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Original Article

Determinants of Timely Healthcare-Seeking Behaviour and Knowledge of Childhood Danger Signs in Caregivers of Children Below Five Years Attending Gita Sub-County Hospital, Kisumu, Kenya

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ABSTRACT

Morbidity and mortality in children below five years are still relatively high even after many interventions, especially and low and middle-income countries. Many of the deaths are due to preventable causes. Timely seeking of healthcare from qualified personnel as soon as the child shows signs and symptoms of disease is a game changer, especially to the treatment outcomes. However, this is determined by various factors including the caregiver's age and knowledge about childhood illnesses, including danger signs. This cross-sectional study aimed to investigate the determinants of timely healthcare-seeking behaviour and knowledge of danger signs in caregivers of children below five years attending Gita Sub-County Hospital in Kisumu, Kenya. Systematic sampling was used to include 324 caregivers in the study. Using structured pretested interview-guided questionnaires, data was collected, cleaned and analysed using into GraphPad Prism 10.2.0 (392). The mean age of the participants was 28.38 years. Knowledge about childhood danger signs in children by their caregivers was poor (35%). Age (31-40 and 41-50 years at [AOR=1.32(95%CI: 0.77-1.87) and AOR=1.29(95%CI: 0.76-1.82)] respectively), secondary [AOR=1.34(95%CI: 1.14-1.54)] and tertiary education [AOR=2.07(95%CI: 0.8-3.33)]), formal employment [AOR=1.62(95%CI: 1.31-1.92)] and no source of income [AOR=1.75(95%CI: 0.61-2.89)] improved caregivers' knowledge about danger signs in children. Timely healthcare seeking for sick children was low (25%). Age (≤ 20 years [AOR=3.89 (95%CI: 2.43-5.34)]), marital status (divorced/separated, single and widowed caregivers [AOR=2.55(95%CI: 0.91-4.18), AOR=2.46(95%CI: 1.67-3.24) and AOR=2.41(95%CI: 1.92-2.89) respectively]), source of income (formally employed and self-employed [(AOR=2.9(95%CI: 2.45-3.34) and AOR=2.42(95%CI: 1.89-2.92)] were promotors of timely healthcare seeking. Caregivers need to be sensitized about danger signs in their children and the need to seek timely healthcare once their children present with any one of the danger signs.

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INTRODUCTION

According to UNICEF data, there were 2.4 billion children in the world aged between 0 to 14 years in 2017. This number is expected to peak up to approximately 2.06 million by 2050 and decline to 1.9 billion by 2100 (UN, 2022). Of these, close to 656 million are under 5 years (UN, 2022). Child mortality rates have been on the decline globally. In Kenya, the mortality rate for children under five years decreased from 102 to 43 deaths per 1,000 live births in 1990 and 2019 respectively (UNICEF Kenya, 2024). Approximately, 64,500 children die annually before their fifth birthday, mostly due to preventable causes (UNICEF Kenya, 2024). With the various efforts put towards reducing child mortality, this figure is still too high. Infectious diseases including acute respiratory infections, diarrhoea and malaria are the leading causes of childhood mortality, especially in developing countries (WHO, 2024). There exists a rural-urban gap of infant mortality in various countries (Kumar et al., 2022; Yaya et al., 2019). Disadvantages in household and community characteristics, environmental factors, poverty and maternal education and age are important contributors (Van Poel & Van Doorslaer, 2009; Saikia et al., 2013). Investing in the poorest children saves twice as many lives than equal investments made in less deprived groups (UNICEF, 2016). In addition to strengthening maternal and child health (MCH) programs in rural areas, increasing female education levels has been linked to reducing the rural-urban gap in child mortality and overall household health (Yaya et al., 2019).

In most African settings, females take over the responsibility of taking care of the home, and ensuring that all members of the household are well taken care of (Okolo & Mwachukwu, 2022). They keep the home habitable, nurture their children and prepare daily meals for their households. They therefore take up a pivotal role in ensuring members of the household are free from health scares (Goodwin et al., 2005). Even when the scares occur, they are responsible for ensuring the timely seeking of healthcare and are the primary caregivers for their children, although the father and other members of the extended family may also contribute (Hatch & Posel, 2018). Therefore, maternal physical and

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emotional well-being, coupled with knowledge of various aspects of health translates into better health outcomes for members of their households, especially children below five years who may solely depend on it (Mudiyanselage et al., 2024).

