

Pre-Hospital Treatment of Children with Fever: Beliefs and Practices of Caregivers in Ado-Ekiti, South-West Nigeria

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ABSTRACT

BACKGROUND: Fever is a common complaint among children presenting in healthcare facilities worldwide, and its timely treatment can reduce the severity and consequences of childhood febrile diseases. This study set out to investigate the pre-hospital treatment of childhood fever in a semi-urban town in South-west Nigeria. The main objective was to assess the practice of pre-hospital treatment of fever among caregivers attending the children outpatients' clinic.

METHODS: A questionnaire-based descriptive cross-sectional study was conducted among 256 caregivers who brought their febrile wards to the children outpatients' clinic during the study period.

RESULTS: Two-hundred and fifty-six caregivers were interviewed during the study period. The median age of children in the study was 24 months, with males (154/60.2%) making up the majority. Caregivers checked for fever in their wards by touching (220/85.9%) and using a thermometer (28/10.9%). The majority (175/68.4%) of the caregivers had given the children one form of drug treatment before presenting at the teaching hospital. Before presenting at the hospital, the median time (delay) was two days, with most caregivers (105/59.3%) obtaining drugs from patent medicine stores. Common medications used in the pre-hospital treatment of fever by caregivers were paracetamol (172/51.8%), anti-malarial drugs (82/24.7%), antibiotics (49/14.8%) and vitamins (29/8.7%).

CONCLUSION: Pre-hospital treatment of fever was a common practice among respondents in this study. Education of caregivers on early recognition of common childhood febrile diseases and the institution of appropriate, timely home management should be incorporated into the care package for children presenting with febrile illnesses in Nigeria.

Keywords: Home Treatment, Fever, Children, Perception, Belief, Practice, Caregivers

INTRODUCTION

Fever is very a common complaint among children

presenting in healthcare facilities all over the world. It is a symptom of many childhood diseases such as malaria, respiratory tract infections and

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gastroenteritis, which are major causes of morbidity and mortality in many developing countries [1-3]. Timely treatment of febrile illnesses can reduce the severity and consequences of these diseases among children. This is especially very important in Africa, where access to affordable healthcare is a problem for a significant part of the populace [4,5]. Studies have also indicated that caregivers usually treat these medical conditions at home and other unorthodox places before presenting at the hospital, especially when there is no improvement [6]. Some of the reasons for this practice include the distance of healthcare facilities, the high cost of accessing care and the influence of cultural practices [7, 8].

Easy access to prescription medications in many developing countries plays a significant role in sustaining this practice. Studies have shown that this delay in presentation to healthcare facilities is associated with worse treatment outcomes in children. Given this reality, many programs, including Integrated Management of Childhood Illnesses (IMCI) and Home-based treatment of malaria, have been introduced to help improve outcomes [9,10]. Some other African countries have also integrated the treatment of pneumonia into the home treatment schedule. The benefits of these initiatives, especially home-based malaria management, have been demonstrated in many researches across Africa [11].

The knowledge of caregivers about possible causes and appropriate management of common childhood diseases manifesting with fever such as malaria has been shown to improve the outcomes of these conditions [12,13]. The right perception of the cause of diseases and appropriate home treatment strategies has also been cost-effective and reduces the disease's severity [14].

The impact of home-based malaria management has been studied in some African countries with varying results [15-19]. Though some studies have investigated the understanding and perception of caregivers regarding the home treatment of fever, it is a known fact that children are treated in many other places before presentation in the hospital. This study set out to investigate the pre-hospital treatment of childhood fever in a semi-urban town in South-west Nigeria, where home management of childhood fever is yet to be implemented. It is expected that the results of the study will be

a basis for future interventional studies in these communities. The study's main objective was to assess the practice of pre-hospital treatment of fever among caregivers attending the children's outpatients' clinic. Additionally, we set to explore the duration for which treatment was given, types of medications given and their sources.

