International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Perspectives on Community Determinants of Neonatal Mortality and Unreported Cases Among Women in the Kpandai District, Ghana

Alfred N-Moanbi Teki[1], Gifty Apiung Aninanya[2], Maurice Danang Mikare[3], Anthony Ntajal Nkikpailai[4]

[1]Snr Public Health Officer, Department of public health, Ghana Health Service, Kete-Krachi Municipal Health Directorate. Oti region Ghana
[2]Snr Lecturer, Department of Global Health, School of Public Health, University for Development Studies Tamale., Ghana
[3]Principal Nursing Tutor, Department of nursing, Zuarungu nursing college. Upper east region Ghana
[4]Peadiatric Nurse Specialist, Department of Nursing, St Anne Catholic Hospital. Savannah region Ghana

ABSTRACT

Background: The study sought to identify unreported cases and community perceived factors with neonatal mortality among women in the Kpandai District. In 2015, there were 5.9 million children worldwide who passed away. Of them, 45 percent were newborns, and 36 percent of these neonatal deaths happened within the first 24 hours of birth.

Objective: The aim of this study was to explore the perceived risk factors associated with neonatal mortality among women in the Kpandai District.

Method: A phenomenological study design was used for this study, which adopted a descriptive qualitative approach. Unstructured interview guide was used to interviewed participants on the perceived determinants and unreported cases of neonatal mortality. NVivo version 11 was used for data analysis.

Results: Our results showed that there were 25 unreported neonatal deaths which has no link with institutional records. Majority of the participants revealed that the use of concoction thus locally prepared oxytocin 'Gmanche', Cow dung, shea butter were perceived risk factors for NM. Danger alluded to crossing streams and rivers for ANC, delivery or PNC, distance to health facilities and cost of transportation, prohibition from passing through some roads and trees where the gods reside, not moving during the mid-day and mid-night hours when a woman is pregnant were also perceived risk factors contributing to NM in the district.

Conclusion: The high rate of unreported neonatal deaths in Kpandai is a public health concern. The Government, Ghana Health Service and non-governmental organizations must refocus on interventions like quality and focused ANC and PNC services at the rural areas and enact policies to address rural maternal and neonatal health problems. The Health Belief Model could be used in the educational campaigns, durbars, and radio engagements for the reduction in neonatal deaths.

Keywords: Neonatal Mortality, Community informants, Key informants, Kpandai District, Women.

Introduction

Approximately, global statistics indicate 5.9 million children (16,000 children per day) died in 2015. In this cohort of child mortality, newborns accounted for 45 percent of the deaths during the neonatal period (the first 28 days of life), while early neonatal deaths accounted for 36 percent (United Nations Inter-Agency Group for Child Mortality Estimation: UN IGME, 2018).

According to the United Nations Children's Fund 2.3 million neonatal mortality occurred worldwide in 2020 (WHO, 2021). Hence, according to estimates, there will be 48 million under-5 fatalities worldwide between 2020 and 2030 if current trends continue, almost half of them projected to occur during the neonatal period (Sharrow et al., 2022).

The cumulative rate of neonatal deaths in Africa and Asia is almost 90 percent (United Nations Children's Fund (United Nations Children's Fund (UNICEF), 2015). Every year, 1.12 million newborns die in Sub-Saharan Africa alone (Nwagbara et al., 2022). Notwithstanding, in the United States, in 2016 and 2017 saw a neonatal mortality rates of 3.85 and 1.94, respectively (Ely & Driscoll, 2019). As of 2020, the neonatal mortality rate in the US was 3.4 per 1,000 live births, which is high compared to countries like Finland and Japan, with rates as low as 1.4 and 0.8, respectively (Ely & Driscoll, 2022). However, Sub-Saharan Africa's neonatal mortality rate in 2020 indicated 27 deaths for every 1000 live births, which is far higher compared to the developed regions like Europe reporting 3.5 deaths per 1000 live births (WHO, 2021).

Neonates, specifically in the African region, are confronted with a range of lethal clinical conditions, including prematurity, sepsis, and complications during childbirth, which account for 75 percent of neonatal mortality. Meningitis, tetanus, jaundice, septicemia, and birth asphyxia are among these ailments. These clinical disorders exacerbate the infant mortality when not properly managed (UN IGME, 2019). The region is predicted to account for 60 percent of all under-five mortality by 2050 (UN IGME, 2018).

Neonatal mortality in West and East Africa had a strong correlation with home births, uneducated women, exposure to unprotected water sources, mothers who did not want or plan their final child, and older maternal age (Grady et al., 2017). Male partners' violence and neglect, HIV/AIDS, and disregard for reproductive health and violation of women's reproductive rights in Africa pose a greater risk to neonatal deaths (Mmusi-Phetoe, 2016), how families and communities understand sickness and seek care differ, showing that 40.1 percent of newborns died without obtaining any medical attention (Price & Willcox, 2019).

In Ghana, there were a higher rate of 42 fatalities per 1000 live births in the Asante Region and lower rates of 24 fatalities per 1000 live births in the Upper West and the Northern Region in 2015 (GSS, 2020), population density, and smaller households significantly increase the risk of neonatal fatalities, according to a geographic analysis of neonatal mortality in Ghana (Dwomoh, 2021). Another study revealed that some mothers refused taking folic acid tablets with the belief that their unborn baby would become large contributing to stressful delivery (Ansong et al., 2022). Study conducted on the social determinants of child health in Ghana proposed that variations between rural and urban areas (place of residence) were risk factors for neonatal mortality (Quansah et al., 2016). In 2015, there were 884,000 births in Ghana or roughly 2,400 each day. Before they reached their first month, about 69 newborns every day passed away (UNICEF, 2018). The newborn mortality rate (NMR) in Ghana was 28 fatalities for every 1,000 level births. It further revealed that rural areas contributed 29 deaths per 1,000 live births and urban areas had 33 deaths per 1,000 live births (UNICEF, 2018). In 2020, Ghana recorded neonatal mortality of 23 deaths

per 1,000 live births (UN & IGME, 2021). The 2022 Ghana Demographic and Health Survey revealed that, there were 17 deaths per 1,000 live births for the newborns (GDHS, 2023).