Indeed, maternal education is associated with increased odds of optimal care-seeking for fever, diarrhoea and acute respiratory infections in their children (Adeoti & Cavallaro, 2022). No 'threshold' level of maternal education can be reached for its benefits to be realized concerning child health, since even slight improvements in maternal levels of education greatly improves child health (Nafista et al., 2023). The mother's/caregiver's ability to identify when the child is sick and timely seek healthcare from qualified healthcare personnel is a game changer in determining the treatment outcomes (Duke et al., 2020). Delays in first response lead to the progression of the illness, longer hospital stays even in those that survive (Garcia et al., 2024) and a higher financial burden to already strained families and communities (Kraft et al., 2009). The first point of seeking of care is also as important since it could contribute to the delay. Seeking of care from unqualified personnel greatly contributes to delay (Yaya et al., 2021) and could lead to mortality especially when danger signs are present in the child. Therefore, timely healthcare seeking behaviour is the obtaining of professional attention aimed at treatment of the child within 24 hours of onset of signs and symptoms.

According to WHO and UNICEF's Integrated Management of Childhood Diseases, a child with any one of the general danger signs including not able to drink or breastfeed, vomiting everything, has convulsions and is lethargic or unconscious is in serious trouble and therefore needs urgent referral to a health facility (WHO & UNICEF, 2005). This is because such children need urgent lifesaving treatment like oxygen therapy, intravenous antibiotics and other forms of medical care that may not be available anywhere else (UNICEF Kenya, 2024). However, in addition to the above danger signs, the Kenya Integrated Management of Childhood Illnesses has also included high fever, diarrhoea and/or bloody stool, fast/difficulty in breathing and yellowing of the body (skin and eyes) in children (Ministry of Health, 2021).

Knowledge of these danger signs differs among mothers and caregivers depending on various factors. Age, maternal education and marital status, source of income and previous experience of danger signs are some of these factors (Degefa et al., 2018). Put together, these factors also affect healthcare-seeking behaviour. Therefore, the objectives of our study were;

- To identify the level of knowledge of childhood danger signs and its determinants in children below five years attending Gita Subcounty Hospital
- To identify the determinants of timely healthcare-seeking behaviour for children below five years attending Gita Sub-County Hospital

MATERIALS AND METHODS

Study Area and Design

The study was cross-sectional and was carried out in Gita Sub-County Hospital, which is found in Gita Sub-County, Kisumu County, Kenya.

Sample Size and Sampling Procedures

The study population consisted of caregivers who brought their sick children to Gita Sub-County Hospital for treatment. Inclusion criteria was for all caregivers of children below five years attending the Hospital and consented to the study. Caregivers who did not consent, had participated in the pretesting and those whose children were too sick and disturbed to be subjected to long interviews were excluded from the study. A total of 324 caregivers were enrolled in the study.

Data Collection Instruments

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A structured questionnaire was developed and pretested on 20 caregivers attending the same facility three months earlier. An assistant was trained to administer the questionnaire to those who qualified to be included in the study. Every third caregiver who attended the health facility with their child was interviewed. The data collected was screened for completion of the questionnaire and those that had parts unanswered (4) were not included in the final data analysis.

General danger signs in children used were a combination of the WHO recommendations (WHO & UNICEF, 2005) and Mother and Child Health Handbook, Revised Edition (Ministry of Health [Kenya], 2016). These include not being able to drink or breastfeed, vomiting everything, convulsions and lethargic or unconsciousness (WHO), fever (hotness of the body), fast breathing and/or difficulty in breathing, diarrhoea (associated with blood or poor fluid intake) and yellowness of the palms and soles.

Knowledge of danger signs in children was considered if the caregiver mentioned the following number of general dangers sign out of 7; Very good knowledge 6-7, Good knowledge 4-5, Average knowledge 3, Poor knowledge 2, Very poor knowledge 1, & No knowledge at all 0

Data Analysis

The data obtained was manually entered into Microsoft Excel and later exported into GraphPad Prism 10.2.0 (392) for analysis. Descriptive statistics were analysed using percentages. Relationships between the various variables including socio-demographic data and knowledge of danger signs on timely healthcare-seeking behaviour were determined by multiple logistic regression analysis at 95% confidence intervals and p-value ≤ 0.05 was considered statistically significant. An anticipated non-response rate of 10% was considered.