METHODS

Study Setting: The study was conducted in the pediatric outpatient clinic of the Ekiti State University Teaching Hospital located in Ado-Ekiti, South-West Nigeria, between the 1st of January and 30th of April 2016. This hospital is a referral center that caters for the medical needs of people residing in Ado-Ekiti, the state capital and other surrounding communities. The pediatric outpatient's department is well staffed with its components of medical officers, registrars, consultants and nursing staff. It is usually the first port of call for children brought to the hospital. Patients who attended the clinic are either treated as outpatients or admitted for observation and admission to the pediatric wards.

Study type: A descriptive, cross-sectional and prospective study was conducted among caregivers who brought their wards to the children outpatients department during the study period.

Sampling procedure: The convenience sampling method was adopted for the purpose of this study. Caregivers of all children aged below 16 years who presented with a fever at the outpatients' clinic during the study period were approached to participate in the study.

Inclusion and Exclusion Criteria: Caregivers of all children presented with fever (Axillary Temperature > 37.5°C) were invited to participate in the study. The caregivers were re-assured that their non-participation in the study would not in any way affect the quality of care given to their child. Written informed consent was obtained from those who volunteered to participate. Excluded were those who did not give consent and those with very ill children/wards.

Study Instrument: A questionnaire was developed for the purpose of this study based on literature from similar studies on the pre-hospital treatment of fever among children in Africa [6-8,12]. The questionnaire consisted of bio-demographic data of caregivers and children, their knowledge about fever and its possible cause. Other information

requested in the questionnaire were the drugs used for treatment at home and their sources. The instrument was pre-tested among 15 subjects at a secondary level healthcare facility located in a neighboring town some 10 kilometers away. The necessary adjustments were made to the questionnaire based on the pretest before the questionnaires were administered.

Data collection: Two medical officers, in addition to the official English language, understood the local Yoruba language were trained to administer the questionnaires to caregivers. This was to ensure the correct translation of the questionnaire to the respondents. The principal investigator checked at random the completed questionnaire to ensure clarity and reliability of recorded data.

Sample size: The sampling frame was 1600 over the study period. The practice of pre-hospital treatment of fever was reported to be prevalent in 81%-89% in previous studies conducted in Nigeria [20-22]. Hence we chose a prevalence rate of 80% to calculate the sample size using the Raosoft® online sample calculator. Using the above prevalence rate and other assumptions, we obtained a sample size of 214. This was increased to 236 after the addition of potential attrition of 10%.

Statistical Analysis: Data were analyzed using SPSS (Statistical Package for Social Sciences) version 17 software. Results were expressed as means, frequencies and percentages. Chi-square was used to determine the level of significance of groups of categorical variables with P values <0.05 considered significant. Association between age group and educational level of caregivers and the practice of pre-hospital treatment was explored by univariate analysis.

Ethical Considerations: Only those who gave informed consent were recruited for the study. The investigators ensured that caregivers who did not give their consent still received the required standard of care for their children. Ethical approval

was obtained from the Ekiti State University Teaching Hospital Research Ethics Committee (EKSUTH/A67/2015/12/006) before the study's commencement.

RESULTS

Two-hundred and fifty-six caregivers were interviewed during the study period. The median age of children in the study was 24 months, with males (154/60.2%) making up the majority. The mean age of caregivers was 33.4 ±6.4 year, with those aged between 31-40 years (139/54.3%) making up the largest proportion. The largest group of patients were between 13 and 36 months of age (Table 1).

Table 1: Age stratification of children

Age group (Months)	Frequency (%)
1- 12	55 (21.5)
13- 36	149 (58.2)
37- 72	32 (12.5)
73- 156	16 (6.3)
> 156	4 (1.6)

The majority (179/ 69.9%) of the caregivers were educated up to tertiary institution level. The majority of the caregivers (175/68.4%) had given the children one form of treatment before presenting at the teaching hospital.