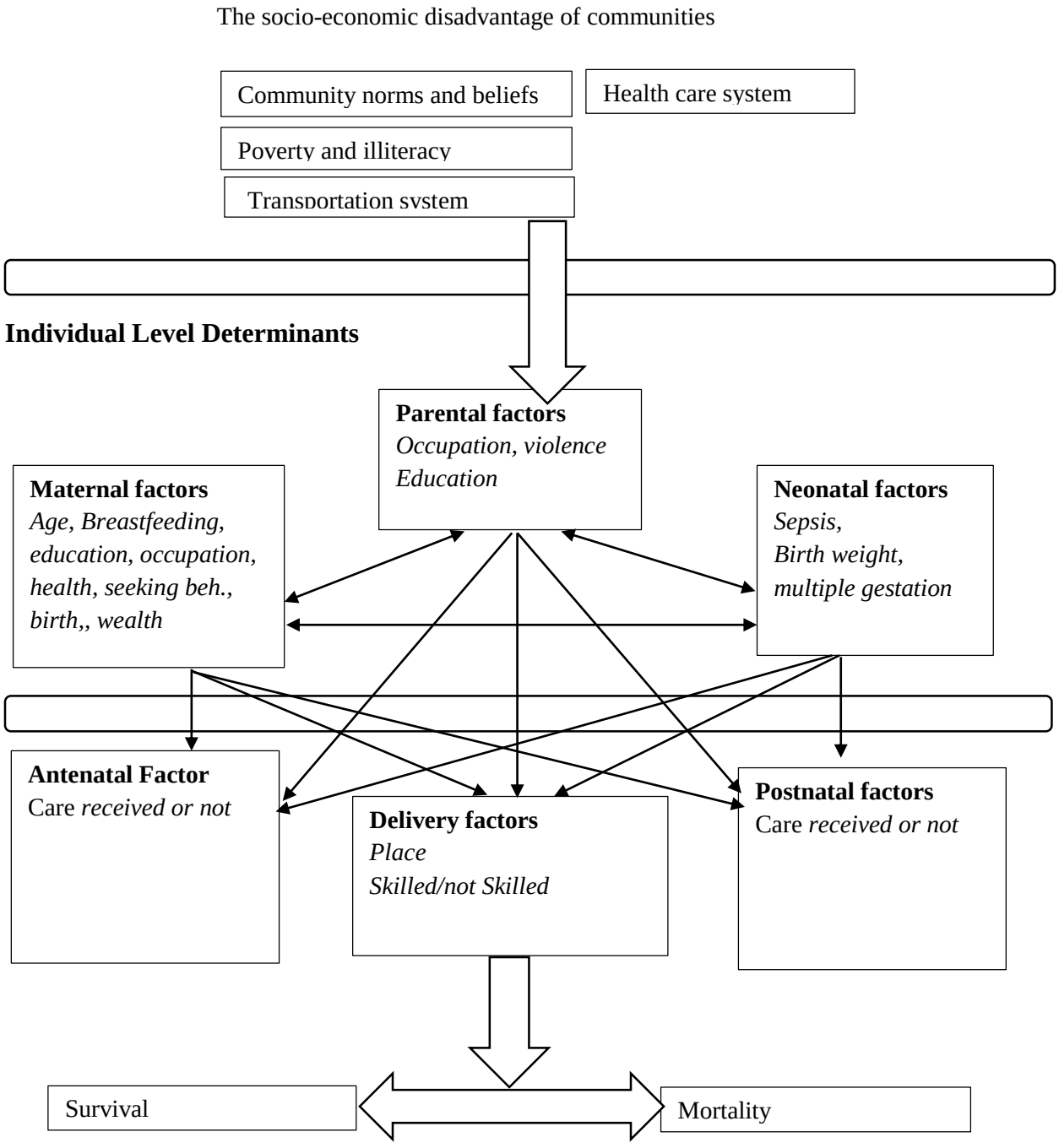
In Kpandai district, institutional data on neonatal mortality was 1 case in 2016. In 2021, the institutional newborn mortality rate was 3.5 deaths per 1000 live births (GHS, 2022). Newborn deaths continue to be high in the Kpandai district despite the availability of expert antenatal care and birth attendants at medical facilities during delivery. Hence, the Ghana National Newborn Health Strategy and Action Plan 2014-2018 was released by the GHS and MOH in response to the unacceptable high rate of neonatal mortality aiming at a 5 percent decrease each year to 21 per 1000 live births in 2018 (MOH, 2014). However, Ghana recorded newborn mortality of 23 per 1,000 live births in 2020 (WHO, 2021), therefore that goal was not met by 2018. Other interventions like the Kangaroo Mother Care (KMC), a low-cost yet effective practice and in-service training to prevent and handle complications during labor and immediately after delivery was introduced by UNICEF Ghana to reduce the risk of NM (UN & IGME), 2021). However, the region has also shown a slower drop in neonatal death over the past 20 years, making it one of the regions that needs significant resources to cut neonatal mortality (Hug et al., 2019; United Nations Inter-agency Group for Child Mortality Estimation (UN & IGME), 2021). These interventions have not had a significant effect in improving newborn mortality in the Kpandai district.

Researches on the unreported cases and community factors that influence newborn death in Ghana including the Kpandai district are rare. Most studies (Welaga et al., 2013; Koffi et al., 2015) conducted in the Northern region are examples. Therefore UN General Assembly's Sustainable Development Goals (SDGs) mandate that all nations achieve a newborn mortality rate (NMR) of 12 deaths per 1000 live births by 2030, at the very least (Mishra & Padhi, 2021). Therefore, it is necessary to step up efforts to further reduce neonatal deaths in rural areas. Hence, the current study seeks to explore the hidden cases and the community factors associated with neonatal mortality in the Kpandai district.

CONCEPTUAL FRAMEWORK

Using an altered framework for the survival of children, individual and societal traits will be investigated for potential links to neonatal death (Kayode et al., 2014). Figure 1.1 shows the adjusted framework for newborn survival.

Community Level Determinants



Theoretical lenses

The Health belief model is a theoretical framework used for health promotion and disease prevention; it explains and predict individual changes in health behaviour. The HBM was developed in the early 1950s by a group of social psychologists at the U.S. (Wethington et al., 2015; Hochbaum et al., 1952).

