can see me and my child, and so the time spent was to help me get folder for my child before can than see a doctor" (P2).

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Time interval spent before seeing a doctor has worsened my child health

However, six (6) out of 15 puerperal mothers said the time interval spent before seeing a doctor has contributed to worsening their child's conditions. Because, they believed that, their children conditions needed immediate attention, but when the doctors delayed before attending to them has aggravated the child's conditions, and worsen the health state of the child.

" ………oh yes, I think so because if they (doctors) delay too much the baby's condition can get worsen, my child sickness needs immediate attention but at the hospital they (doctors) delayed attending to us, and it has worsened my child's condition" (P3).

"Yes yesyes, I think so because as I said earlier I'm a victim of the wrong time I came here around 10 O'clock in the night and they detected that my child had jaundice but the NICU was full, and so they (doctors) could not admit my baby, and said I should wait for them to get an empty bed for us (Myself and baby), and that has contributed to the state of my child condition now, if they (doctors) had admitted us early, my child condition could have not been worsened like this" (P5).

"Yes, because sometimes when your child is sick, it means he is not well right, and so then if you (mother) have to wait long before you can get a doctor to attend to your child, it can worsen the baby's condition, and it does affect my child condition" (P3).

"of course…………, because when the child is sick, it means he is not well right, and so then if you (mother) have to wait long before you can get a doctor to attend to your child, it can worsen the baby's condition, and it does affect my child's condition" (P15).

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Awareness and knowledge of puerperal mothers about NNJ

Awareness of NNJ

Awareness of NNJ was almost universal among participants. Majority of participants (14 out of 15) said they have heard about NNJ. Sources participants mentioned to have heard about NNJ includes; internet, during antenatal care clinic health talk and education by nurses and midwives, through reading of books, television, and from friends. 10 out 15 said they heard about NNJ through the nurses at the hospital during antenatal care, after they put to birth and during admission at NICU

"Yes, I actually heard about NNJ after I delivered at the hospital and nurses told me about, and said if I go home I should bring the baby out every morning and observe the eyes, and if I see any changes that I reported back to them" (P1).

"mmmm, I heard about it during antenatal care clinic, and when I delivered my child and was discharged home the nurse educated us that when I get home and I see a sign of jaundice like yellow eyes and body of my baby been yellow I should rush to the hospital" (P3).

"……….actually…… my baby was not fully term (preterm) and I delivered so she was brought here straight from the labour ward and we have being here for4 days now, so it was yesterday morning I was informed my baby is developing jaundice by the nurses"(P4)

Other participants also gave similar responses as follows;

"I heard about it from the antenatal care clinic that it is a yellowish colour of your baby's eyes when you don't breastfeed well and so they advised us to bring our babies out in the morning to check the eyes and body if it has changed colour to yellow and if the colour is yellow you should come to the hospital with the child" (P8).

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"Yes, I heard about NNJ after delivery at the hospital when I was going home the Nurses talked to me about it, and that the baby eyes will becomes yellow ………………..." (P15).

However few people mentioned they learnt about NNJ from internet, television, books, family and friends

"I read about it from the internet, last year my senior sister's baby suffered from NNJ so it made me curious to know more about it. Actually, they have two children and they all had jaundice when they were babies" (P6).

"I heard it all on the television. They were doing a programme about it on one of the television channels that it affects babies and if not treated well can lead to disabilities in the future, they even interviewed one woman who said her child have autism because of jaundice during her childhood"(P7)

"Yeah, it was my friends who told me about it, her daughter had the jaundice and was treated, and so I heard about it through my friend" (P10).

Knowledge of NNJ

Definition of NNJ

From the study, participants (13 out of 15) have some form of understanding about NNJ. Approximately all participants (14 out of 15) defined NNJ to means the yellowish appearance of the baby's eyes as well as passing yellowish urine and stool, and palm and feet equally been yellow, and the body or skin equally appear yellow due to excess bilirubin level in the baby's blood. A few of the participants said NNJ mostly occurred in babies from the third day after delivery.