The median time (delay) before presenting at the hospital was two days. Only 191 respondents were sure of the onset of fever, with 97(50.8%), 61 (31.9%), 20 (10.5%) and 13 (6.8%) having fever for less than two days, 3-4 days, 5-7 days and more than seven days respectively. Tables 2 and 3 shows the modality used by caregivers for checking for temperature and identified associated symptoms. Among the caregivers, only 111 (43.4%) knew the

Table 2: Methods for checking the temperature

Methods used for checking the temperature	Frequency (%)
By touching the skin	220 (85.9)
Use of thermometer	28 (10.9%)
Use of clinical state of the child (i.e. inability to eat)	4 (1.6%)
By looking at the face	4 (1.6%)

probable cause of fever with malaria (80/31.3%), Pneumonia (6/2.4%), stress (6/2.4%) and teething (4/1.6%) being the identified causes.

Table 3: Associated symptoms in febrile illness identified by respondents

Symptom	Frequency (%)
Fever	107(41.8)
Vomiting	46 (18.0)
Catarrh	32 (12.5)
Prostration	14 (3.5)
Poor appetite	10 (3.9)
Others	20 (7.8)

**Others include: Skin rashes, Jaundice, Arthralgia, Irritability, Abdominal Pain*

Table 4 reveals the source/setting from which caregivers obtained some form of treatment for their wards.

The medications used in the pre-hospital treatment of fever by caregivers were paracetamol (172/51.8%), anti-malarial drugs (82/24.7%), antibiotics (49/14.8%) and vitamins (29/8.7%). Among the anti-malarial drugs, artemisinin-based combinations were administered in 89%, while chloroquine was used in 11% of cases. The fixed-dose combination of ampicillin and cloxacillin (Ampiclox®) was the most administered antibiotics (25/51%), followed by erythromycin (11/22.4%), metronidazole (7/14.3%), Amoxicillin (4/8.2%) and co-trimoxazole (2/4.1%).

Table 4: Sources of pre-hospital treatment of febrile illness

Sources	Frequency (%)
Medicines from patent medicine stores	105 (59.3)
Primary healthcare centers	34 (19.2)
Private healthcare facilities	16 (9.0)
Left-over medicines at home	18 (10.2)
Faith-based centers (Churches)	2 (1.1)
Traditional/ herbal practitioners	2 (1.1)

Five respondents (2%) had used various forms of herbal preparations for their wards before presenting at the hospital.

There were no significant associations between the age group of caregivers, educational level, and pre-hospital treatment practice using inferential statistics. The association between the age group of caregivers, their educational attainment and knowledge about the causes of fever was also not statistically significant.

DISCUSSION

This study showed that a significant number of caregivers had given their children one form of treatment before presenting at the hospital. This finding is consistent with many other studies on home treatment of fever across Africa [23-27]. Infants and toddlers were the most represented group of children in our study, giving credence to the well-known fact of high morbidity pattern among children aged below five years in developing countries.

The majority of the caregivers in this study checked for the presence of fever by touching the children. This non-objective method of assessment was also reported in studies conducted in other parts of Nigeria and Uganda [28,29]. In contrast, most of Europe's caregivers used thermometers to record the fever level in their children [30,31]. The sensitivity of using touch to assess body temperature has been investigated by some workers and has wide variability [32]. While the tactile method may be an easy way of determining whether a child has a fever, objective assessment with a thermometer is necessary to classify the level of pyrexia to be able to apply appropriate, timely intervention.

Symptoms and signs associated with fever by most caregivers who participated in this study were vomiting, catarrh and cough, poor appetite and prostration. These findings are consistent with results from similar studies conducted in many Sub-Saharan African countries [33,34]. The similarities in many febrile childhood diseases' symptomatology may confuse caregivers, especially when trying to know the illness's cause [1,35]. In our study, less than half of caregivers could hazard a guess regarding the cause of their children's

illness, with most relating it to malaria, respiratory tract infections, teething and immunization. This relatively poor knowledge among caregivers may contribute to correspondingly poor health-seeking behavior, as demonstrated in some related studies [36,37].

