Vol. 15(3), pp. 184-193, July-September 2023
DOI: 10.5897/JPHE2023.1452
Article Number: 7DB39CD71079
ISSN 2141-2316

http://www.academicjournals.org/JPHE

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Journal of Public Health and Epidemiology

Full Length Research Paper

Perceived quality of healthcare provided by patent medicine vendors in rural and remote communities of low- and medium-Income countries (LMICs): A perspective from Nigeria

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Received 27 June, 2023; Accepted 4 August, 2023

Perceived quality of healthcare is a strong predictor of continuous utilization of healthcare. There is dearth of current evidence on the perception of the quality of the healthcare received from patent medicine vendors (PMVs) in low- and medium-income countries (LMICs). This study, therefore, through the lens of hard-to-reach communities in Nigeria seeks to assess the perception of the quality of healthcare provided by PMVs as well its determinants. It was a cross-sectional study of 339 residents of 20 purposively selected rural and remote villages conducted between January and May, 2022 in Jigawa State, Nigeria. We adapted, digitized, and used the interviewer-administered questionnaire on laypeople's perception of the quality of primary care to collect the data for the study. Data were analysed with the Stata version 16 and statistical significance was determined at P<0.05. We found that 62.5% of the rural and remote community dwellers that were studied perceived poor quality of healthcare services provided by the PMVs. Participants who were older than 44 years, are of the Hausa tribe and have health insurance coverage were more likely to perceive good quality care compared to others. The findings highlight that while many dwellers of rural and remote communities receive healthcare services from PMVs, they perceive the quality of care they receive to be poor. This could potentially limit the success of any proposed expansion of more basic health services to the PMVs in rural and remote communities.

Key words: Patent medicine vendors, perceived, quality of care, rural and remote.

INTRODUCTION

Low- and Middle-income countries (LMICs) record millions of avoidable deaths of children and adults every year (WHO, 2014; GBD Mortality and Cause of Death collaborators, 2018a). According to the World Health Organization (WHO, 2003), the health worker-to-population ratio is far lower in LMICs (compared to high-income countries (Roush et al., 2013). An adequate health workforce is a critical resource for increasing the effective coverage of the available health interventions that can avert avoidable mortalities (Hauri et al., 2004; Scheffler et al., 2008). About one-quarter (24%) of the global disease burden is in Africa and these are left to the care of only 3% of the global healthcare workers (SWISS Agency for Development and cooperation, 2011). The health workforce inadequacy in LMICs is not only due to the limited production of skilled health workers but also to skill mix, mass migration to high-income countries, and skewed distribution of the limited available human resource in favor of urban locations (Roush et al., 2013).

The "over-concentration" of the human resource for health in urban areas at the expense of poorer, hard-to-reach and medically under-served areas has been well documented in many LMICs (Martinenez and Martineau, 2002; Kodali, 2023). This inequitable distribution of human resources for health fuels a 'double-barrelled jeopardy" of inadequate access to basic healthcare (OECD, 2020) and poor quality of the limited available basic healthcare services (Berwick et al., 2018) in LMICs. Consequently, many residents of LMICs are left to the care of unskilled informal healthcare providers under an unregulated regime of healthcare (OECD, 2020). Though many LMICs lack accurate data on their actual size and spread (Berwick et al., 2018), the informal private sector providers have been reported as responsible for providing about half of the childcare services across sub-Saharan Africa (Marriott, 2009). Drug shops (also known as Patent Medicine Vendors or PMV) comprise nearly 40% of these private sector providers (Goodman et al., 2007) and have been reported to provide 15 to 83% of childcare services in the African region (Ahmed et al., 2009).

In many African countries, the PMVs are more widely distributed in rural areas than conventional health facilities; with about 40% of them operated by a skilled health workforce (Akuiyibo et al., 2022) serving as the only healthcare provider in many hard-to-reach communities (Abdulraheem and Parakoyi, 2009). While their role remains largely unexplored in many settings, there is a growing interest in accommodating the informal healthcare provider (including the PMVs) into healthcare systems in LMICs to expand access to basic health. (Marek et al., 2005) services in developing countries (Abuya et al., 2009). LMICs (including Tanzania, Kenya, Nigeria, Bangladesh, and India) have included PMVs in national health interventions ((Abuya et al., 20010; Rutta et al., 2011; Kruk et al., 2018; Daini et al., 2018). Nigeria is on the verge of expanding the healthcare services that skilled healthcare personnel operating PMV can provide under a new accreditation system dubbed "PMV Tiering Policy".

