

Research Article

Utilization of Adolescent-Friendly Health Services in Mathare Informal Settlement, Nairobi, Kenya: Cross-sectional Study

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Abstract

Adolescent-friendly health services are essential for addressing the unique health needs of young people, particularly in informal settlements where access to quality healthcare is often limited. This study examined the utilization of AFHS among adolescents in the Mathare informal settlement, Nairobi, Kenya, with a focus on socio-demographic characteristics, health system factors, and adolescents' perceptions of service quality. A cross-sectional study design was employed, utilizing a structured questionnaire administered to a randomly selected sample of adolescents aged 15-19 years. Descriptive statistics were used to summarize the data, while logistic regression identified factors associated with AFHS utilization. Results showed significant associations between adolescent education level ($\chi^2 = 4.54$, $p=0.033$), type of school attended ($\chi^2 = 24.05$, $p=0.001$), religion ($\chi^2 = 16.32$, $p=0.001$), parent's living status ($\chi^2 = 28.71$, $p=0.001$), and parent's occupation ($\chi^2 = 24.76$, $p=0.0001$), as well as father's (Fisher's exact $p=0.001$) and mother's education levels (Fisher's exact $p=0.001$) with AFHS utilization. Health system factors, including waiting time (Fisher's exact $p=0.049$) and staff communication ($\chi^2 = 63.22$, $p=0.0001$), were also significantly associated with AFHS use. Additionally, the opportunity to ask questions in nearby health facilities was linked to higher utilization ($\chi^2 = 20.42$, $p=0.0001$). Perceived health risks among adolescents were significantly associated with AFHS use (Fisher's exact = 0.004). Key barriers identified included limited accessibility, insufficient healthcare worker training, and concerns about confidentiality. The findings underscore the need for targeted interventions, comprehensive policies by the MOH, improved resource allocation, and specialized training for healthcare workers. The study recommends the use of mobile clinics, awareness campaigns, and peer education programs to enhance service utilization. Collaborative efforts between AFHS centers, community leaders, schools, and youth organizations are essential for improving access and addressing socio-economic barriers in informal settlement

Keywords

Adolescent Health Services, Informal Settlements, Socio-Demographic Factors, Health System Barriers, Perception of Health Risks, Service Utilization

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1. Introduction

Adolescence is a critical period of growth and development, marked by significant physical, emotional, and social changes. Ensuring access to quality health services during this stage is vital for fostering healthy transitions into adulthood. The World Health Organization (WHO) emphasizes the importance of adolescent-friendly health services that are accessible, equitable, acceptable, appropriate, and effective in addressing the diverse health needs of young people globally [8].

Globally, the importance of AFHS has been recognized as a key strategy to address the health needs of adolescents [7, 8]. These services are designed to be accessible, acceptable, equitable, appropriate, and effective for young people. However, the success of these services hinges on multiple factors, including the socio-demographic characteristics of the adolescent population, the quality of the health system, and the perception of health risks among the youth. [4, 7]

In Kenya, adolescents constitute a substantial portion of the population, and their health outcomes are influenced by various factors, including socioeconomic status, cultural practices, and access to healthcare services (Kenya National Bureau of Statistics [4].

Informal settlements, such as Mathare in Nairobi City County, present unique challenges to the provision of health services. These areas are characterized by high population density, inadequate infrastructure, and limited access to essential services, including healthcare [9]. Adolescents living in informal settlements are particularly vulnerable due to their exposure to environmental and social risks, which can impact their health-seeking behaviors and overall well-being [4].

Previous studies have highlighted several barriers to the utilization of health services among adolescents in low-resource settings, including stigma, lack of privacy, and inadequate service provision [5, 7]. In Kenya, there is limited research on the utilization of adolescent-friendly health services in informal settlements, and understanding these patterns is crucial for developing targeted interventions to improve health outcomes. This study aims to fill this gap by investigating the factors associated with the utilization of adolescent-friendly health services among adolescents in the Mathare informal settlement.

By identifying key factors influencing health service utilization and the barriers faced by adolescents in accessing these services, this study seeks to inform policy and practice aimed at enhancing the provision of adolescent-friendly health services in informal settlements. [3]

2. Materials and Methods

2.1. Study Design

This study employed a cross-sectional descriptive design to assess the utilization of adolescent-friendly health services

(AFS) in Mathare informal settlement, Nairobi County, Kenya. The study focused on understanding how socio-demographic characteristics, health system factors, and perceptions of health risks influence the use of these services among adolescents.