Tenets of the HBM for neonatal mortality.

Perceived Susceptibility: moms must be aware that they run the danger of giving birth to a child who passes away from avoidable causes.

Perceived Severity: the necessity of comprehending the gravity of neonatal mortality and the possible repercussions for the life of the newborn.

Perceived Benefits: Mothers must comprehend the advantages of adopting preventative measures, such as going to ANC, delivering babies safely, and making sure they receive the right postpartum care.

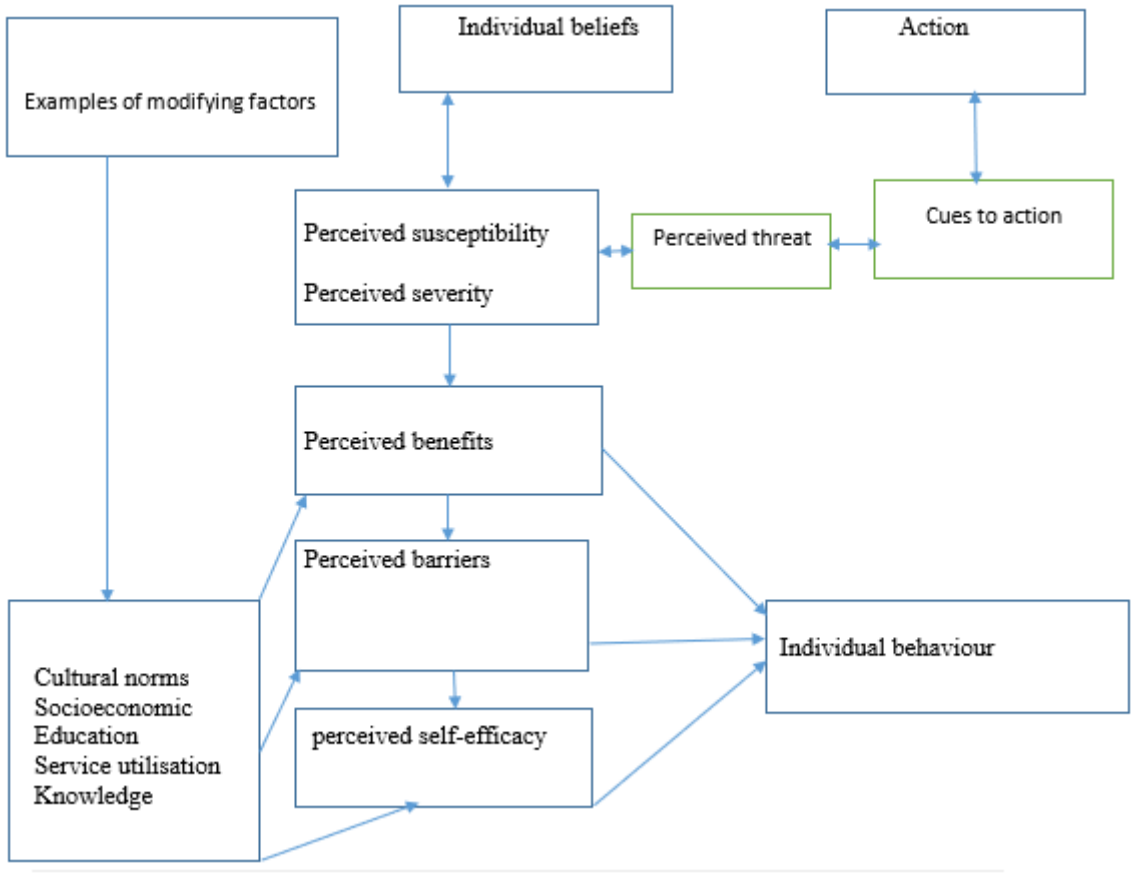
Perceived barriers: recognizing and resolving the obstacles that keep mothers from adopting preventative measures, including cultural customs and beliefs, inadequate transportation systems, and limited access to medical care.

Cues to action; health education campaigns, messaging reminders, and the availability of reasonably priced health services, might motivate moms to take prompt preventive actions.

Self-efficacy; mothers must have the conviction that they can effectively take the required steps to reduce neonatal mortality.

Figure 1.2 Health Belief Model of Neonatal mortality

Updated from Nelson et al., 2021.



Methods and Materials

Study design

The study was conducted in the Kpandai District of Northern Ghana. A phenomenological study design was used. The design aided the principal investigator in understanding the experiences as they manifested in the situations of the study participants, and the way they perceive and understand phenomena, and the meaning the phenomena have in their lives.

Unstructured interview guide was created; key informants interview guide and in-depth interview guide. Using a narrative and descriptive approach to identify the hidden and community determinants of neonatal mortality for the study. The principal investigator contacted 230 communities within Kpandai District to ascertain information from community informants on the hidden or unreported cases of neonatal mortality. A census was then conducted to include all cases of hidden neonatal deaths excluding those captured from health facility records based on evidence gathered from community informants about the deaths.

Study population

The study population include nurses, midwives, and mothers. The rest were Community Health Volunteers [CHVs], Community Health Committee [CHC], and Traditional Birth Attendants [TBAs] in the Kpandai district.

Inclusion and exclusion criteria

Inclusion criteria

Mothers or caregivers who experienced neonatal death for the past year (January 2022– December 2022), health volunteers, CHC members, TBAs, and skilled birth attendants (nurses and midwives) working at public and private health facilities were incorporated into the research.

Exclusion criteria

Women, who had lost a neonate but are insane, including those who are critically ill, and those who consented not to participate, were excluded from the study.

Sampling method

Purposive sampling was applied in the selection of the participants. In all, 235 community informants were contacted, which enabled the principal investigator to acquire relevant information about the hidden cases of neonatal mortality in the district.

Participants who were included in the in-depth interview included: Community informants who disclosed hidden case(s) of neonatal mortality to the investigator. Key informants (nurses/midwives) who were in-charges and had higher facility deliveries as well recorded neonatal mortality. Three health facilities in each of the five sub-districts were selected based on high neonatal mortality records. Mothers/main caregivers who lost a neonate were all involved. Hence, their experience could be shared. The purposive sampling approach aided the principal investigator to include all variations from as many angles as possible and ensuring information richness.

