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THE HOUSEHOLD FACTORS THAT FACILITATE THE UPTAKE OF COMMUNITY BASED HEALTH INSURANCE FOR MATERNAL HEALTHCARE SERVICES UTILIZATION IN KARISIMBI HEALTH ZONE, NORTH-KIVU, DRC

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ABSTRACT

This study focuses on the influence of CBHI on the use of maternal health services in the Karisimbi health zone. It was carried out by collecting data from the households of women who were members or non-members of CBHI and who gave birth during 2021, in order to gather information on how CBHI does or does not influence their use of maternal health services during pregnancy, during childbirth and after childbirth. The choice of study was motivated by the fact that, in general, previous studies have revealed that the use of maternal health services by breastfeeding women who are members or non-members of the CBHI is low in the DR Congo, with the demographic consequence of increasing maternal morbidity and infant mortality. This situation is exacerbated in both semi-rural and urban areas, as other obstacles to access to maternal health services include cultural, religious or family limitations, lack of knowledge of CBHI principles, low levels of education among the population, and rumors and misinformation about the benefits and consequences of joining a CBHI. Thus, the level of education significantly influenced the adoption of CBHI for the use of maternal services, with the highest rate of adherence recorded among those with full secondary education (41%). However, service use was higher among BFHI members with lower levels of education than among non-members. Marital status was also a significant predictor of utilization of ANC, delivery and CBHI ANC services. Utilization of delivery and ANC services was slightly higher among married and divorced women in the CBHI group than among their counterparts in the non-member group. The results of the analysis indicate a significant relationship between socio-economic status, i.e. monthly income and source of income, and CBHI use of maternal services. BFHI use was higher among those with high socioeconomic status and lower among those with low socioeconomic status. On the other hand, use of maternal health services decreased as socioeconomic status increased.

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INTRODUCTION

Improving maternal health remains a major public health concern. The importance attached to this subject is motivated by the frequency and severity of illnesses suffered by the mother during pregnancy and the child after delivery, and the high rates of maternal and infant mortality in some countries. Indeed, around 303,000 women worldwide died in 2015 from preventable complications related to pregnancy or childbirth, 99% of which occurred in developing countries (1). According to the World Health Organization, Democratic Republic of Congo is among the group of countries that have made progress in improving maternal health as part of the 5th Millennium Development Goal.

Indeed, the maternal mortality ratio fell from 332 to 112 per 100,000 live births in 2010, a reduction of 66% compared with 1992 (3). These efforts have also led to improvements in other maternal health indicators. The proportion of births attended by a skilled attendant has risen steadily to 74%. The increase in this proportion parallels the rise in the proportion of women having had a consultation with qualified personnel, which rose to 77.1% over the same period. In addition, 21.9% of women received qualified postnatal consultations (4). Encouraged by this progress, Morocco adjusted its maternal mortality reduction target from 112 to 50 deaths per 100,000 live births for the year 2016 as part of the plan to accelerate the reduction of maternal mortality for the period 2012-2016 (5). As part of its efforts to accelerate the decline, the Kingdom has signed up to the Sustainable

Development Goals (SDGs), a roadmap launched in New York in 2015, which aims to reduce the global maternal mortality ratio to below 70 per 100,000 live births between 2016 and 2030 (6). Despite these efforts, inequities persist in access to obstetric and neonatal care for CBHI and non-member women between areas of residence, regions, provinces and socioeconomic levels. In 2011, the maternal mortality rate in rural areas was twice as high as in urban areas (148 versus 73 deaths per 100,000 live births), and the proportion of deliveries by CBHI and non-CBHI women in a supervised environment did not exceed 55% among rural women. As for antenatal care, 62.7% of women were monitored during the same year, and only 13.6% of rural women consulted a doctor in the post-partum period (7). The use of obstetric care services is one of the key factors promoting better health for mothers and their children (8). Indeed, a 2011 meta-analysis of 13 studies showed a 23% reduction in stillbirths when CBHI women delivered with skilled personnel (9). Nevertheless, health care services in many developing countries are often under-utilized (10), and a large number of women continue to give birth in poor sanitary conditions, particularly in rural areas (11). Determinants of under-utilization of maternal health services include non-membership of a CBHI, poverty, distance, lack of information, inadequate services and cultural practices. Accordingly, the literature indicates that the analysis of household determinants among breastfeeding women who are members or non-members of CBHIs is extremely important for the implementation of reliable policies and strategies for each community, but also to ensure effective use of maternal health care services (12). With this in mind, and with the aim of better developing interventions to optimize maternal health, we conducted this study to understand whether the population of breastfeeding women in the Karisimbi health zone uses the maternal health services available, and also to highlight the factors determining this use of maternal health services in this health zone.