Ethical Approval

Ethical approval to carry out the study was given by the Ethical Review Board of Jaramogi Oginga Odinga Teaching and Referral Hospital. Permission was also obtained from the Medical Superintendent of Gita Sub-County Hospital. Consent was obtained from the participants in any one of the three languages (Luo, Kiswahili, and English) depending on which they preferred. After agreeing to participate in the study, the participants signed the consent form.

RESULTS

Demographic Data

Three hundred and twenty-four caregivers consented to the study. Out of these, four opted out. Of the caregivers who completed the questionnaire, the majority 195 (61%) were between 21-30 years old, followed by those between 31-40; 65(20%), and those 41-50, ≥ 50, and ≤ 20 were 38(12%), 12(4%) and 10(3) respectively. The mean age of the participants was 28.38 years.

Most of the caregivers were married 236(74%) with some of them 6(2%) coming with their spouses. Single, widowed and divorced/separated caregivers were 57(18%),18(6%) and 9(3%). The majority of the caregivers had had primary education or more. Only 3 caregivers (1%) had not had any formal education at all and 32(10%) had received tertiary school education, while 153(48%) and 132(41%) had secondary and primary education respectively.

One hundred and seventeen 117(37%) caregivers were self-employed with many carrying out retail trade. Others, 103(32%) lacked any source of income and had to rely on the income of their spouses and other relatives for their survival and that of their children. Additionally, 51(16%) had resorted to being casual labourers whereas caregivers with formal employment accounted for 49, which was only 15% of the study participants.

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Table 1: Demographic data of the caregivers

Variable		Frequency	Percentage
Age groups	≤20	10	3
	21-30	195	61
	31-40	65	20
	41-50	38	12
	≥50	12	4
	Total	320	100
Marital status	Married	236	74
	Single	57	18
	Divorced/separated	9	3
	Widowed	18	6
	Total	320	100
Education	No formal education	3	1
	Primary education	132	41
	Secondary education	153	48
	Tertiary education	32	10
	Total	320	100
Source of income	None	103	32
	Self-employed	117	37
	Casual labourer	51	16
	Employed	49	15
	Total	320	100

Knowledge of Signs and Symptoms of Common Childhood Illnesses

Most caregivers recognized when their child was sick, with hotness of the body (85), not being playful (71), unable to feed (56), difficulty breathing (46), irritability (33), the child reporting that they are sick/unwell (20). vomiting (21), cough (18), lethargy (18), weakness (18) and others including diarrhoea (15), sleeping a lot (12), tired (9), unhappiness (5), red eyes (4), dizziness (2) and pain (1).

Table 2: How caregivers know their child is sick

Signs child is sick	Frequency of mention	Percentage
Hotness of body	85	20
Not playful	71	16
Unable to feed	56	13
Difficulty breathing	46	11
Irritability	33	8
Vomiting	21	5
Child reports feeling unwell	20	5
Weakness	18	4
Lethargic	18	4
Cough	17	4
Diarrhoea	15	3
Sleeping a lot	12	3
Tired	9	2
Unhappy	5	1

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Signs child is sick	Frequency of mention	Percentage
Red eyes	4	1
Dizziness	2	0
Pain	1	0
Total	**433**	**100**

Knowledge of Danger Signs

In order to investigate the caregivers' level of knowledge on childhood illness, and if this may affect their healthcare-seeking behaviour, their knowledge of danger signs in children was assessed. Of the 320 respondents, 118(37%) had some knowledge about them, 45(14%) did not have any knowledge and 157 (49%) were not sure. Fever was mentioned most frequently at 87(20%). This was followed by vomiting and seizures, convulsions or unresponsiveness at 74(17%) and 66(15%) respectively. Diarrhoea and/or bloody stool 64(15), not (breast)feeding 59(14), fast / difficulty breathing 51(12) and yellowing of the body (skin and eyes) 35(8).

The 118 caregivers were asked to list as many danger signs in children as they could to assess their level of knowledge about danger signs in children, which depended on how many danger signs they could correctly list. The majority, 64(54%) had average knowledge of danger signs, 38(32%) having above-average knowledge (*Table 3*).