2.2. Study Area

The research was conducted in Mathare, one of Nairobi's largest informal settlements. Mathare is characterized by high population density, poverty, and limited access to essential services, including healthcare. The area is home to a significant adolescent population, making it a relevant location for this study.

2.3. Study Population

The target population included adolescents aged 15-19 years residing in Mathare. This age group was selected due to their increased vulnerability to health risks and the potential for long-term health consequences if their health needs are unmet. Healthcare providers and community leaders were also included in the study to provide insights into the availability and quality of AFS

2.4. Sample Size Determination

A sample size of 325 adolescents was determined using Cochran's formula considering a 95% confidence level, a 5% margin of error. The sample was adjusted for a 10% non-response rate, resulting in a final sample size of approximately 323 participants.

2.5. Sampling Technique

The study targeted adolescents aged 15-19 living in the Mathare informal settlement, which comprises 13 distinct communities. A stratified sampling technique was used, with the population of 1,720 adolescents organized into four formal youth groups: Talanta (615 youth), MYSA (415 youth), NI-YDG (375 youth), and Maendeleo Mabatini (315 youth). The sample size was calculated using Taro Yamane's formula, resulting in a sample of 325 adolescents, representing 18.9% of the total population. Each youth group formed a stratum, and participants were selected through simple random sampling from each stratum. This approach ensured proportional representation from each group in the final sample.

2.6. Data Collection Methods

Data were collected using structured questionnaires administered through face-to-face interviews. The questionnaire covered socio-demographic characteristics, health system factors, perceptions of health risks, and utilization of AFS.

2.7. Data Analysis

Quantitative data were analyzed using SPSS version 20. Descriptive statistics, including frequencies, means, and percentages, were used to summarize the data. Chi-square tests and logistic regression analyses were performed to examine the association between independent variables (socio-demographic characteristics, health system factors, perceptions of health risks) and the dependent variable (utilization of AFS). Qualitative data from KIIs were analyzed thematically to complement the quantitative findings.

2.8. Ethical Considerations

Ethical approval was obtained from Kenyatta University Ethics Committee (KUERC, PKU/2686/11815.) and NA-COSTI (Ref No.831878)

Informed consent was obtained from all participants, with additional assent from guardians for adolescents under 18. Participants were assured of confidentiality, and their responses were anonymized. Participation was voluntary, and participants could withdraw from the study at any time

3. Results

3.1. Socio-Demographic Characteristics and Utilization of AFS

The study included 323 adolescents, majority being males (41.2% female, 58.8% male). The majority were aged 17-19 years (98%). Most adolescents were in secondary school (89.2%), with 67.2% living with both parents as presented in [table 1](#) below.

Table 1. Socio-demographic characteristics of study participants.

Characteristic	Freq.	Percent
Age		
15-16	5	1.5
17-19	318	98.5
Total	323	100
Gender		
Female	133	41.2
Male	190	58.8
Total	323	100
Education		
Primary Level	35	10.8
Secondary	288	89.2

Characteristic	Freq.	Percent
Total	323	100
Type of School		
Government School	270	83.9
Private School	52	16.2
Total	323	100
Religion		
Others	74	22.9
Christian	214	66.3
Muslim	35	10.8
Total	323	100
Parent alive		
No	106	32.8
Yes	217	67.2
Total	323	100
Parent occupation		
Not employed	27	8.4
Farmer	27	8.4
Formal occupation	49	15.2
Self-Employment/Business	220	68.1
Total	323	100
Fathers' education		
Higher education	29	9.0
Never attended school	23	7.1
Primary education	152	47.1
Secondary education	119	36.8
Total	323	100
Mothers' education		
Higher education	10	3.2
Never attended school	76	23.5
Primary education	129	40.0
Secondary education	108	33.4
Total	323	100
Live with		
Spouse	71	22.9
Parents	187	58.4
Friends	23	7.2
Relatives	39	12.2

3.2. Health Seeking Behavior

The study illustrated that more than half of the study participants, 56.6%, had sought adolescent-friendly services in the past twelve months, and 43.4 % did not.

Table 2. Utilization of Adolescent-Friendly Services among Adolescents in the last 12 months.