Sample size determination

The study interviewed one hundred and two (102) participants until the saturation point was reached. Thus, the study covered all variances that were anticipated to be of relevance until no new information was found. Therefore, there was no need for further interviews (Boddy, 2015).

Data collection tools and procedures

An interview guide was adapted and updated from the World Health Organization Verbal and Social Autopsy 2016 making room for Informants interview guide and an in depth interview guide to suit the study research objectives. This tool aided in the determination of hidden neonatal mortality in the Kpandai district and the perceived risk factors of newborn deaths, a description of its symptoms, medical history, maternal factors, and conditions that led to the death. The participants were informed about the date of the interview, which took place in their homes. Additionally, they were told that the interview would be captured on tape to aid the principal investigator in replaying the interview for transcription. They signed an informed consent before interviews were carried out. The interviews were undertaken in English for key informants. It was further translated from the English language to the spoken language (Likpakpeln, Nawuri, and Chimburi) for the community informants and mothers/caregivers through an interpreter from each locality. The principal investigator administered the informant's interview guide first to gain insight on the cases of NM, then one-on-one, in-depth interviews to explore the individual and community perceived risk factors. This interviews aided the participants to co-create meaning by reconstructing perceptions of events and experiences related to births, neonatal health, and healthcare delivery. This helped the principal investigator, to understand the participant's individualized experiences, opinions, and intentions as opposed to reality or actions. The setting for each interview was a safe and quiet environment, mostly during the day, where the participant was free and at ease to communicate freely. Also, the timing for each interview section lasted more than 30 minutes.

Data management and analysis

A thematic analysis was carried-out during the data analysis: It is usually used to describe a group of texts, like an interview or a set of transcripts. All the data was carefully identified with common themes, and thus, concepts, and semantic patterns that recur. The rate of hidden cases of (NM) in the district was calculated using neonatal death formulae. All the information was tape-recorded and verbatim transcription with behavioural comments (such as giggling, sobbing, and pausing) and a phonetic transcription of filler words and dialects that are pertinent to the analysis. Both the protocols and transcripts were coded into paragraphs as the end product of descriptive theory. The qualitative data management tool (NVivo version 11) was used to ensure completeness and accuracy of the data collected from each participant each day in which the data collection was done. The data was stored on a drive for a period of one year before being deleted or discarded.

Results

Participant's socio-demographic attributes

Interpretation of socio-demographic characteristics of community informants

The community informants were thirty four (34) [health volunteers, CHC members, TBAs] made up of eighteen (18) males, and sixteen (16) females. Table 4.1 depicts the demographic characteristics of the participants.

Table 4.1 Community informants' socio-demographic attributes

Community informants		N	Percentage (%)
Sex	Male	18	55.6%
	Female	16	44.4%
	Total	34	100.0%
Marital status	Married	23	67.6%
	Single	7	20.6%
	Divorce	4	11.8%
	Total	34	100.0%
Educational level	no formal education	8	23.5%
	Primary	6	17.6%
	JHS	4	11.9%
	SHS	8	23.5%
	Tertiary	8	23.5%
	Total	34	100.0%
Occupation	Farmer	13	38.23%
	Nurse	0	0.0%
	Teacher	8	23.5%
	Trader	13	38.23%
	Total	34	100.0%
Age		**Min**	**Max**
		23	66

Interpretation of socio-demographic characteristics of Mothers /caregivers

Mothers /caregivers were thirty two (32). Their age distribution shows a minimum age of 17 years and an average age of 27, with a maximum age of 49 years. Their average age at marriage was 19 years old, with a minimum age of 15 and a maximum age of 24 years.

Table 4.2 depicts the socio-demographic characteristics of mothers/main caregivers.

Mothers/caregivers		n	Percentage (%)
Mother's Education	no formal education	15	46.9%
	Primary	9	28.1%
	JHS	6	18.8%
	SHS	2	6.3%
	Tertiary	0	0.0%
	Total	32	100.0%
Occupation	Farmer	22	68.8%
	Nurse	0	0.0%

	Teacher	0	0.0%
	Trader	10	31.2%
	Total	32	100.0%
Marital Status	Married	27	84.4%
	Single	5	15.6%
	Divorce	0	0.0%
	Total	32	100.0%
Husband's education	no formal education	17	53.1%
	Primary	2	6.3%
	JHS	7	21.9%
	SHS	6	18.8%
	Tertiary	0	0.0%
	Total	32	100.0%
Breadwinner's Occupation	Farmer	21	65.6%
	Nurse	0	0.0%
	Teacher	2	6.3%
	Trader	9	28.1%
	Total	32	100.0%
Mother's Age		**Min**	**Max**
		17	49
Age at marriage		15	24

Interpretation of socio-demographic characteristics of key informants.

The key informants, thus the nurse/midwife, were made up of thirty six (36) participants; 16 nurses and 20 midwives. Males (15) and females (21).

Figure 4.3 depicts the socio-demographic characteristics of key informants

Key informants		**N**	**Percentage (%)**
Sex	Male	15	41.7%
	Female	21	58.3%
	Total	36	100.0%
Educational level	no formal education	0	0.0%
	Primary	0	0.0%
	JHS	0	0.0%
	SHS	0	0.0%
	Tertiary	36	100.0%
	Total	36	100.0%
Occupation	Nurse	16	44.4%

	Midwife	20	55.6%
	Total	36	100.0%
The sub-district that you work	Kpandai sub	11	30.6%
	Kabonwule sub	9	25.0%
	Kitare sub	7	19.4%
	Sabonjida sub	9	25.0%
	Total	36	100.0%
Type of health facility	CHPs	14	38.9%
	Health Centre	13	36.1%
	Hospital	9	25.0%
	Total	36	100.0%
		Min	**Max**
Age		27	43
TOTAL(N)		**102**	**100.0%**

Hidden cases of neonatal mortality in the Kpandai district

All participants admitted that there were hidden cases of neonatal mortality in the communities. Among the two hundred and thirty (230) communities in the Kpandai district, only twelve (12) communities reported hidden cases of neonatal mortality and twenty-five (25) cases were reported. Among these cases, fifteen (15) were males, and ten (10) were females.