Table 3: Frequency of mention and knowledge of danger signs

		Frequency	Percentage
Danger sign	Hotness of body	87	20
	Vomiting	74	17
	Seizures, convulsions or unresponsive	66	15
	Diarrheal and/or bloody stool	64	15
	Not (breast)feeding	59	14
	Fast / difficulty breathing	51	12
	Yellowing of the body (skin and eyes)	35	8
	Total	436	100
Level of knowledge	Very good knowledge	13	11
	Good knowledge	25	21
	Average knowledge	64	54
	Poor knowledge	12	10
	Very poor knowledge	4	3
	No knowledge at all	0	0
	Total	118	100

Healthcare-Seeking Behaviour of the Caregivers

Healthcare-seeking behaviour was determined by the time taken for the caregivers to intervene once they noticed the child was sick and where they would seek healthcare.

Timely healthcare-seeking behaviour was 25% (table 4). The time taken to seek for medical intervention greatly differed and mostly depended on the presenting signs and symptoms and time of the day at 183(57%) and 35(11%). However, some caregivers 69(22%) sought healthcare immediately after they noticed the child was sick. Major signs that caregivers thought required immediate intervention included fever, unable to (breast) feed, convulsions, vomiting and diarrhoea depending on the severity. Whereas less diarrhoea and vomiting, cough, red eyes pain, tiredness, not being playful and unhappiness were mentioned as those that did

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not require immediate attention but close monitoring of their progression (table 6).

Of the places where the caregivers would seek attention first upon realizing their child is sick, the majority of the caregivers 112(35%) mentioned Gita SCH and other nearby health facilities, 48(15%) would use over-the-counter medicine, 4(1%) would visit the herbalists and 1(0.3%) would seek for help from the Community Health Volunteer. The majority of them 155(48%) would seek for care from any of the above depending on the signs the child presents with.

Table 4: Time taken to seek health care and first point of contact once the child is sick

		Frequency	Percentage
Time	Immediately	69	22
	Less than 24 hours	9	3
	A few days	22	7
	Depends on day and time	35	11
	A week	2	1
	Depends on presenting symptoms	183	57
	Total	320	100
First point of contact	Health facility	112	35
	Herbalist	4	1
	CHV	1	0.3
	Over the counter	48	15
	Depends on the sign	155	48
	Total	320	100

Determinants of Knowledge of Danger Signs and Timely Healthcare Seeking

Results of multiple logistic regression analyses on knowledge of danger signs show that caregivers between 31-40 and 41- 50 years were [AOR=1.32(95%CI: 0.77-1.87)] and [AOR=1.29(95%CI: 0.76-1.82)] times more knowledgeable about danger signs respectively. Additionally, caregivers who have tertiary education had [AOR=2.07(95%CI: 0.8-3.33)] times more knowledge about danger signs compared to those who had only primary education. Divorced/separated, widowed and single caregivers were less likely to know of danger signs in their children [AOR=0.51(95%CI: 0.24-0.78)], [AOR=0.75(95%CI: 0.11-1.38)] and [AOR=0.81(95%CI: 0.35-1.27)] respectively. The source of income of the caregivers was a determinant of the likeliness of knowledge about danger signs. For example, caregivers with no source of income were [AOR=1.75(95%CI: 0.61-2.89) times more likely to know about danger signs, followed by those who are employed [AOR=1.62(95%CI: 1.31-1.92)]. Self-employed caregivers were slightly less likely [AOR=0.91(95%CI: 0.49-1.33)] to know about danger signs.

In respect to timely health-care-seeking behaviour, caregivers of less than 20 years of age were [AOR=3.89 (95%CI: 2.43-5.34)] and 31-40 [AOR=1.73 (95%CI: 1.23-2.22)] times more likely to take their children to the health facilities on time. Those between 41-50 years were least likely at [AOR=0.61 (95%CI: 0.34-0.88)] to seek timely care. Additionally, divorced/separated, single and widowed caregivers were twice as likely to seek timely care at [AOR=2.55(95%CI: 0.91-4.18)], [AOR=2.46(95%CI: 1.67-3.24)] and [AOR=2.41(95%CI: 1.92-2.89)] respectively. Formally employed and self-employed caregivers were also twice more likely [AOR=2.9(95%CI: 2.45-3.34)] and [AOR=2.42(95%CI: 1.89-2.92)] respectively to seek timely care for their children, whereas none employed caregivers were

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[AOR=0.85(95%CI: 0.76-0.94)] less likely to seek care on time. For the level of education, caregivers with a secondary school level of education were least likely to seek timely care [AOR=0.77(95%CI: 0.21-1.32)], with those that have no formal education [AOR=1.56(95%CI: 1.11-2)01] and tertiary education [AOR=2.52(95%CI: 1.82-3.21)] more likely (*Table 5*).