METHODOLOGY

This study was a retrospective case-control study of breastfeeding women who were members or non-members of CBHI and who had given birth during the year 2021. 804 women participated by visiting the households of those in our sample. Data on socio-economic characteristics, level of knowledge, access to and membership of CBHI were collected. However, selection was based on a number of predefined inclusion criteria, including being a resident of the Karisimbi health zone, being of childbearing age (15-49), having given birth during the year 2021, and being a member of one of the CBHIs operating in the Karisimbi health zone. The exclusion criteria were that the household or the nursing mother was absent on the day of the interview. In the household, data collection was carried out with the respondent's consent, and interviews were conducted in the respondent's language. The interviewers were Community Relays, who knew the environment well, and the interviewees carried out the data collection in the focus groups.

FINDINGS AND DISCUSSIONS

Influence of Socio-demographic Factors on uptake of CBHI for ANC Services use

Results show socio-demographic factors that influence uptake of CBHI for ANC services utilization. Education level, marital status, income source and monthly income of the participants were significantly associated with uptake of CBHI for ANC services utilization. However, age of the participant, ethnicity and household size had no significant influence on uptake of CBHI for ANC service use. Education level of the participant significantly influenced uptake of CBHI ($p=0.001$). The highest CBHI membership was recorded among participants with secondary complete level of education 41%. However, membership among lowly educated participants, i.e., no education (8%), primary complete (6%), primary incomplete (21%), was slightly higher than non-membership (6%, 5%, 10% respectively), while membership among highly educated participants;

i.e., secondary incomplete (16%), secondary complete (41%) was lower than non-membership (22%, 51% respectively). Both CBHI and non CBHI groups showed proportional decline in the uptake of ANC due to increasing education levels. However, uptake was higher among CBHIS members of primary incomplete (81%), primary complete (90%) and secondary incomplete (87%) compared to their counterparts in the non CBHIS group (70%, 64% 9% respectively). Surprisingly, all women of university level and no education among the non CBHIS group and their CBHIS group counterparts recorded 0% utilization. Marital status of an individual was also a significant predictor of uptake of CBHI for ANC services utilization (P -value=0.001). Women who were divorced (16%), and widowed (17%) were highly identified among CBHI members than among non-members (8%, 12% respectively) while married women were highly identified among non-members (70%) than among members (48%). However, married women recorded the highest CBHI membership. Uptake of ANC services was somewhat higher among the single and the married women than among the divorced and separated in both groups. However, by comparison group, more divorced (9%) and the widowed (14%) CBHIS members, utilized ANC services compared divorced (0%) and widowed (0%) non-CBHI members. With regards to socio-economic status, our results show that source of income and monthly household income had significant influence on uptake of CBHI for ANC services utilization by women ($p=0.034$, 0.002 respectively). In terms of source of income, CBHI membership was highly recorded among people whose source of income was monthly salaries (39%) and lowly recorded among people whose source of income was cattle (9%). Uptake of ANC services was higher among CBHIS members whose source of income was small businesses (100%), crafting (100%), farming (100%), and monthly salaries (44%) than among their non-member counterparts (77%, 0%, 0%, 0% respectively). All women who derived their income from cattle in both groups did not use ANC services. With regards to monthly household income, uptake of CBHI was low among people with lower monthly incomes of less than \$50 (9%) but high among people with moderately higher incomes of; \$60-\$100 (44%) and \$101-\$500 (36%). There was a relative decline in the utilization of ANC services in both groups as monthly income increased. However, it was higher among CBHIS members with a monthly income of less than \$50 (100%), \$60 - \$120 (100%), and \$101 - \$500 (43%) than among non-members with the equivalent monthly incomes (42%, 0%, 0% respectively). Interestingly, none of the women with more than \$501 monthly income in both groups utilized ANC services. There was a strong association between monthly income of an individual and uptake of CBHI for ANC services use ($p=0.002$).