In this study, 68.4% of caregivers had administered some form of treatment before presenting at the hospital. An earlier study conducted in Ibadan, South-West Nigeria, reported 58.5% of children being treated at home for fever [38]. Friend-du-Preez et al., in a study conducted in South Africa, found that home treatment of fever was usually the first option, with over 63% using over-the-counter (OTC) drugs for fever [6]. Some factors that have been linked to home treatment of fever in developing countries include dwelling in rural areas, non-availability of healthcare facilities, high cost of treatment and influence of the male parent [7,8,11]. The average (median) time of treatment before presenting in the hospital was two days in this study, and this is similar to findings from an earlier cited study conducted in Tanzania [7]. Several other studies conducted in other developing countries also reported over 24 hours delays in hospital presentation with distance from the healthcare facility, economic status and dwelling in rural communities as determinants of this time-lapse [39,40].

Paracetamol for the symptomatic management of fever is common worldwide; hence, it was not surprising that the drug was the most frequently administered in this study. This finding is corroborated by results from related work carried out earlier in Nigeria, Morocco and Tanzania [41-43]. The non-steroidal anti-inflammatory drug, Ibuprofen, was not used for the pre-hospital treatment of fever among our cohort despite its reported effectiveness and safety profile in children [44]. This could be due to a lack of information about Ibuprofen's properties and the fear of caregivers' adverse effects. The administration of anti-malarial drugs by a significant proportion of caregivers was not surprising as this study was carried out in a malaria-endemic area. Research conducted among caregivers in Nigeria and other sub-Saharan African countries has shown malaria as the most perceived common cause of febrile illness [13,19,45]. Though the use of artemisinin-based combination therapy was encouraging in this study, the fact that chloroquine was administered

in about 11% of the children is worrisome. The use of drugs from the 4-aminoquinolone group (chloroquine) is still prevalent in many Sub-Saharan African countries despite the adoption of artemisinin-based combination therapy (ACT) almost a decade ago [46,47].

There is a need for concerted efforts by stakeholders to reverse this trend as it has the potential to worsen morbidity and mortality among children in malaria-endemic regions. The parents/caregivers involved with this practice were adequately counselled to desist from such in the future. The fixed-dose combination of ampicillin and cloxacillin (Ampiclox®) was the most frequently administered antibiotics in this study. A meta-analysis of 34 studies on household self-medication with antimicrobial by Ocan et al. reported extensive use of antibiotics, especially for respiratory infections and diarrhea [48]. Easy access to prescription medicines like antibiotics through patent medicine stores and open markets is a problem in many developing countries. It has been associated with consequences such as anti-microbial resistance and poor therapeutic outcomes [49-51].

The use of herbal preparations was reported in only a handful of caregivers; this may be due to the level of education of caregivers who participated in this study. However, we cannot rule out the under-reporting of herbal medications because of the doctors' fear of being reprimanded. Nonetheless, the fact that participants reported this practice might reflect their beliefs in herbal medication use. Hence, healthcare providers' need to continue to educate caregivers on the health dangers fraught with such practices. Expectedly, those caregivers involved in this study were adequately counselled against herbal medicines continued use on their wards in the future.

Patent medicines stores and local pharmacies were the sources of drugs used for the treatment of the children. Results from several studies from sub-Saharan Africa also corroborate this trend [23,47,52]. This emphasizes the importance of local drug stores in enhancing the health of their communities. This has been demonstrated in various interventional studies involving community-based management of febrile illnesses in many African countries [53].

The proper training of caregivers, especially mothers, on the proper interpretation of symptoms and appropriate treatment of common childhood diseases such as malaria and pneumonia has been

shown to improve the rational use of medicines and better outcomes of childhood diseases in the community [18,19]. Left-over medicines as a source of self-medication have also been reported in some other studies [48,54]. Potential dangers resulting from this practice include wrong treatment, use of expired medicines and incomplete dosing, leading to undertreatment.