"………, what I know about NNJ is that……., after giving birth to your child, when you realize the eyes have become yellowish or when the baby passes a yellowish urine or passes yellowish stool, it means the child has developed NNJ" (P1).

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"I learnt that is a disease which affects babies and make the baby's eyes change from white to yellow as well as the skin………….. I equally learnt that is the yellowish discoloration of the baby's eyes and skin as a result of not breastfeeding the baby early after delivery" (P3).

*"I know that jaundice come about when there is excess bilirubin level in a baby's blood which …………. or when there is an underlying disease condition. The eyes and the skin will become yellow*ish*" (P15).*

Notwithstanding, few of the mothers understood NNJ as; when a baby have fever, and the by-product of that is the yellowish of eyes of the baby, feeling weakness and unable to feed on the breast.

"Yeah, they (nurses) said NNJ is when your baby eyes become yellow but what I know is that………….., when you have fever or when a baby have fever that you see the yellow colour on the eyes" (P15).

On the other hand, other mothers understood NNJ to mean the increasing body temperature of the baby, and been weak alongside having difficulties breastfeeding, and the eyes colour turning yellowish, and skin too look yellow.

"Yeah, what I know NNJ to mean is that, there is rising body temperature and the child look very weak, and you can see that the baby eyes are turning yellowish" (P5).

Knowledge of mothers on signs and symptoms of NNJ

Generally, common signs and symptoms of NNJ reported among all participants were cited to include; yellow palm and soles of the feet, yellowish eyes, yellow urine and stool, dry yellowish skin with spotted spots that feels very dry when touched or pressed and the body equally changes from pinkish to yellowish.

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"Yeah, the babies will have yellow eyes, yellow body and the child will not be breastfeeding well and the child can also become weak……………………., the body changes colour and sometimes have spotted spots and when touch or pressed, feels dry" (P6).

"……………. for me, the baby will have yellow eyes and their body sometimes become yellow especially around the ears and the bridge of the nose and the palms. It was yesterday night I saw that my baby's eyes was yellow and I confirmed it this morning ………………………………….. (P10)

Minority of the mothers understood the signs and symptoms of NNJ to mean when the child body becomes hot or increased facial bodily temperature, and alongside bodily weakness of the baby.

"Ooohk, if a child has NNJ you can observe that the body will become hot, and you can see it from the face, the baby is weak, and I realize the eyes was becoming yellowish" (P15).

Common signs and symptoms of NNJ presented by babies indicate danger, and which prompted the mother to send the baby to the hospital were cited to include; yellow eyes, back of the ears been yellow, rising body temperature and sometimes the whole body becomes yellow.

"What I saw in my child was that, he stopped breastfeeding, but at first when you take the breast from his mouth, he will be crying, but that day the baby didn't want to feed again and my baby's breathing was changing, and the eyes were yellow…………..the baby's eyes were not white on the third day then the skin colour was changing as well, it wasn't pink like when the baby was born" (P5).

"For me, I saw it first during the one-week outdooring, because when I was going home I was educated by the nurses to observe it every morning and report back when

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I see any changes, and for me the rising body temperature got me worried to bring the baby to the hospital" (P15).

With the incidence of who first discovered the signs and symptoms in the baby, mothers (9 out of 15) were able to identified the signs and symptoms of NNJ themselves, and then prompted either the husband or mother in-law for confirmation before a decision was taken to go to the hospital. Also, some mothers said the nurses confirmed it, and informed them that their babies had NNJ.

"*I did myself, in the morning I brought my baby out to check because the nurses told us to do so and on the 4th day I realized my baby's eyes was yellow, and my mother in-law and husband confirmed it" (P3).*

"Actually I was delivered through caesarean section and my baby was sent straight to NICU, so when I went there to breastfeed I was informed about it and I observed it myself as well" (P6).