Figure 4.4 depicts communities with the hidden cases of neonatal mortality.

SN	Community	Number of hidden cases	Sex		Early NM	Late NM
			Male	Female		
1	Buya	3	2	1	3	0
2	Meme	2	1	1	1	1
3	Ugorja-do	2	0	2	0	2
4	Vume	1	1	0	1	0
5	Wasawasa	2	1	1	2	0
6	Kakpeni	5	3	2	4	1
7	Malando	2	1	1	1	1
8	Danando	1	1	0	1	0
9	Lanbado	2	2	0	0	2
10	Chakori	2	0	2	2	0
11	Kabonwule	1	1	0	1	0
12	Blajai	2	2	0	1	1
Total					17	8

Using the formula for neonatal mortality: Total number of deaths ÷ total number of live births ×1000

In 2022, there were 4052 live births in the Kpandai district.
The number of hidden neonatal cases was 25.
Therefore, the NMR is 25÷4052× 1000
Hence, it was discovered that there were six (6) hidden cases of newborn mortality for every 1000 live births.

Perceived community determinants of neonatal mortality

All study participants disclosed that pregnant women were required to give birth in a health facility. Hence, those who delivered at home and their babies died were afraid to report to the health facilities for fear of possible blame.

"When I delivered at home, my baby fell sick, yet we couldn't visit the hospital, so she did not survive it. I visited the hospital with another pregnancy, and the nurses asked about my baby, so I narrated everything, but I was not happy with their responses at all; they kept blaming me, and some also rained insults on me" (mother, 23 years).

This response was confirmed by all the midwives. The quote below depicts the affirmation. *"The pregnant women are not serious at all; whenever the labor sets in, they will stay at home and deliver there. If anything happens to the child, they want you to perform magic for them, so when they deliver at home, some of the midwives insult them a lot, which causes fear and panic in them, which reduces access to health services" (midwife).*

Distance (transportation) from home to health facilities and the bad nature of roads were some perceptions a few midwives and mothers/caregivers had about perceived determinants of neonatal mortality.

"During labor, I was referred to the district hospital from a Chps facility, there was no car or motor readily available; the only car that we could use was when it was a market day in the nearby community, yet it was difficult for a woman in labor to sit on a motorbike for longer distance;, hnnn… it had an effect on the neonate. Yet we struggled to get to the district hospital, but I was distressed, which made my labor very difficult and I do believe that has affected the child, so it's painful to lose a child when it could have been avoided" (Mother, 33 years).

Some of the nurses also attested to the admissions made by the mothers, as the quote below suggest: *"Most of the women are far from the district hospitals, so unavailability and cost of transportation in some communities do not permit them to receive the health services they need timely. Sometimes the cases are referrals, so when labor is completed and the mother goes home, it becomes difficult to return to the health facility even if the baby falls ill; hence, they try to manage it"(senior staff midwife).*

Further, some of the communities don't have any social support systems that can aid them during times of labor; an example is the community emergency transport system, and this was also revealed by the CHC members.

"My husband didn't have a motor, and there was no means of transportation readily available at the time, so my labor prolonged, and I delivered at home. Our husbands will not come together and buy some means of transport for emergency cases within the community; it feels so sad when you lose your child when you could have saved him or her with just a means of transportation" (mother, 37 years).

The social support system was further affirmed by some community health committee members, as this quote suggests: *"As for our community, we don't have anything like a motor bike that is meant for the community to transport us to the district hospital when our women are referred from our clinic during labor or neonatal health needs" (CHC member).*

The danger alluded to by crossing rivers and streams during flooding periods was a common view that prevented mothers and caregivers from reporting to health facilities during labor and child health needs, as expressed by the health volunteers, CHC members, and mothers in the quotes below.

"During the rainy season, we do not have access to medical institutions capable of offering the necessary medical services we need, because the river and streams are mostly flooded and the bad nature of the roads does not permit us to access health care. Sometimes for our women to have access to the district hospital, they have to cross two or three streams, making it very difficult for them to go for their ANC and PNC." (Health Volunteer).

"My woman was in labor when our stream was flooded to the brim. It became difficult to cross, yet there was no health worker around to attend to her; the labor was prolonged, and later she delivered, but we couldn't have the baby in some hours" (CHC member).

"I prefer the delivery at home to cross this stream to go to the hospital for ANC or delivery; it's very dangerous and you could lose your life" (mother, 42years).

Some community practices, such as the use of locally prepared concoctions (local oxytocin), shea butter, and cow dung, were also perceived to be determinants of neonatal mortality. Some of these practices were revealed among a few nurses, midwives, and mothers, as expressed in the various quotes.

"As for some pregnant women, when labor sets in, they resort to drinking some locally prepared concoctions popularly known as "local oxytocin (Gmanche)." This is mostly practiced by Konkomba women; even when you insert your hand through to access the stage of labor, you realize that your hand has some black particles, and mostly some of them admit that they have taken it with the aim of reducing the pain and to fasten labor, but it rather prolongs the labor, hence asphyxia normally sets in" (Staff midwife).

"They use shea butter and cow dung to take care of the umbilical cord, but it rather keeps the cord moist and infected instead of spirit and cotton or chlorhexidine, even though the chlorhexidine is recommended by the World Organization but is not available in our facilities at the moment, so at the facility level we resort to the spirit and cotton, but when they're discharged they begin to use the shea butter and cow dung" (pediatric nursing officer).

These practices were reaffirmed by a few TBAs, as suggested in the quote, *"What we use to take care of the umbilical cord is shea butter because when the woman delivers at home, no health worker will come and tell us to use this medicine or that, so we resort to using our shea butter" (TBA).*

They don't believe in exclusive breast feeding, so within a week, some mothers give food to the child with the belief that the baby is not fat (staff midwife).

Community beliefs such as not passing certain areas where the gods reside, not moving during the mid-day and mid-night hours and self-delivery to prove bravery were also perceived by a few mothers, health volunteers, and midwives, as shown in the various quotes.