Influence of Socio-demographic Factors on uptake of CBHI for Use of Delivery Services:

Sociodemographic factors that significantly influenced uptake of CBHI for use of delivery services were age, marital status, income source and monthly household income. Education level, ethnicity and household size were not found to have significant influence on uptake of CBHI for use of delivery services. As stated above, age of a participant significantly influenced uptake of CBHI for delivery service use. ($p=0.04$). The highest CBHI membership was among women between the age of 26 and 35 years (59%), but declined as age increased. For instance, membership among younger women of age; 15-25 years (16%) 26-35 years (59%) was higher than non-membership (15%, 3% respectively) while membership among older women; 36-45 years (21%), 46-49 years (4%) was lower than non-membership (33%, 49% respectively). A proportional decline in utilization of delivery services was also recorded in both groups due to age increase. In both groups, all women between the age of 15 and 25 years used delivery services. However, uptake was lower among CBHIS members of ages 26-35 years (42%), 36-45 years (0%), and 46-49 years (0%) compared to non-members within the same age groups (100%, 35%, 6% respectively). Marital status was found to have a strong association with the uptake of CBHI for delivery services utilization ($p<0.001$). With regards to utilization of delivery services by comparison group, a considerably higher percentage of married CBHI women (45%) used delivery services compared to their non-member counterparts (11%).

Table 2. Influence of Socio-demographic Factors on uptake of CBHI for Use of Delivery Services

Modalities	Member						No-Member						Fisher's statistics	df	P-Values
	Total	% total	Yes	%	No	%	Total	% total	Yes	%	No	%			
Age													78.43	3	0.04
From 15 to 25 years old	66	16%	66	100%	0	0%	62	15%	62	100%	0	0%			
26 to 35 years old	236	59%	98	42%	138	58%	12	3%	12	100%	0	0%			
From 36 to 45 years old	84	21%	0	0%	84	100%	133	33%	46	35%	87	65%			
46 to 49 years old	16	4%	0	0%	16	100%	195	49%	11	6%	184	94%			
Total	402						402								
Level of education													13.73	5	0.51
Primary complete	30	7%	30	100%	0	0%	22	5%	22	100%	0	0%			
Primary incomplete	84	21%	84	100%	0	0%	40	10%	40	100%	0	0%			
Secondary complete	164	41%	162	99%	2	1%	204	51%	18	9%	186	91%			
Secondary incomplete	64	16%	0	0%	64	100%	90	22%	0	0%	90	100%			
University	26	6%	0	0%	26	100%	22	5%	0	0%	22	100%			
Did not study	34	8%	0	0%	34	100%	24	6%	0	0%	24	100%			
Total	402						402								
Ethnicity													13.6	4	0.41
Nande	148	37%	148	100%	0	0%	102	25%	74	73%	28	27%			
Hunde	72	18%	16	22%	56	78%	56	14%	0	0%	56	100%			
Nyanga	82	20%	0	0%	82	100%	94	23%	0	0%	94	100%			
Shi	64	16%	0	0%	64	100%	124	31%	0	0%	124	100%			
Rega	36	9%	0	0%	36	100%	26	6%	0	0%	26	100%			
Total	402						402								
Marital status													58.02	3	<0.001
Single	76	19%	76	100%	0	0%	42	10%	42	100%	0	0%			
Married	194	48%	88	45%	106	55%	280	70%	32	11%	248	89%			
Divorced	64	16%	0	0%	64	100%	32	8%	0	0%	32	100%			
Widow(er)	68	17%	0	0%	68	100%	48	12%	0	0%	48	100%			
Total	402						402								
Income source													121.2	4	0.02
Small business	64	16%	64	100%	0	0%	104	26%	80	77%	24	23%			
Farmer	58	14%	58	100%	0	0%	86	21%	0	0%	86	100%			
Craftsman	84	21%	84	100%	0	0%	94	23%	0	0%	94	100%			
Monthly salary	158	39%	70	44%	88	56%	62	15%	0	0%	62	100%			
Cattle	38	9%	0	0%	38	100%	56	14%	0	0%	56	100%			
Total	402						402								
Monthly income													46.71	3	<0.001
Less than \$50	36	9%	36	100%	0	0%	190	47%	74	39%	116	61%			
Between \$60 and \$100	178	44%	128	72%	50	28%	92	23%	0	0%	92	100%			
Between \$101 and \$500	144	36%	0	0%	144	100%	110	27%	0	0%	110	100%			
More than \$501	44	11%	0	0%	44	100%	10	2%	0	0%	10	100%			
Total	402						402								
Household size													197.4	2	0.95
2 to 4 persons	82	20%	82	100%	0	0%	60	15%	60	100%	0	0%			
5 to 7 people	196	49%	82	42%	114	58%	148	37%	14	9%	134	91%			
More than 8 people	124	31%	0	0%	124	100%	194	48%	0	0%	194	100%			
Total	402						402								