Regarding signs and symptoms of NNJ that present danger to the baby's health and survival were reported among mothers to include; yellow eyes, breathing difficulties and baby not breastfeeding, yellow skin, rising body temperature and when both eyes and palm of the child too changed yellow.

"I think is the yellowish eyes because that is the first sign I saw, and the yellow body, it usually starts from the eyes, and then progresses through the body which it makes more dangerous" (P4).

"I think with my baby, it was the yellow eyes and the baby not feeding because if you don't eat you can't survive" (P5).

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Decision makers to go to the hospital

When it comes to who took the decision for the baby to be send to the hospital, results showed 13 out of 15 puerperal mothers said they took the decision themselves to send the jaundice baby to hospital for treatment. About 2 out of 15 said the decision was suggested by either the mother in-law or husband to go to the hospital or used herbal medicine to treat the condition. Only one of the participants said the decision was taken by both of them (husband and wife) to send the baby to the hospital for treatment.

"I immediately rushed to the hospital because if you (mother) depend on home treatment you might lose your child sometimes; they bath the babies with certain herbs that can complicate the child's condition. ……………………..the baby started sparking temperature and we had to come to the hospital" (P1).

"I brought the baby to the hospital myself, when I realized my baby was not feeding and was becoming weak, I have to rush the baby to the hospital" (P5).

"I decided to bring the child to the hospital because all my friends that their babies had it they send the babies to the hospital and the babies are doing well, and so I decided to bring the baby to the hospital because the doctors and nurses have the knowledge to treat it" (P10).

"Normally, when is like that you can both (husband and wife) agree to take the baby to seek for some helps to control the fever. You can get some helps from the herbalists because they give you some herbs to bath the baby immediately after delivery and sometimes, they give the babies marks and put some of their medicines inside but now you people said we should bring them to hospital" (P15).

With decision for treatment options, results showed 2 out of 15 participants said the family agreed to seeks herbal concoctions known as "*Dowumoa*" which refer to a

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collection of herbs used in the treatment of childhood illnesses like the NNJ and convulsions.

"For me, I was told to seek herbal treatment which they call "Dowumoa" (collections of herbs mixed together), and they say it helps the baby to become strong and prevent them from getting infections and convulsions. It is use to bath the baby few days after delivery and some herbalists too give the baby marks and put some of the medicines inside" (P1).

"I know of a group of herbal concoctions called "Darri", and is given by herbalists to bath the babies after delivery to prevent infections or to clean the baby off infections, the elderly women said the baby was enhancing colour "dozim" (yellowish colour) so I should put the breast milk in the eyes to clear the colour and also put the baby under the morning sun but after two days we realize it was becoming severe and we have to come to the hospital" (P9).

Knowledge on treatment interventions for NNJ

Knowledge of puerperal mothers on the treatment interventions of NNJ showed 14 out of 15 puerperal mothers cited putting the baby under the blue light machine, give medications, ensure frequent breastfeeding, phototherapy, putting the baby under ultra-violet (UV) light or bringing the baby in the early morning sun, and intravenous injections as well as some medications but failed to mentioned the names of the medications.

"I think if you want to treat it you have to let the baby suckling the breast milk very well ………... al…so go to the hospital and see the doctor to give the baby some medications which will help to treat the baby. So, it can be treated through breastfeeding and phototherapy in the hospital but at home, they say we should put the baby in early morning sun" (P5).

"In the hospital they (nurses) put the baby under UV light and I (mother) was asked to express breast milk for the baby and put the baby to breastfeed frequently at home,

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they (elderly women) recommended that I do sun bathing but that was not very effective as compared to the hospital treatment" (P7).

"……………., in the house they (elderly women) said I should put the baby into the early morning sun because it wasn't much so I did that for 2 days and realized it (NNJ) wasn't going that's why I brought my baby to the hospital and now is better, the nurses asked me to breastfeed the baby frequently and they (nurses) kept the baby under the blue lights" (P9).