Table 5: Multivariate logistic regression analysis results of the factors that are associated with knowledge of danger signs and timely healthcare seeking in caregivers of children below five years attending Gita Sub-County Hospital

Caregivers' characteristics		Knowledge of danger signs AOR (95% CI)	Timely health care seeking AOR (95% CI)
Age	≤20	1.05 (0.98-1.12)	(3.89) 2.43-5.34*
	21-30	1.0	1.0
	31-40	1.32 (0.77-1.87)	(1.73) 1.23-2.22
	41-50	1.29 (0.76-1.82)	(0.61) 0.34-0.88
	>50	1.07 (1.02-1.11)	(1.09) 0.52-1.65
Marital status	Married	1.0	1.0
	Single	(0.81) 0.35-1.27	(2.46) 1.67-3.24
	Divorced/separated	(0.51) 0.24-0.78	(2.55) 0.91-4.18
	Widowed	(0.75) 0.11-1.38	(2.41) 1.92-2.89
Education	No formal education	(1.23) 0.65-1.84	(1.56) 1.11-2.01
	Primary education	1.0	1.0
	Secondary education	(1.34) 1.14-1.54	(0.77) 0.21-1.32
	Tertiary education	(2.07) 0.8-3.33	(2.52) 1.82-3.21
Source of income	None	(1.75) 0.61-2.89	(0.85) 0.76-0.94
	Self-employed	(0.91) 0.49-1.33	(2.41) 1.89-2.92
	Casual labourer	1.0	1.0
	Formally employed	(1.62) 1.31-1.92	(2.9) 2.45-3.34

p≤0.05 statistically significant

DISCUSSION

Timely healthcare-seeking behaviour by caregivers is an important factor in reducing morbidity and mortality in children. Various factors including the age of the caregivers, marital status, level of education, source of income and knowledge of childhood illnesses directly or indirectly affect caregivers' timely healthcare seeking for their children (Negatou et al., 2021). In this study, the age of the caregivers determined their knowledge of danger signs with those below 20 years seeking healthcare timely compared to those between 41-50 years. This could be attributed to the fewer responsibilities young caregivers have in their families and communities compared to older ones and the fear of particular signs and symptoms in their children due to inexperience. This is in agreement with Ogunlesi and Olanrewaju (2010) who also determined that being a young caregiver for children improves healthcare-seeking behaviour since older mothers are too confident and have overcome similar experiences (Ogunlesi & Olanrewaju, 2010).

However, in a case-control study carried out in central Ethiopia on under-five children with diarrheal diseases, younger mothers (15-25 years) delayed healthcare seeking for their children compared to older ones (26-35 years) (Zhou et al., 2022). This could be because younger caregivers are more likely to lack resources that promote timely care like income and decision-making abilities (Degefa et al., 2018).

Age also determined the level of knowledge a caregiver had about danger signs in their children. That is, caregivers between 31- 50 years were more

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knowledgeable about danger signs compared the younger and older caregivers. This is due to the relatively high literacy rates of these caregivers, coupled with more exposure to childhood illnesses. These results concur with those of Zhou et al., (2022), who determined that a maternal age of less than 25 years was associated with relatively poor knowledge of neonatal danger signs in mothers of children aged between 0-12 months (Zhou et al., 2022). Older age has also been associated with a better understanding and sufficient knowledge about pneumonia in caregivers of children with pneumonia in Migori County (Burton et al., 2011).