"In this community, Day and night, from 12:00 pm to 1:00 pm and from 12:00 am to 1:00 am, evil spirits move around, so if a woman wants to move around that time, evil spirits move around so if a woman wants to move around that time these evil spirits can easily cause harm to them or their new-borns after delivery, so they are restricted during this period, yet that time can be moments they need to visit or will be returning back from the health facility, so most women default on their routine care, and some of the neonatal deaths are a result of that" (Health Volunteer).

"When we are pregnant, we are not allowed to cross certain areas where the gods reside in the community, or cross some streams and even some roads that are linked through the site of the gods within the

community; we are told it could bring bad omens to us and our unborn child, so whenever we are pregnant, we can't access those roads, so it affects our ANC, labor, and postnatal care" (mother, 34years).

Few of the nurses and midwives affirmed the accession in the quote below. *"Some of the women believe that they have to give birth at home and by themselves to show that they are brave, which will make them gain some recognition among their colleagues; some also believe that eggs are very nutritious and that if they eat them, their baby will grow bigger, which will result in difficult labor" (staff midwife).*

"We believe that if a child will have life on this earth, even within one month, the child will not be sick, so if the baby is sick within one month, we only consult the deities to know the destiny of the child, so what outcome from the deities is adhered to, God gives and God takes" (mother, 41 years).

In this place, when a child is born with some kind of congenital abnormality, the parents of the child consult the gods to see if the child is good or not, so it depends on what they hear from the gods before the child can be safe or eliminated through any means [CHC member].

DISCUSSION

Perceived hidden cases of neonatal mortality in the Kpandai district

The study revealed that there were twenty five (25) unreported cases of neonatal mortality. These cases were found in the rural communities far from the district hospital. The Kpandai District Health Directorate Annual Report in 2022 states that the total number of neonatal deaths reported was six (6). Hence, twenty-five (25) unreported neonatal deaths from this study showed that Kpandai has a hidden neonatal death higher than their institutional neonatal deaths.

Some studies have been conducted on the hidden or unreported cases of neonatal mortality across the world. A study revealed an underreporting of neonatal deaths as 16 deaths per 1000 live births (284 neonatal fatalities) as opposed to the official rate of 4.2 deaths per 1000 live births (Målqvist et al., 2008). A study revealed that most neonatal deaths cannot be accounted for, and that neonates are regarded by the community as strangers until their 40th day of life. Their deaths are not discussed and It's forbidden for mothers to grieve for their lost loved ones for fear of upsetting God and causing further newborn deaths (Sisay et al., 2014). Another study suggested that most cases of neonatal death occur at homes of low-income individuals and developing nations, which are least talked about (Lawn, 2008).

Aiming to reduce neonatal mortality should not only focus on institutional neonatal mortality data, all deaths related to neonates whether institutional or hidden should be of a priority. The SDG 3.2 focuses on institutional data toward reducing NM to 12 deaths per 1000 live births by 2030 (Sharrow et al., 2022). Reporting of these hidden cases would create awareness and inform the intervention needed at the local, national, and international levels. Re-visitation of national and international neonatal policies is critical for reducing NM, For examples, "every woman every child" and "global newborn action plan" (GHS/MOH, 2020), World Health Organization standards of care for small and unwell babies, and global initiative for quality of care for maternal and neonatal care (GHS/MOH, 2020; WHO, 2020). A study also revealed that specialized groups of professional health workers are needed in all areas of the country to augment reproductive and child health services, example, doctors, midwives, and pharmacists, among others (Asamani et al., 2021).

Perceived community determinants of neonatal mortality

The study has revealed some perceived factors that risk neonatal mortality; among them were transportation challenges, community practices, and beliefs. During times of health care, many women

choose difficult and unsafe routes that endanger their babies and themselves. For example, the majority of participants mentioned that cost of transportation, perennial flooding, poor road conditions, distance to a district hospital, and unavailability of transportation were all challenges they perceived as determinants of neonatal mortality in the district. Similar studies support the finding that some of the challenges are transportation, the distance to health services and the state of the roads for women in rural areas in accessing health care facilities when in need, serves as danger signs for neonatal survival (Atuoye et al., 2015; Tette et al., 2020; Wuni et al., 2023). Access to a good road network, availability of transportation, and closeness of health facilities to women, improve child and maternal health (Broni et al., 2014; Chirla et al., 2021).

Some communal practices are dangerous to women and the neonates such as the use of *('Gmanche'*) to ease labor as revealed by the majority of the study participant. Studies conducted in Ghana have revealed similar practices among women and traditional birth attendance who use herbs during labor to facilitate smooth delivery (Ansong et al., 2022; Otoo et al., 2015). This practice puts the women in distress and, prolongs the labour, causing bleeding. The lengthy labour is mainly associated with neonatal hypoxia, based on research done in Bangladesh (Choudhury & Ahmed, 2011). Again, the use of shea butter was a major practice among the study participants for this current study, but a few also used cow dawn to cater for the umbilical cord. Findings from low and middle income states indicated that the use of shea butter and cow dawn for cord care risk the neonates to infections (Coffey & Brown, 2017; Opoku Asiedu et al., 2019).

The belief of not passing certain roads linked to where the gods reside and walking in the afternoon or night between the mid-hours to access health services was revealed by a few participants. Myths deter so many women from accessing health services having a toll on neonatal health (Wibowo et al., 2018; Ahmad et al., 2019; Ansong et al., 2022). Extensive health education and community engagement have a significant influence on these myths across cultures and could impact women positively (Wibowo et al., 2018).

Strengths and Limitations of the Study

The current study findings has filled an important knowledge gap in the Kpandai district. The results are also in line with previous related works. Nonetheless, this was a qualitative study and so future studies should use mixed method approaches to assess determinants of neonatal mortality among mothers to enable a generalization of the study without limitations.

Conclusions

Neonatal mortality was high in the Kpandai district. ANC, PNC, sepsis, aneamia and pneumonia, transportation, beliefs were some perceived risk factors that contributed to NM.

Hence, there's need for urgent stakeholder engagement thus GHS and partners, community leaders and NGOs to heighten support and policy at national and local communities for a healthy child population. The Health Belief Model would be instrumental during the educational campaigns, focused ANC and PNC services, durbars, and radio engagements to reduce NM.