While leveraging on the PMVs to increase access to healthcare is desirable, concerns exist regarding the quality of care they provide (Usar 2016). Available data suggest that about 5 million of the annual deaths in LMICs are due to poor quality of care and an additional 3.6 million due to the non-utilization of healthcare (Akunyibo et al., 2022). Unsafe medical practices and medical errors cost LMICs 42 billion US dollars annually (WHO, 2018). PMVs have been documented to provide healthcare services beyond the scope of their training and licensure, including the provision of family planning services (Waters and Peters, 2003; Akuse et al., 2010), unauthorized dispensing of antibiotics, selling counterfeit drugs (Shah et al., 2011), rendering abortion and post-abortion care services (Onwujekwe et al., 2007; Titus et al., 2015; Adojutelegan et al., 2022). and Veillard et al. (2017) alluded to the observed sub-optimal quality of care provided by PMVs. PMVs are more abundant in numbers than all other healthcare worker cadres in most LMICs (Haddad et al., 1998), but there is a lack of granular data such as the spread of PMVs in the underserved or unreached hard-to-reach settings by the formal health system (Baltussen et al., 2002).

The ultimate value derivable from leveraging the PMVs to address HRH shortages in LMICs lies in how the dwellers of hard-to-reach communities perceive the quality of care provided by the PMVs. Perception of the quality of healthcare (Connelly et al., 1989; Stewart et al. 1992) and subjective perception of health status (Akin et al., 1999; Prach et al., 2015; Cremers at al., 2019) determine the utilization of healthcare services at primary care levels. Even in settings where the quality of healthcare is good, perceived quality sometimes contradicts the technical/observed quality (Hanefeld et al., 2017). Independent of access, poor quality can be a barrier to universal health coverage (Berendes et al., 2011). Perception of the quality of care often results from a combination of individual experiences, processed information and rumors (Adikwu, 1996), and is often largely based on experiences outside clinical settings (Brown, 1993). Hanefeld et al. (2017) established that the influence of perception on quality of care sometimes goes

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beyond the individual who experienced the healthcare; it influences the health-seeking decisions of their relatives. Adikwu (1996) noted that the economic, cultural, and spatial advantage possessed by PMVs is sometimes neutralized by the sub-optimal technical quality of the healthcare services they provide and the widespread regulatory infractions.

Despite being a better predictor of utilization of healthcare than the observed/technical quality (Arije, 2016), the perceived quality of healthcare provided by the PMVs in hard-to-reach communities has not been sufficiently-researched in LMICs. Our review of the literature did not find any study report on the perceived quality of care provided by PMVs in hard-to-reach settings in LMICs. This study, therefore, through the lens of hard-to-reach communities in Nigeria seeks to assess the perception of the quality of healthcare provided by PMVs as well as its determinants. The findings will offer some additional perspectives on the real potential in leveraging the PMVs to improve health outcomes for the most deprived sub-populations-rural and remote communities in LMICs.

METHODOLOGY

Study design

This is a cross-sectional study of residents of rural and remote villages in Jigawa state, the state with the largest concentration of rural communities in the north-western region of Nigeria. Jigawa state is inhabited by about 7 million people (Nigeria National Population Commission, 2020) who are predominantly Hausa or Fulani by origin, Agrarian (by occupation) and majorly speaking the Kanuri language. Jigawa has 23 local government areas with 85 to 90% of its population estimated to reside in rural communities (Aliyu et al., 2013). According to the report on the health workforce assessment conducted in 2020, Jigawa has a doctor-to-patient ratio of 1:54,293 far higher than the national average (1:3,500) and the world health organization recommendation of 1:600. The state has a grossly inadequate 1,100 nurses and midwives. The enumeration of PMVs carried out in 2020 showed that there are 2,471 PMVs in the state, of which 650 are skilled healthcare providers.