According to this study, divorced/separated, single and widowed caregivers sought timely care better compared to their married counterparts. However, the latter were more knowledgeable about danger signs. This shows that being both married and knowing danger signs are factors that deter timely healthcare-seeking. This is however the opposite of the results of studies carried out in caregivers of children with acute childhood illnesses admitted in Kenyatta National Hospital (Wambui et al., 2018) and in rural Uganda (Kajungu et al., 2023) which determined that being married was associated with immediate healthcare-seeking behaviour. Many of the caregivers preferred taking their children to health facilities especially Gita Subcounty Hospital because of its close proximity, no matter the signs the child presents with. This could be attributed to the timely care and free medical services provided for children below 5 years. However, the majority could use any option of care including the health facility, herbal medicine or over-the-counter medicine depending on the signs and symptoms in their child.

Fever, difficulty in breathing, convulsions and seizures, and vomiting were most associated with seeking timely care in the health facilities. This is because caregivers associated these danger signs with disease severity and unpredictable outcomes and concurs with Lungu et al. (2020) who showed that health care seeking was better when fever was the presenting symptom. Care seeking for diarrhoea and poor feeding/breastfeeding was delayed and if sought, herbal medicine and over-the-counter drugs were preferred. However, in a different study, diarrhoea and vomiting were the danger signs that led to timely healthcare seeking in neonates (Gyaase et al., 2024).

The source of income for the caregiver also determines the knowledge about childhood illnesses and the seeking of timely care. Casual labourers and self-employed caregivers had less knowledge. Their busy schedules in searching for financial resources, could limit timely healthcare and knowledge-seeking for their children. Many caregivers in these groups also did not have an education or reached only a primary level of education. Formally employed and self-employed caregivers were twice as likely to seek timely compared to casual labourers. This could be because casual labourers are paid only after doing the job. Thus, missing work to take their children for healthcare meant missing a daily wage. However, non-employed caregivers were less likely to seek timely care, yet they were among the most knowledgeable groups about danger signs. This implies that many factors, aside from the knowledge of danger signs come into play to determine the timely seeking of healthcare i.e. knowledge alone may not translate into the timely seeking of healthcare, similar to results of Rutebemberwa et al. (2009).

In this study, however much caregivers knew about the signs and symptoms that their child is sick, their knowledge about danger signs was limited. Only 37% of them knew about danger signs, 86% of these having had either average or above average knowledge about danger signs in children. The percentage was determined to be higher (44.7%) in mothers of under-five in Central Tigrai, Ethiopia (Gebreslasie et al., 2020). On the other hand, only 25% of mothers sought timely healthcare for their children. This is very low compared to the results of a 2011 study carried out in various rural areas of Kenya that obtained 48% hospital healthcare-

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seeking behaviour (Burton et al., 2011). However, it's in agreement with Abegaz et al. (2019) who established that 26.5% of mothers/caregivers sought healthcare for their children timely (Abegaz et al., 2019).

In the urban slums of Malawi, only 8% of caregivers sought healthcare timely (Lungu et al., 2020). WHO recommends immediate healthcare seeking for children with any one of the danger signs (WHO & UNICEF, 2005). According to the Kenya Integrated Case Management for Children below 5 years, immediate referral should be obtained when any danger sign is detected in the child. Timely healthcare seeking is thus a game changer. Therefore, the fact that the majority of the caregivers only had to visit a health facility as an option and turning to self-prescribed herbal medicine and over-the-counter medicine was worrying, even when free services and medication were available in health facilities. Even when timely care is sought, its provision by qualified health personnel is of equal importance. When it is sought from herbalists or through self-prescribed over-the-counter medication, like most participants in the study, its advantages are not achieved. These findings are important indicators of the complexity of healthcare-seeking behaviour and the need to integrate various players in its improvement.

CONCLUSION

In conclusion, caregivers of children below 5 years attending Gita Subcounty Hospital have both poor knowledge of childhood danger signs and poor healthcare-seeking behaviour. Age (generally above 30 years), level of education (secondary and tertiary education), and source of income (formal employment and none) were promoters of caregivers' knowledge of danger signs in children. Additionally, age, marital status (divorced/separated, single and widowed), and source of income (formally employed and self-employed) were the promotors of timely healthcare-seeking behaviour by the caregivers. There is a need to sensitize caregivers about the general danger signs in their children and how timely healthcare seeking from qualified health personnel is an important determinant of their children's health outcomes. Caregivers need to be encouraged to consider health facilities as the first point of care.

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