Recommendations

Kpandai DHD must implement community surveillance on hidden NM, intensify focused ANC and PNC, enforce death audit and advocate for support from NGOs towards the abolition and amendments of some

community norms and practices that hinder and risk mothers and their newborns. MOH/GHS must enforce supervision of existing policies on neonatal health and child health programs to make health care more responsive.

Abbreviations and Acronyms

UNICEF= United Nations International Children Emergency Fund, U5MR= Under 5 Mortality Rate, GHS= Ghana Health Service, DHIMS= District Health Information Management System, WHO =World Health Organization, MOH= Ministry of Health, NMR=Neonatal Mortality Rate, CHPS=Community Based Health Planning and Services

Declarations

Ethical Approval and Consent to participate

Informed consent was obtained from the patient and anonymity was maintained. Ethical approval was obtained from Kwame Nkrumah University of Science and Technology with Ethical Approval Number (CHRPE/AP/785/23).

Availability of data and materials

The corresponding author can provide the data created and analysed during the study upon reasonable request.

Competing interests

According to the writers, they have no potential conflicts of interest.

REFERENCES

1. Ahmad, N., Nor, S. F. S., & Daud, F., "Understanding myths in pregnancy and childbirth and the potential adverse consequences: A systematic review". *Malaysian Journal of Medical Sciences*, July 2019, *26*(4), 17–27. https://doi.org/10.21315/mjms2019.26.4.3
2. Ansong, J., Asampong, E., & Adongo, P. B., "Socio-cultural beliefs and practices during pregnancy, child birth, and postnatal period: A qualitative study in Southern Ghana". *Cogent Public Health*, December 2022, *9*(1). https://doi.org/10.1080/27707571.2022.2046908
3. Asamani, J. A., Ismaila, H., Plange, A., Ekey, V. F., Ahmed, A. M., Chebere, M., Awoonor-Williams, J. K., & Nabyonga-Orem, J., "The cost of health workforce gaps and inequitable distribution in the Ghana Health Service: an analysis towards evidence-based health workforce planning and management". *Human Resources for Health*, March 2021, *19*(1), 1–15. https://doi.org/10.1186/s12960-021-00590-3
4. Atuoye, K. N., Dixon, J., Rishworth, A., Galaa, S. Z., Boamah, S. A., & Luginaah, I., "Can she make it? Transportation barriers to accessing maternal and child health care services in rural Ghana". *BMC Health Services Research*, August 2015, *15*(1), 1–10. https://doi.org/10.1186/s12913-015-1005-y
5. Boddy, C. R., "Sample size for Qualitative Interviews. *Qualitative Market Research", An International Journal*, September 2016, (*19*), 426–432.
6. Broni, A. O., Aikins, I., Asibey, O., & Agyemang -Duah, P., "The Contribution of Transport (Road) in Health Care Delivery "a Case Study of Mankranso District Hospital in the Ahafo Ano South District of Ashanti Region". *British Journals of Marketing Studies*, 2014, *2*(4), 2053–4051. www.eajournals.org

7. Chirla, D. K., Children, R., Care, P., Panigrahy, N., Children, R., & Care, P., *Neonatal transport Chapter-17.pdf(Hand Book of Neonatology, Second Edition,July 2021*.
8. Choudhury, N., & Ahmed, S. M., "Maternal care practices among the ultra poor households in rural Bangladesh: A qualitative exploratory study". *BMC Pregnancy and Childbirth*, March 2011, *11*, 1–8. https://doi.org/10.1186/1471-2393-11-15
9. Coffey, P. S., & Brown, S. C., "Umbilical cord-care practices in low- and middle-income countries: A systematic review". *BMC Pregnancy and Childbirth*, February 2017, *17*(1), 1. https://doi.org/10.1186/s12884-017-1250-7.
10. Dwomoh, D., "*Geospatial analysis of determinants of neonatal mortality in Ghana"*. BMC public health, March 2021, 1–18.
11. Ely, D. M., & Driscoll, A. K., "Infant mortality in the United States, 2017: Data from the period linked birth/infant death file". *National Vital Statistics Reports*, August 2019, *68*(10), 1–19.
12. Ely, D. M., & Driscoll, A. K., "Infant Mortality in the United States, 2020: Data From the Period Linked Birth/Infant Death File". *National Vital Statistics Reports*,September 2022, *71*(5), 1–17. https://doi.org/10.15620/cdc:120700.
13. GHS., Kpandai District Health Directorate Annual Report" 2022.www.chimgh.org/dhims-2
14. GDHS., "Demographic and Health Survey". *2022*, 1–23.
15. GHS/MOH., "*Standards for Newborn Health"*. *June 2020*.
16. Grady, S. C., Frake, A. N., Zhang, Q., Bene, M., Jordan, D. R., Vertalka, J., Dossantos, T. C., Kadhim, A., Namanya, J., Pierre, L. M., Fan, Y., Zhou, P., Barry, F. B., & Kutch, L., "Neonatal mortality in East Africa and West Africa: A geographic analysis of district-level demographic and health survey data". *Geospatial Health*, May 2017, *12*(1). https://doi.org/10.4081/gh.2017.501
17. GSS., "*Ghana statistical service , population and housing census"*. *2021*. *21*(1), 1–9. http://journal.um-surabaya.ac.id/index.php/JKM/article/view/2203
18. Hug, L., Alexander, M., You, D., & Alkema, L., "National, regional, and global levels and trends in neonatal mortality between 1990 and 2017, with scenario-based projections to 2030: a systematic analysis". *The Lancet Global Health*, Sept 2019, *7*(6), e710–e720. https://doi.org/10.1016/S2214-109X(19)30163-9
19. Kayode, G. A., Ansah, E., Agyepong, I. A., Amoakoh-coleman, M., Grobbee, D. E., & Klipstein-grobusch, K., "*Individual and community determinants of neonatal mortality in Ghana : a multilevel analysis"*. May 2014, 1–12.
20. Koffi, A. K., Libite, P. R., Moluh, S., Wounang, R., & Kalter, H. D., "Social autopsy study identifies determinants of neonatal mortality in Doume, Nguelemendouka and Abong-Mbang health districts, Eastern Region of Cameroon". *Journal of Global Health*, June 2015, *5*(1). https://doi.org/10.7189/jogh.05.010413
21. Lawn, J., "Hidden deaths of the world's newborn babies". *Bulletin of the World Health Organization*, April 2008, *86*(4), 250–251. https://doi.org/10.2471/blt.08.040408
22. Målqvist, M., Eriksson, L., Nga, N. T., Fagerland, L. I., Hoa, D. P., Wallin, L., Ewald, U., & Persson, L. Å., "Unreported births and deaths, a severe obstacle for improved neonatal survival in low-income countries; a population based study". *BMC International Health and Human Rights*, March 2008, *8*, 1–7. https://doi.org/10.1186/1472-698X-8-4
23. Mishra, U. S., & Padhi, B., "Sustaining the sustainable development goals". *Economic and Political Weekly*, August 2021, *56*(34), 30–31.