Sample size

A sample size (277) was calculated using the formula in the equation (Cochrane, 1977; Charan and Biswas, 2013) but a total of 339 households participated in the study due to operational convenience and rounding the up expected number of interviews across the stages of sampling.

Minimum sample size n= $D_{eff} \times \frac{Z^2 P(1-P)}{d^2}$ = 277 head of households (1)

where Z = Z-score corresponding to the level of statistical significance desired (0.05) = 1.96, P= Proportion of women who reported that PMVs treated them well at their last encounter in Kaduna state = 0.90 (Prach et al., 2015), d = Desired level of precision= 0.05, and D_{eff} = Design effect= 2.0.

Sampling method

A multi-stage sampling approach was used to select the 339 heads of households who participated in the study. The 27 local government areas (LGAs) in Jigawa State (using a list of communities designated as rural, remote, or hard to reach by the Local health authorities) were ranked in descending order of the concentration of populations estimated to be underserved by the public health system they contained. The five LGAs representing the top 30% were purposively selected. We then selected 20 hard-to-reach communities using a systematic random sampling method with the probability of selection proportional to the relative presence of the underserved population. Households were thereafter selected from the 20 sampled communities using systematic random sampling (with probability proportional to size) in the selected settlements. Households were listed in the selected communities and respondents were interviewed from households selected through systematic random sampling.

Data collection tool and procedure:

Twelve trained research assistants used a structured questionnaire that was digitized on the KOBO toolbox (an open-source data collection platform) to collect data from the heads of selected households. The questionnaire elicited responses on the personal and household profiles of the respondents as well as their perception regarding the quality of healthcare services provided by the patent medicine vendors. The perception of residents of rural and remote communities on the quality of care provided by the patent medicine vendors was measured with the Lay People's Perception of the Quality of primary healthcare services in developing countries questionnaire developed by Haddad et al. (1998) and re-validated by Hamid et al. (2021). The questionnaire is a 20-item Likert-like scale that measures the perception of quality of care through three constructs: healthcare delivery (5 items), health personnel (8 items), and health facilities (7 items). The questionnaire recorded a Cronbach alpha coefficient of 0.93 in this present study.

Data analysis

Data were imported into the Stata v16.0 (StataCorp, 2019; https://www.stata.com/). The primary outcome variable in this study was the perceived quality of care score. This represents the total score computed from the study participant's responses to the 20-item questionnaire on the Lay people's perception of the quality of healthcare provided by PMVs. We assessed the normality of the perception scores with the Shapiro-Wilk test which revealed that the outcome variable is skewed ($W=0.89$, $p<0.001$).

To summarize categorical variables (educational status, marital status, tribe, employment status, presence of pregnant women or under-5 in household, type of abode, and health insurance status) we calculated frequencies and percentages. In line with their non-parabolic distribution, the continuous variables (age, household size and the perception scores) were summarized with median, and Inter-quartile range. The relationship between continuous variables (age, household size) and the perceived quality of care (perception scores) was assessed using Spearman Rank Correlation.

Mann-Whitney U test was employed to investigate the relationship between perception scores and dichotomous categorical variables (sex, presence of under-5 in household, presence of pregnant women in household, health insurance status). To ascertain the relationship between perception scores and independent variables with three or more categories (education level, marital status, tribe, type of abode), we used Kruskal Wallis test. Level of statistical significance was set at $P<0.05$. The decision rule was such that

Table 1. Sociodemographic profile of respondents.