"Ohhhh, because the nurses told us that when you (mother) go home and you see a change in your baby's eyes you have to bring baby to the hospital and when I came, they put my baby under a blue light and ask me to be breastfeeding the child often and ask me to express breastmilk into a cup so that I can use it to feed the baby in addition" (P13).

However, one of the participants said herbalists could help in treating NNJ since the herbalists sometime gives them some herbs to bath the baby immediately after delivery, and sometimes gives the baby's marks on the skin to put some herbal medicine inside which help in treating the NNJ.

"Yeah, some of the herbalists too can help because they give you (mother) some herbs to bath the baby immediately after delivery and sometimes they (herbalists) give the babies marks (skin cuts) and put some of their (herbalist) medicines inside for the treatment of jaundice" (P2).

In addition to the treatment options, three (3) out of 15 participants cited the use of herbal concoctions such as "*Dowumoa*" and "*Darri*" which are combination of herbal concoctions given by herbalists use in the treatment of NNJ.

"Normally when is like that you can bath the baby with some herbs to control the fever we call them to a "Dowumoa" ……………is use to bath the baby immediately

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after delivery and sometimes they give the babies Marks and put some of their medicines inside but you people said we should bring them to the hospital" (P15)

"I think jaundice can be treated at the hospital when you seek early medical care, because in the house our Mothers say we should put the babies in the early morning sun or we go for the "Darri" (combination of herbs) to clean the fever away but you people say is not good, so we should bring the baby to the hospital for treatment" (P8).

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DISCUSSION

This chapter presents on the discussions section of this study with relevance literatures based on the study objective which sought to investigate knowledge of puerperal mothers on Neonatal Jaundice (NNJ) at the Tamale West Hospital, Northern Region of Ghana. The discussions have been categorized based on the specific objectives to include; awareness and knowledge level of puerperal mothers on NNJ, causes and risk factors associated with NNJ.

Awareness and knowledge level of puerperal mothers on NNJ

Awareness of mothers about NNJ is fundamental to their knowledge level and understanding of the NNJ, and how to prevent the occurrence of the disease among neonates. From the current study, findings showed puerperal mothers' awareness of NNJ was almost universal as most mothers said to have heard NNJ. The heightened awareness of NNJ among puerperal mothers could be attributed to the improved health education given by health workers to patients especially mothers at the hospital. This finding was found to be more advanced compared with findings of Shrestha et al., (2019), which reported awareness of 60% and Khalesi & Rakhshani, (2018) which equally reported in less awareness level of mothers about NNJ as 50%. The less awareness of NNJ among mothers as reported in these studies was attributed to insufficient awareness creation of the disease (NNJ).

Sources of information about NNJamong puerperal mothers

These findings indicated that most of the mothers were aware of NNJ through the nurses' education during antenatal care clinic, and the health talk and education given to mothers at the hospital ANC, the maternity after delivery and on admission at the NICU. However, some of the mothers uttered to have heard about NNJ through the internet, reading of books, television, and from friends and peers. These sources cited by puerperal mothers were found to share similarities with studies conducted by Cooray, (2011); Owusu et al., (2018) in Ghana; and Shrestha et al., 2019, which equally cited similar sources of which mothers have heard about NNJ.

In terms of knowledge on NNJ, results showed nearly all puerperal mothers have some form of understanding about NNJ. Majority of the mothers understood NNJ as the yellowish appearance of the baby's eyes, and some as well stated the passing of yellowish urine and stool to mean jaundice. Some of the mothers understood NNJ as when the baby's palm and soles become yellowish, as well as the body or skin, which were attributed to excess bilirubin level in the baby's blood to mean that the baby had jaundice. Puerperal mothers having knowledge and understanding of NNJ could be due to the improved literacy rate in Ghana as most people now are able to read and write, which could help them to read about the disease on the internet.