24. Mmusi-Phetoe, R. M. M. (2016). Curationis. *Curationis*, *39*(1), 8. https://curationis.org.za/index.php/curationis/article/view/1571/1966
25. MOH., "*Ghana National Newborn Health Strategy and Action Plan 2014 – 2018"*. *July 2014*, 1–4.
26. Nwagbara, U. I., Osuala, E. C., Chireshe, R., Babatunde, G. B., Okeke, N. O., Opara, N., & Hlongwana, K. W., "Mapping evidence on factors contributing to maternal and child mortality in sub-Saharan Africa: A scoping review protocol". *PLoS ONE*, August 2022, *17*. https://doi.org/10.1371/journal.pone.0272335.
27. Opoku Asiedu, S. S., Ansah Apatu, N. A., Tetteh, R., & Hodgson, A., "Neonatal Cord Care Practices among Mothers and Caregivers in the Volta Region of Ghana". *International Journal of Maternal and Child Health and AIDS (IJMA)*, 2019, *8*(1), 63–69. https://doi.org/10.21106/ijma.272.
28. Otoo, P., Habib, H., & Ankomah, A., "Food Prohibitions and Other Traditional Practices in Pregnancy: A Qualitative Study in Western Region of Ghana". *Advances in Reproductive Sciences*, August 2015, *03*(03), 41–49. https://doi.org/10.4236/arsci.2015.33005.
29. Price, J., & Willcox, M., *"Progression in the final illnesses of children under five years of age in sub-Saharan Africa : a systematic review"*. December 2019, *9*(2). https://doi.org/10.7189/jogh.09.020422.
30. Quansah, E., Ohene, L. A., Norman, L., Mireku, M. O., & Karikari, T. K., "Social factors influencing child health in Ghana". *PLoS ONE*, January 2016, *11*(1), 1–20. https://doi.org/10.1371/journal.pone.0145401
31. Sharrow, D., Hug, L., You, D., Alkema, L., Black, R., Cousens, S., Croft, T., Gaigbe-Togbe, V., Gerland, P., Guillot, M., Hill, K., Masquelier, B., Mathers, C., Pedersen, J., Strong, K. L., Suzuki, E., Wakefield, J., & Walker, N., "Global, regional, and national trends in under-5 mortality between 1990 and 2019 with scenario-based projections until 2030: a systematic analysis by the UN Inter-agency Group for Child Mortality Estimation". *The Lancet Global Health*, February 2022, *10*(2), e195–e206. https://doi.org/10.1016/S2214-109X(21)00515-5
32. Sisay, M. M., Yirgu, R., Gobezayehu, A. G., & Sibley, L. M., "A qualitative study of attitudes and values surrounding stillbirth and neonatal mortality among grandmothers, mothers, and unmarried girls in rural Amhara and Oromiya regions, Ethiopia: Unheard souls in the backyard". *Journal of Midwifery and Women's Health*, January 2014, *59*(SUPPL1). https://doi.org/10.1111/jmwh.12156.
33. Tette, E. M. A., Nuertey, B. D., Akaateba, D., & Gandau, N. B., "The transport and outcome of sick outborn neonates admitted to a regional and district hospital in the upper west region of ghana: A cross-sectional study". *Children*, March 2020, *7*(3), 1–15. https://doi.org/10.3390/children7030022.
34. UN IGME., "Levels & Trends in Child Mortality: Estimates: Report 2018". *Who/Unicef/World Bank/Un*, 2018, 1–48.
35. UN IGME., "Levels & Trends in Child Mortality 2019". *United Nations Children's Fund*, 2019, 52.
36. UNICEF., "Maternal and newborn health disparities in Guinea: Key facts". *Data.Unicef.Org*. 2018. https://data.unicef.org/resources/maternal-newborn-health-disparities-country-profiles/.
37. United Nations Children's Fund (UNICEF)., "*Committing to Child Survival : A Promise Progress Report 2015, Key findings"*. 2015, 1–12. www.apromiserenewed.org.
38. United Nations Inter-agency Group for Child Mortality Estimation (UN, & IGME)., "*Levels & Trends in Child-Mortality"*. file:///C:/Users/User/Downloads/UNICEF-IGME-2021 report.pdf.
39. WHO., "*Standards for improving the quality of care for small and sick newborns in health facilities*".2020 https://apps.who.int/iris/bitstream/handle/10665/334126/9789240010765-eng.pdf?sequence=1&isAllowed=y

40. WHO., "*GHANA ' S NETWORK FOR IMPROVING QUALITY OF CARE FOR MATERNAL , NEWBORN AND CHILD HEALTH". July 2021-December 2021 Bulletin*. https://www.unicef.org/ghana/reports/quality-care...
41. Wibowo, A., Machdum, S. V, Cholid, S., & Imelda, J. D., "Pregnancy-related Myths and Maternal Mortality Reduction". *KnE Social Sciences*, August 2018, *3*(10), 84. https://doi.org/10.18502/kss.v3i10.2906
42. Wuni, F. K., Kukeba, M. W., Yakubu, Z., Nyaabila, E. A., & Saanwie, A. S., "Contributory factors to early neonatal deaths in the Upper East Regional Hospital in Ghana". *Ghana Medical Journal*, June 2023, *57*(2), 128–133. https://doi.org/10.4314/gmj.v57i2.7