Characteristics	Frequency (%)
Sex	
Male	228 (67.3)
Female	111 (32.7)
Age (years), Median=35, IQR=17	
18-24	46 (13.6)
25-34	111 (32.7)
35-44	96 (28.3)
45-54	43 (12.7)
54-64	25 (7.4)
65+	18 (5.3)
Highest Level of education	
None	42 (12.4)
Qur'anic	31 (9.1)
Primary	230 (67.9)
Secondary	30 (8.8)
Tertiary	6 (1.8)
Employment status	
Unemployed	55 (16.2)
Employed	284 (83.8)
Tribe	
Hausa	137 (40.4)
Fulani	47 (34.8)
Kanuri	84 (24.8)
Marital status	
Married	313 (92.3)
Single	26 (7.7)
Total	339 (51.0)

Source: Author (2022).

whenever the calculated P-value is less than 0.05, we reject the null hypothesis and uphold the alternate hypothesis. Non-parametric Kernel regression test was thereafter employed to identify the predictors of perceived quality of care provided by PMVs.

Ethical approval

The ethics review committee of the Jigawa State Ministry of Health approved the protocol for the study on the 11 January, 2022, with the approval number: MOH/SEC/I. S/651/V1.

RESULTS

Respondents' characteristics

In total, 339 heads of households participated in the study (Table 1). Most of the respondents were Male (67.3%) with a median age of 35 years (interquartile range=17). More than two-thirds (67.9%) of the respondents had only completed a primary level of education at the time of the survey, 61.4% were farmers and 40% were from the Hausa tribe.

Household profile of respondents

More than half (56.7%) of the 665 households represented in the study had 10 or fewer members (Table 2). Most households (90.8%) reside in family ancestral homes and less than one-fifth possess a means of mobility (17.4%) and have community health insurance coverage (17.7%). Less than half (43.8%) of the households had a member who was pregnant at survey time while most (92.9%) had at least one child under 5 years old.

Preferred sources of healthcare in rural and remote communities

More than half of the respondents (65%) indicated patent medicine vendor is the preferred point of care for members of their household (Figure 1). Only a quarter of the selected households prefer to receive care at government hospitals/clinics while 5% prefer to receive healthcare from traditional healers and herb sellers.

Perception of residents of rural and remote communities on the quality of care provided by PMVs

The perception of residents of rural and remote communities on the quality of care provided by the patent medicine vendors was measured with the *Lay People's Perception of the Quality of primary healthcare services in developing countries questionnaire* developed by Haddad et al. (1998) and re-validated by Hamid et al. (2021). The median score for the perception of quality of care received at patent medicine vendors was 63 out of the 100 maximum obtainable score (Table 3). The perception of quality-of-care scores among the respondents ranged from 19 to 76.

Correlates of perceived quality of care provided by PMV in rural and remote communities

This study found that the respondents' age, sex, educational level, tribe of heads of households, household size, presence of child(ren) under-5 and health insurance cover have statistically significant relationship with the perception of the residents of rural and remote community dwellers on the quality of healthcare services provided by the patent medicine vendors.

Table 2. Household characteristics of respondents.

Characteristics	Frequency (%)
Household Size (Median:9, IQR:5)	
1-10	212 (62.5)
11-20	113 (33.3)
≥21	14 (4.2)
Type of Abode	
Family Ancestral home	324 (95.6)
Rented residence	4 (1.2)
Make-shift shelter	11 (3.2)
Ownership of a Means of transport	
Yes	87 (25.7)
No	252 (74.3)
Pregnant Member	
Yes	135 (39.8)
No	204 (60.2)
Child Under-5 Member	
Yes	316 (93.2)
No	23 (6.8)
Health insurance Cover	
Yes	41 (12.1)
No	298 (87.9)
Total	339 (100)

Source: Author (2022).

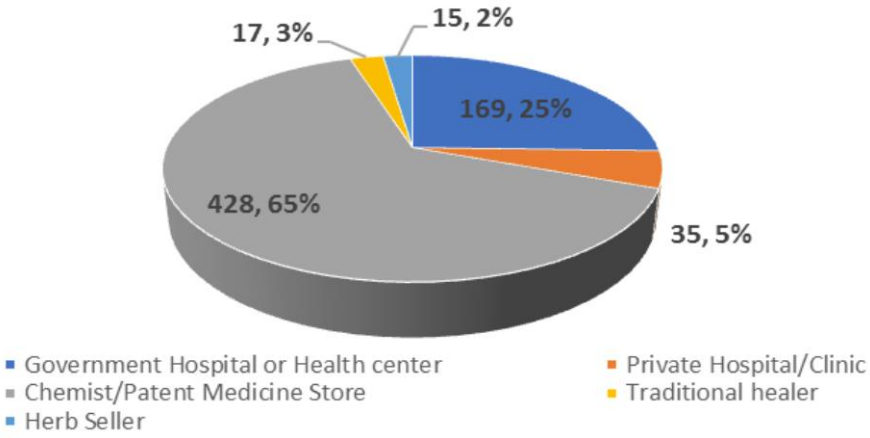

Figure 1. Preferred sources of healthcare in rural and remote communities.
Source: Author (2022).