This was a single-center study. Hence its results may not reflect the practice among caregivers residing in other parts of Nigeria. However, the study findings represent caregivers' practise in this region of Nigeria with implications for patients' outcome and rational use of medicines. There is also the chance that some of the caregivers' information may not be accurate to avoid being

reprimanded by the doctors. This issue was addressed by assuring the caregivers that the required information would help the doctors make the appropriate diagnosis and give the correct treatment to their wards.

CONCLUSION

Pre-hospital treatment of fever is a common practice among respondents in this study. Education of caregivers on recognizing common childhood febrile diseases and instituting appropriate, timely home management should be incorporated into the care package for children presenting with febrile illnesses in hospitals. Healthcare authorities should adopt this policy in this region of Nigeria.

REFERENCES

- [1] I. K. Ndu et al., "Danger Signs of Childhood Pneumonia: Caregiver Awareness and Care Seeking Behavior in a Developing Country," (in eng), *Int J Pediatr*, vol. 2015, p. 167261, 2015.
- [2] C. Mahende et al., "Aetiology of acute febrile episodes in children attending Korogwe District Hospital in north-eastern Tanzania," (in eng), *PLoS One*, vol. 9, no. 8, p. e104197, 2014.
- [3] R. E. Cibulskis et al., "Malaria: Global progress 2000 - 2015 and future challenges," (in eng), *Infect Dis Poverty*, vol. 5, no. 1, p. 61, 2016.
- [4] B. S. Uzochukwu, M. D. Ughasoro, E. Etiaba, C. Okwuosa, E. Envuladu, and O. E. Onwujekwe, "Health care financing in Nigeria: Implications for achieving universal health coverage," (in eng), *Niger J Clin Pract*, vol. 18, no. 4, pp. 437-44, Jul-Aug 2015.
- [5] I. Beogo, N. Huang, M. P. Gagnon, and D. D. Amendah, "Out-of-pocket expenditure and its determinants in the context of private healthcare sector expansion in sub-Saharan Africa urban cities: evidence from household survey in Ouagadougou, Burkina Faso," (in eng), *BMC Res Notes*, vol. 9, p. 34, 2016.
- [6] N. Friend-du Preez, N. Cameron, and P. Griffiths, ""So they believe that if the baby is sick you must give drugs..." The importance of medicines in health-seeking behaviour for childhood illnesses in urban South Africa," (in eng), *Soc Sci Med*, vol. 92, pp. 43-52, Sep 2013.
- [7] T. Kassile, R. Lokina, P. Mujinja, and B. P. Mmbando, "Determinants of delay in care seeking among children under five with fever in Dodoma region, central Tanzania: a cross-sectional study," (in eng), *Malar J*, vol. 13, p. 348, 2014.
- [8] O. S. Arulogun, J. D. Adeniyi, S. Asa, and C. A. Adegbenro, "Why actions for early treatment of febrile illnesses in children are delayed by caregivers," (in eng), *Int Q Community Health Educ*, vol. 32, no. 3, pp. 219-31, 2011.
- [9] C. J. Uneka, "Impact of home management of Plasmodium falciparum malaria on childhood malaria control in sub-Saharan Africa," (in eng), *Trop Biomed*, vol. 26, no. 2, pp. 182-99, Aug 2009.
- [10] T. Gera, D. Shah, P. Garner, M. Richardson, and H. S. Sachdev, "Integrated management of childhood illness (IMCI) strategy for children under five," (in eng), *Cochrane Database Syst Rev*, no. 6, p. Cd010123, 2016.
- [11] J. Nonvignon et al., "Treatment choices for fevers in children under-five years in a rural Ghanaian district," (in eng), *Malar J*, vol. 9, p. 188, 2010.
- [12] A. E. Orimadegun, O. K. Amodu, P. E. Olumese, and O. O. Omotade, "Early home treatment of childhood fevers with ineffective anti-malarials is deleterious in the outcome of severe malaria," (in eng), *Malar J*, vol. 7, p. 143, 2008.
- [13] A. Zoungrana, Y. J. Chou, and C. Pu, "Socioeconomic and environment determinants as predictors of severe malaria in children under 5 years of age admitted in two hospitals in Koudougou district, Burkina Faso: a cross sectional study," (in eng), *Acta Trop*, vol. 139, pp. 109-14, Nov 2014.
- [14] F. Matovu, A. Nanyiti, and E.