On the other hand, none of the divorced and widowed women in both groups utilized delivery services while all the single women (100%) in both groups did. In terms of source of income, utilization of delivery services was extremely high among CBHI members who derived their income from small businesses (100%), crafting (100%), farming (100%), and monthly salary (44%) than among their equals in the non-member group (77%, 0%, 0% respectively). Income source was significantly associated with uptake of CBHI for delivery service utilization ($p=0.02$). Monthly household income also had a significant influence on the uptake of CBHI for delivery service utilization ($p<0.001$). Utilization drastically declined as monthly income increased. By comparison group, uptake was higher among CBHI members with lower monthly incomes of less than \$50 (100%), and \$60 - \$120 (77%) than among their non-member counterparts (39%, 0% respectively). There was no use of delivery services among women with a monthly income of more than \$101 in both groups.

Influence of socio-demographic characteristics on uptake of CBHI for postnatal service use: The results below show that participants' education level, marital status, and monthly income significantly influenced uptake of CBHI for postnatal services utilization. Their age, ethnicity, income source and household size were not significant predictors. There was a strong relationship between education and uptake of CBHI for use of postnatal services as presented in the table below ($p=0.001$). Both groups showed a decrease in the uptake of PNC services as education levels increased. All participants with primary complete, and primary incomplete level of education in both groups utilized PNC services. However, uptake was higher among CBHI members with secondary complete education (30%) compared to their counterparts in the non-CBHIS group (6%). None of the participants with no education, secondary incomplete, and university level in both groups utilized PNC service. In terms of marital status, uptake of PNC services was higher among CBHI members who were married (100%), and divorced (9%) than among their counterparts in the non-member group (14%, 0% respectively). All single women in both groups used PNC services while none of the widowed in both groups did. Marital status was a significant predictor of uptake of CBHI for PNC service utilization ($p=0.001$). With regards to socio-economic status, monthly income was significantly associated with uptake of CBHI for PNC service use ($p=0.012$). Utilization of PNC services decreased as monthly income increased in both groups.

DISCUSSIONS AND CONCLUSION

The results from this study established a significant association between some of these factors and uptake of CBHI for ANC, Delivery, and PNC services utilization. Education level of participants in our study had significant influence on uptake of CBHI for ANC and PNC services utilization. The highest CBHI membership enrollment was of mothers with secondary level of education. However, women with low education standing and those with university level, recorded higher CBHI membership than non-membership. Our findings are somewhat consistent with findings from a study which reported a positive association between higher education and the likelihood to enroll for CBHI (Chankova *et al.*, 2008a). Another study in Burkina Faso also found a positive relationship between formal education and CBHI enrollment (Cofie *et al.*, 2013). In terms of maternal service utilization, utilization was high among lowly educated women and low among highly educated women. However, there was no utilization of these services among uneducated women. This finding could be partly explained by the limited, or lack of access to knowledge among uneducated women. Highly educated women could have access to information and knowledge but might but might fail apply, thus resulting in underutilization of such services. This result is inconsistent with results from studies which have reported a high likelihood of ANC and PNC service utilization among women with higher levels of education (Tarekegn *et al.*, 2014) (Rai *et al.*, 2013). Essentially, formal education exposes women to a modern society which increases their awareness on modern medical interventions making them more responsive to these services compared to uneducated women (Azeze