Predictors of perception of quality of care provided by PMVs in rural and remote communities

The results (Table 5) show that residents of hard-to-reach communities with secondary or tertiary education who had health insurance cover were at least 5 times more positive on the perception of the quality of care provided by the PMVs compared to those with no formal education

Table 3. Description of respondents' perception of the quality-of-care score.

Variable	Total Score Obtainable	Minimum	Median	Maximum	Inter-Quartile Range
Health care delivery	25	5	15	20	5
Personnel	40	8	23	32	9
Facility	35	6	19	24	5
Overall perception score*	100	19	63.00	76	17

Source: Author (2022).

that are uninsured (P<0.05).

DISCUSSION

This study assessed the perception of dwellers of rural and remote communities on the quality of healthcare provided by PMVs as well as its determinants. The study found that, on the average, respondents rated the quality of care provided by PMVs at 63 out of 100 possible points. This is consistent with the report of in their systematic review of the roles of PMV in the provision of primary healthcare in Nigeria. The report highlighted the popularity of the concerns about the quality of care provided by PMVs and adduced it to the fact that many of the PMVs often provide services beyond their legal scope of practice and stock expired or substandard drugs.

It was found that almost two-thirds of the respondents indicated PMVs as their preferred source of healthcare. This finding is consistent with reports of previous studies that PMVs often receive high patronage in rural and remote communities (Brown et al., 1993; Marriott, 2009; Kruk, 2018) typically not because they perceived good quality care (Mashego and Peltzer, 2005) but because they are often the closest (Uzondu et al., 2015) or the only available point of healthcare in the underserved communities (Ali et al.,2012) Owumi and Raji (2013) explained that, where other informal healthcare providers are the alternative options, choices on where to receive care become explicit and patients make trade-offs between these alternatives. This implies that if the perception of poor quality of care is not addressed, the rural and remote dwellers may also consider healthcare from other unregulated informal health sector alternatives that may be available in their domain (Duku, 2018).

This study found (Table 4) a statistically significant relationship between perceived quality and age, sex, education, tribe, presence of under-5 in household and household size. In general, research has shown that people from different socio-demographic backgrounds have different experiences, expectations, and evaluations of the healthcare system (Beyrer et al., 2012) and the quality of care they receive (Arije, 2016). For example, Devoe et al. (2009) and Vasilios (2010) reported that people's age plays significant role in how they perceive the quality of care received. Age was a one of the criteria for enrolling residents of underserved into social health insurance scheme in the communities where our study was conducted. Age was not also significantly associated with perception score in the multivariate analysis. Therefore, rather than being a predictor, age appears to play a mediating role between perceived quality of care and health insurance status in this study. We infer those other variables (like sex, Household size, presence of under-5 and tribe) which were not statistically significant in the multivariate test may be playing similar moderating effects between perception of quality scores and other attributes of the respondents. The fact that a given factor can play different roles in different settings underscores the need for evidence-based contextualization of public health interventions to promote greater success.

The finding in this study that those not covered by health insurance had more negative perception of the quality of care offered by PMV signals that if nothing is done to address the root cause(s) of the negative perception, the PMV may not significantly improve access to health in these rural and remote villages.

Secondary and post-secondary level education was also associated with positive perception of quality of care in this study. This result could be due to better understanding of the mandates and limitations of the PMVs by the more educated individuals, compared to those with no formal education, who may be expecting the same or similar standards of care available in conventional health system from the PMVs. This limited understanding among the non-literate residents may not be unconnected with inappropriate communication mechanisms that are solely delivered in English language and not local dialects in the rural communities. If PMVs will make any substantial contribution to improving access to healthcare in rural communities, communication messages that assures the residents of rural and remote communities of receiving optimal quality care from PMVs need to be co-created with them (the non-literates) and disseminated in appropriate local dialects.