- Rutebemberwa, "Household health care-seeking costs: experiences from a randomized, controlled trial of community-based malaria and pneumonia treatment among under-fives in eastern Uganda," (in eng), *Malar J*, vol. 13, p. 222, 2014.
- [15] I. O. Ajayi, C. O. Falade, E. A. Bamgboye, A. M. Oduola, and O. O. Kale, "Assessment of a treatment guideline to improve home management of malaria in children in rural south-west Nigeria," (in eng), *Malar J*, vol. 7, p. 24, 2008.
- [16] O. O. Chirdan, A. I. Zoakah, and C. L. Ejemi, "Impact of health education on home treatment and prevention of malaria in Jengre, North Central Nigeria," (in eng), *Ann Afr Med*, vol. 7, no. 3, pp. 112-9, Sep 2008.
- [17] O. A. Idowu, C. F. Mafiana, I. J. Luwoye, and O. Adehanloye, "Perceptions and home management practices of malaria in some rural communities in Abeokuta, Nigeria," (in eng), *Travel Med Infect Dis*, vol. 6, no. 4, pp. 210-4, Jul 2008.
- [18] H. Hopkins, A. Talisuna, C. J. Whitty, and S. G. Staedke, "Impact of home-based management of malaria on health outcomes in Africa: a systematic review of the evidence," (in eng), *Malar J*, vol. 6, p. 134, 2007.
- [19] C. I. Okwundu, S. Nagpal, A. Musekiwa, and D. Sinclair, "Home- or community-based programmes for treating malaria," (in eng), *Cochrane Database Syst Rev*, no. 5, p. Cd009527, 2013.
- [20] B. Afolabi, W. R. Brieger, L. J. J. o. H. Salako, Population, and Nutrition, "Management of childhood febrile illness prior to clinic attendance in urban Nigeria," pp. 46-51, 2004.
- [21] I. Ajayi, C. J. A. j. o. m. Falade, and m. sciences, "Pre-hospital treatment of febrile illness in children attending the General Outpatients Clinic, University College Hospital, Ibadan, Nigeria," vol. 35, no. 1, pp. 85-91, 2006.
- [22] A. A. Olaogun, O. Ayandiran, O. A. Olasode, A. Adebayo, and F. J. A. J. o. R. H. Omokhodion, "Home management of childhood febrile illnesses in a rural community in Nigeria," vol. 13, no. 2, pp. 97-101, 2005.
- [23] T. O. Abuya, W. Mutemi, B. Karisa, S. A. Ochola, G. Fegan, and V. Marsh, "Use of over-the-counter malaria medicines in children and adults in three districts in Kenya: implications for private medicine retailer interventions," (in eng), *Malar J*, vol. 6, p. 57, 2007.
- [24] O. S. Adah et al., "Home treatment of malaria, amongst under fives presenting with fever in PHC facilities in Jos North LGA of Plateau State," (in eng), *Niger J Med*, vol. 18, no. 1, pp. 88-93, Jan-Mar 2009.