& Huang, 2014). Therefore, enhancing maternal health education amongst women during ANC visits, and follow-ups could help sustain groups with low uptake due to predisposed factors like low education. Marital status in our study was strongly associated with uptake of CBHI for use of ANC, Delivery, and PNC services. CBHI membership was high among married women. However, compared to their non-member counterparts, few married women were enrolled. Furthermore, membership among the single, divorced and widowed women was highly recorded than non-membership. These results are somewhat consistent with findings from a cross-sectional study in Ghana which found a strong positive correlation between uptake of insurance and marital status. Married women were the most likely to enroll for insurance followed by divorced and single women (Badu *et al.*, 2018). Another study in India also reported high CBHI enrollment among married women (Panda *et al.*, 2014a). Utilization of ANC, Delivery, and PNC services was substantially high among single women in both groups. This could be due to limited maternal healthcare knowledge and experience among younger women, who in this case, were the single women. This agrees with findings from a study in Ethiopia which reported that younger women highly utilized maternal services than older women (Worku *et al.*, 2013a). It is however inconsistent with findings from a study in Sudan which revealed non-use of ANC to be significantly higher among married women of childbearing age than among unmarried women (Mugo *et al.*, 2015).

Numerous studies have converged to ascertain the influence of socio-economic status of households on uptake of CBHI. Our study revealed low CBHI enrollment for utilization of ANC, Delivery and PNC services among participants with low monthly income, but high enrollment among participants with relatively high monthly income. This is probably because people with higher monthly incomes can easily afford to pay for CBHI premiums unlike those with lower incomes. These results agree with findings from a study which reported a positive correlation between high household incomes and CBHI uptake (Dror *et al.*, 2016). However, a study in India found a negative association between household monthly income and CBHI enrollment (Panda *et al.*, 2014a). There is need by the government and stakeholders to come up with strategies like funding the needy who cannot afford CBHI premiums to avoid exclusion of the underprivileged persons. Utilization of ANC, Delivery and PNC services reduced as monthly income increased in this study. This is inconsistent with findings from a study by Yang *et al.*, which found out that women with higher socio-economic status were more likely to utilize maternal health services than those with lower socio-economic status (Yoshida & Sakamoto, 2010). Additionally, utilization was low among participants whose source of income was monthly salaries and cattle compared to those whose source of income was farming, crafting, and small business. These findings corroborate findings from a study in Ethiopia which reported that communities involved in both trading and farming were highly likely to use these services than those who just farmed (Worku *et al.*, 2013b).

In our study, age was significantly associated with uptake of CBHI for delivery services utilization. Younger women were highly enrolled for CBHI than older women. This contradicts with evidence from other studies which reported high CBHI membership among older women than younger women (Chankova *et al.*, 2008) (Gnawali *et al.*, 2009). Other studies have however found age to have no significant influence of CBHI uptake (Panda *et al.*, 2014b). Utilization of delivery services declined comparatively with increase in age. This can be attributed to the change in women's experience over time. It has been argued that younger women or first-time mothers are more likely to seek institutional delivery services than women with multiple births (Fekede & G Mariam, 2007). This study did not find ethnicity and household size to have a significant influence on uptake of CBHI for utilization of both ANC, Delivery, and PNC services. Some studies have however found household size and ethnicity to be the strongest determinants of uptake of CBHI for maternal health services (Onwujekwe *et al.*, 2010) (Oriakhi & Onemolease, 2017). Nonetheless, there was a significant difference in

membership across ethnic groups. This contrast can be attributed to different level of awareness of CBHI among ethnic groups, where some regions or ethnic groups may be more exposed to CBHI public campaigns than others (Smith & Sulzbach, 2008). There was also a notable difference in membership among different household sizes. Household that constituted 5-7 people recorded the highest membership. A study in Tanzania reported that households with more members were more likely to enroll for CBHI (Kuwawenaruwa *et al.*, 2012). In this study, the results show that CBHIs do influence the use of maternal health services by breastfeeding women in the Karisimbi health zone, according to the factors highlighted above, which showed a significant influence.

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