Conclusion

This study highlights that while many dwellers of rural and remote communities receive healthcare services from PMVs, they perceive the quality of care they receive

Table 4. Association between Respondents' Characteristics and Perceptions on the quality of care provided by Patent Medicine Vendors.

Characteristics	Median Perception Score	Number of Respondents (n)	Statistic	P-value
Age	63.0	339	0.156[a]	0.0039*
Sex				
Male	64.5	228	3.162[b]	0.0016*
Female	60.0	111		
Educational Level				
None	61.5	42		
Quranic	61.0	230		
Primary	70.0	31	17.310[c]	0.0018*
Secondary	71.5	30		
Tertiary	71.0	6		
Tribe				
Hausa	70.0	136		
Fulani	58.5	118	30.570[c]	0.0001*
Kanuri	62.5	85		
Marital Status				
Married	63.0	313	1.160[b]	0.2460
Single	61.5	26		
Household Size	63.0	339	0.1286[a]	0.0178*
Type of Abode				
Family Ancestral home	63.0	324		
Rented residence	76.0	4	3.941[c]	0.1394
Make-shift shelter	58.0	11		
Have pregnant women in HH				
Yes	64.0	135	1.079[b]	0.2808
No	63.0	190		
Child(ren) Under-5 in HH				
Yes	63.0	41	2.473b	0.0134*
No	56.0	298		
Health insurance Cover				
Yes	69.0	41	2.290	0.0220*
No	62.0	298		
All respondents	63.0	339		

*Statistically significant, [a]Spearman Rank Correlation, [b] Mann-Whitney U test, [c] Kruskal Wallis test.
Source: Author (2022)

to be suboptimal. This could potentially limit the success of the any expansion of more basic health services to the PMVs in rural and remote communities as the differences in perception can negatively impact on uptake healthcare, continuity of care, and consequently health outcomes. We recommend further in-depth understanding of how and why educational level and health insurance status predict the perception of rural and remote community dwellers. Integrating this contextual knowledge into the design and implementation of interventions for expanding healthcare access and improving the quality of care available to dwellers of rural and remote communities

Table 5. Determinants of perceived quality of healthcare provided by PMVs.

Variable	Estimated Effect (95% CI)	P-value
Age	**0.093 (-0.093– 0.312**	**0.303**
Sex		
Female	1.113(-1.964 – 3.739)	0.420
Male	1.000 (Ref)	-
Education		
Qur'anic	0.901 (-1.306 – 3.096)	0.400
Primary	3.541 (-1.383 – 7.202)	0.079
Secondary	6.432 (-0.532 – 9.962)	0.028*
Tertiary	7.623 (-2.309 – 8.361	0.046*
No formal	1.000 (Ref)	
Household Size	**0.258 (-0.228 – 0.807)**	**0.249**
Presence of Children Under-5		
Yes	1.987 (-3.829 – 7.789)	0.510
No	1.000 (Ref)	-
Tribe		
Fulani	-0.913 (-2.224 – 0.380)	0.183
Kanuri and others	-1.336 (-3.461 – 0.477)	0.242
Hausa	1.000 (Ref)	0.190
Insured		
Yes	5.664 (2.712-8.692)	0.000*
No	1.000 (Ref)	-

*Statistically significant.
Source: Author (2022).

could improve their health outcomes.

LIMITATION

The study, due to inherent limitations of the cross-sectional study design, could not establish a cause-and-effect relationship between the characteristics of rural and remote community dwellers and their perceived quality of healthcare PMVs provide. However, it offers unique perspectives on how the dwellers of remote settlements in a typical LMIC perceive the quality of healthcare they receive from PMVs.

This study also provides timely evidence that could spur further conversations on the factors to consider in the ongoing efforts to expand basic health service provision to PMVs in Nigeria and other sub-Saharan African countries.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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