- [25] B. M. Afolabi, W. R. Brieger, and L. A. Salako, "Management of childhood febrile illness prior to clinic attendance in urban Nigeria," (in eng), *J Health Popul Nutr*, vol. 22, no. 1, pp. 46-51, Mar 2004.
- [26] I. O. Ajayi and C. O. Falade, "Pre-hospital treatment of febrile illness in children attending the General Outpatients Clinic, University College Hospital, Ibadan, Nigeria," (in eng), *Afr J Med Med Sci*, vol. 35, no. 1, pp. 85-91, Mar 2006.
- [27] T. H. Holtz et al., "Care seeking behaviour and treatment of febrile illness in children aged less than five years: a household survey in Blantyre District, Malawi," (in eng), *Trans R Soc Trop Med Hyg*, vol. 97, no. 5, pp. 491-7, Sep-Oct 2003.
- [28] E. O. Asekun-Olarinmoye, B. E. Egbewale, and F. O. Olajide, "Subjective assessment of childhood fever by mothers utilizing primary health care facilities in Osogbo, Osun State, Nigeria," (in eng), *Niger J Clin Pract*, vol. 12, no. 4, pp. 434-8, Dec 2009.
- [29] M. B. Abdulkadir, W. B. Johnson, and R. M. Ibraheem, "Validity and accuracy of maternal tactile assessment for fever in under-five children in north central Nigeria: a cross-sectional study," (in eng), *BMJ Open*, vol. 4, no. 10, p. e005776, 2014.
- [30] N. D. Cinar, I. Altun, S. Altinkaynak, and A. Walsh, "Turkish parents' management of childhood fever: a cross-sectional survey using the PFMS-TR," (in eng), *Australas Emerg Nurs J*, vol. 17, no. 1, pp. 3-10, Feb 2014.
- [31] M. Crocetti, N. Moghbeli, and J. Serwint, "Fever phobia revisited: have parental misconceptions about fever changed in 20 years?," (in eng), *Pediatrics*, vol. 107, no. 6, pp. 1241-6, Jun 2001.
- [32] C. L. Teng, C. J. Ng, H. Nik-Sherina, A. H. Zailinawati, and S. F. Tong, "The accuracy of mother's touch to detect fever in children: a systematic review," (in eng), *J Trop Pediatr*, vol. 54, no. 1, pp. 70-3, Feb 2008.
- [33] C. C. Ezechukwu, I. Egbuonu, and J. O. Chukwuka, "Drug treatment of common childhood symptoms in Nnewi: what mothers do?," (in eng), *Niger J Clin Pract*, vol. 8, no. 1, pp. 1-3, Jun 2005.
- [34] D. Tuhebwe, E. Tumushabe, E. Leontsini, and R. K. Wanyenze, "Pneumonia among children under five in Uganda: symptom recognition and actions taken by caretakers," (in eng), *Afr Health Sci*, vol. 14, no. 4, pp. 993-1000, Dec 2014.