Again, it could equally be attributed to the health education and counselling provided by healthcare workers and as well as the health education provided by civil society organizations which form part of their community support service whereby, they educate communities on basic maternal and child health issues such as declaration of the month of May as NNJ month or "Yellow Month" in which activities are scheduled to create awareness of NNJ. Findings were found to share similarities with the studies of Abdul-mumin et al., (2021), and Demis et al., (2021), but these current study contradicted the findings of Cooray, (2011) study which reported less knowledge score of mothers on NNJ with score of 31 ±14, which indicate that a little over half of the mothers were found to have had poor knowledge on NNJ.

Additionally, from the current study, knowledge on the common signs and symptoms of NNJ was above average as most of the mother's, were able to report the signs and symptoms of NNJ to include yellow palm, yellowish and dry skin alongside with yellow eyes. Similarly, these signs and symptoms were found to have been reported by studies such as Khalesi & Rakhshani, (2018) in Nepal, and Shankar et al., (2016)

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which equally reported the signs and symptoms of NNJ to include the yellow eyes and skin, and as well reported 52.5% of mothers to have had inadequate knowledge about NNJ. In term of who was the first to have identified the signs and symptoms of NNJ in the baby showed an average number of mothers were able to identified the signs and symptoms of NNJ themselves, and a few were prompted either by their husbands or mother in-laws of the signs and symptoms of NNJ for a decision to be taken for them to go to the hospital to seek medical treatment. But these were found to share dissimilarities with studies of Li et al., (2020) in Nigeria, and Abdul-mumin et al., (2021) in Ghana, which indicated that most signs and symptoms of NNJ were identified by health workers after the mothers had reported to the hospital. Besides these results from the current study, the findings have showed that, most mothers after observing the signs and symptoms of jaundice on their babies took the decision themselves to send thier babies to the hospital for treatment and mangement. This part of the study findings indicating most mothers to have taken the decision themselves to sent the sick babies to the hospital without the husband approval showed most society are more concern about women empowerment in health decision making now than previously where most healthcare decisions were often reported to have been taken by the husband. However, results still showed that some of the mothers decision to seek healthcare services for the baby were either taken by the mother in-law or the husband, and this sometime lead to delay in health decision making. This still call for more advocacy to educate and empower women to take major healthcare decision to help ensure immediate administration of healthcare interventions to saving lives.

Conjointly, puerperal mothers' knowledge on the treatment interventions of NNJ showed an essential number of puerperal mothers had knowledge on some of the interventions that could be used to treat NNJ. These treatment and management interventions of NNJ were found to include the use of blue light, medications, frequent breastfeeding, phototherapy, putting the baby under ultra-violet (UV) light as well as intravenous injections were reported as treatment and management options for NNJ. Mothers' knowledge on these interventions could equally be attributed to the health education given to them by the health workers, and other civil society organizations that are into health education of communities. However, these stated interventions were found to relate to studies of Khalesi & Rakhshani, (2018), Benova

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et al., (2019), and Said et al., (2018), which equally mentioned some of these interventions as treatment and management options for NNJ.

CONCLUSION

Conclusively, puerperal mothers' awareness and knowledge of NNJ was more, as majority knew the signs and symptoms of NNJ. Signs and symptoms of NNJ were cited to include the yellowish appearance of the baby's eyes as well as the passing out of yellowish urine and stool. Most knew the danger signs of NNJ like rising body temperature, breathing difficulties and baby not breastfeeding, and took the decision themselves to send the child hospital. An increased number of mothers were familiar with the treatment interventions of neonatal and indicate some to include phototherapy and putting the baby under the blue light. Knowledge on causes and risk factors associated with NNJ was above average as most cited infections like malaria, blood disorders, defects of Glucose-6-phosphate dehydrogenase deficiency, and poor nutrition of the mother as causes of NNJ. Most of the mothers were aware of some cultural and religious factors causing NNJ like the consumptions of ritual and herbal drinks known as "*kalgotim*", the application of unhealthy substances like "*bihikpem*" (cow milk oil) and the use of naphthalene balls by mothers.

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