- [35] V. L. Ewing et al., "Understanding Interpretations of and Responses to Childhood Fever in the Chikhwawa District of Malawi," (in eng), *PLoS One*, vol. 10, no. 6, p. e0125439, 2015.
- [36] A. S. Oyekale, "Assessment of Malawian mothers' malaria knowledge, healthcare preferences and timeliness of seeking fever treatments for children under five," (in eng), *Int J Environ Res Public Health*, vol. 12, no. 1, pp. 521-40, Jan 2015.
- [37] O. M. Oche and O. B. Onankpa, "Using women advocacy groups to enhance knowledge and home management of febrile convulsion amongst mothers in a rural community of Sokoto State, Nigeria," (in eng), *Pan Afr Med J*, vol. 14, p. 49, 2013.
- [38] C. O. Falade et al., "The influence of cultural perception of causation, complications, and severity of childhood malaria on determinants of treatment and preventive pathways," (in eng), *Int Q Community Health Educ*, vol. 24, no. 4, pp. 347-63, 2005.
- [39] M. M. Thandar, M. P. Kyaw, M. Jimba, and J. Yasuoka, "Caregivers' treatment-seeking behaviour for children under age five in malaria-endemic areas of rural Myanmar: a cross-sectional study," (in eng), *Malar J*, vol. 14, p. 1, 2015.
- [40] M. Romay-Barja et al., "Rural-Urban Differences in Household Treatment-Seeking Behaviour for Suspected Malaria in Children at Bata District, Equatorial Guinea," (in eng), *PLoS One*, vol. 10, no. 8, p. e0135887, 2015.
- [41] M. Rkain, I. Rkain, M. Safi, M. Kabiri, S. Ahid, and B. D. Benjelloun, "Knowledge and management of fever among Moroccan parents," (in eng), *East Mediterr Health J*, vol. 20, no. 6, pp. 397-402, Jun 2014.
- [42] H. A. Obu, J. M. Chinawa, A. C. Ubesie, C. B. Eke, and I. K. Ndu, "Paracetamol use (and/or misuse) in children in Enugu, South-East, Nigeria," (in eng), *BMC Pediatr*, vol. 12, p. 103, 2012.
- [43] J. Fadare, O. Olatunya, O. Oluwayemi, and O. Ogundare, "Drug prescribing pattern for under-fives in a paediatric clinic in South-Western Nigeria," (in eng), *Ethiop J Health Sci*, vol. 25, no. 1, pp. 73-8, Jan 2015.
- [44] M. de Martino and A. Chiarugi, "Recent Advances in Pediatric Use of Oral Paracetamol in Fever and Pain Management," (in eng), *Pain Ther*, vol. 4, no. 2, pp. 149-68, Dec 2015.
- [45] T. Tawiah et al., "Economic costs of fever to households in the middle belt of Ghana," (in eng), *Malar J*, vol. 15, p. 68, 2016.
- [46] D. S. Nsagha et al., "Knowledge and practices relating to malaria in a semi-urban area of Cameroon: choices and sources of anti-malarials, self-treatment and resistance," (in eng), *Pan Afr Med J*, vol. 9, p. 8, 2011.
- [47] E. Rutebemberwa, X. Nsabagasani, G. Pariyo, G. Tomson, S. Peterson, and K. Kallander, "Use of drugs, perceived drug efficacy and preferred providers for febrile children: implications for home management of fever," (in eng), *Malar J*, vol. 8, p. 131, 2009.
- [48] M. Ocan et al., "Household anti-microbial self-medication: a systematic review and meta-analysis of the burden, risk factors and outcomes in developing countries," (in eng), *BMC Public Health*, vol. 15, p. 742, 2015.
- [49] A. K. Mbonye et al., "Prescription for antibiotics at drug shops and strategies to improve quality of care and patient safety: a cross-sectional survey in the private sector in Uganda," (in eng), *BMJ Open*, vol. 6, no. 3, p. e010632, 2016.
- [50] V. Ciorba, A. Odone, L. Veronesi, C. Pasquarella, and C. Signorelli, "Antibiotic resistance as a major public health concern: epidemiology and economic impact," (in eng), *Ann Ig*, vol. 27, no. 3, pp. 562-79, May-Jun 2015.
- [51] S. Sirinavin and S. F. Dowell, "Anti-microbial resistance in countries with limited resources: unique challenges and limited alternatives," (in eng), *Semin Pediatr Infect Dis*, vol. 15, no. 2, pp. 94-8, Apr 2004.
- [52] H. D. Mazigo, H. M. Bushahu, B. R. Kidenya, E. E. Ambrose, M. Zinga, and J. Heukelbach, "Home treatments with antipyretics and anti-malarials given to underfives with fever in Mwanza, north-western Tanzania," (in eng), *Tanzan J Health Res*, vol. 13, no. 2, pp. 114-8, Apr 2011.
- [53] J. N. Kalyango et al., "Increased use of community medicine distributors and rational use of drugs in children less than five years of age in Uganda caused by integrated community case management of fever," (in eng), *Am J Trop Med Hyg*, vol. 87, no. 5 Suppl, pp. 36-45, Nov 2012.
- [54] K. Kallander, J. Nsungwa-Sabiiti, A. Balyeku, G. Pariyo, G. Tomson, and S. Peterson, "Home and community management of acute respiratory infections in children in eight Ugandan districts," (in eng), *Ann Trop Paediatr*, vol. 25, no. 4, pp. 283-91, Dec 2005.