Sought Adolescent Friendly Services in the last 12 months	Freq.	Percent
Yes	183	56.6

Sought Adolescent Friendly Services in the last 12 months	Freq.	Percent
No	140	43.4
Total	323	100

A significant proportion 53.6% (98) sought VCT services, with much lower rates for counseling 10 (5.5%), Post abortal services 10 (5.5%), STI treatment 10 (5.5%), and ANC services (1.6%). This indicates that sexual health services are the primary reason adolescents seek AFS.

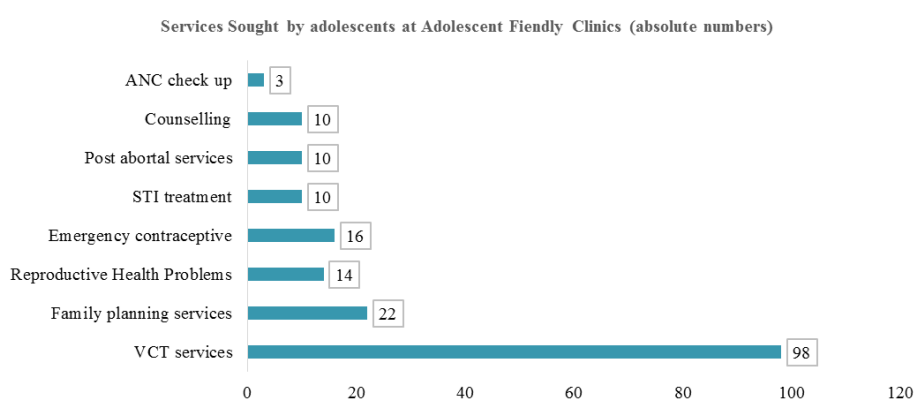


Figure 1. Types of Services Sought in Adolescent-Friendly Services.

Of the population that reported to have utilized the AFS, 50% walked to the nearest AFS 42% used public transport and only 8% used private transport.

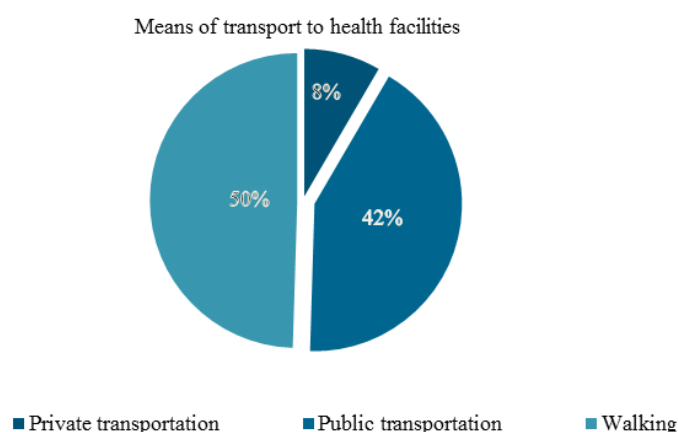


Figure 2. Means of transport used by respondents to health facilities.

Key health system factors influencing the utilization of AFS included waiting time, staff attitude, confidentiality and availability of services as seen in table 3 below

Table 3. Health system factors influencing the use of adolescent-friendly services.

AFHS in Nearby clinics	Yes	No	
Good	181(98.9)	139(99.2)	
Poor	2(1.1)	1(0.8)	
Waiting time	Yes	No	
Good	149(81.4)	138(98.6)	(Fisher's exact $p=0.049$)
Poor	34(18.6)	2(1.4)	
Sufficient time for Consultations	Yes	No	
Yes	75(29.4)	12(26.2)	
No	108(59.0)	128(92.1)	44.13(1), $p=0.001$
Provision to choose to be seen by the same clinician	Yes	No	
Yes	70(54.9)	38(27.3)	
No	113(67.6)	102(72.7)	4.22(1), $p=0.001$
The clinic provides an opportunity to ask questions	Yes	No	
Yes	84(45.9)	31(21.6)	
No	99(54.1)	109(78.4)	20.42(1), $p=0.0001$
Staff communicate in a language adolescent understand	Yes	No	
Yes	32(17.5)	84(60.4)	
No	151(82.5)	56(39.6)	63.22(1), $p=0.0001$

3.3. H01: No Significant Relationship Between Socio-Demographic Characteristics and Utilizing AFS in Mathare

Table 4 below illustrates that there was a statistically significant association between the adolescent education level χ^2 (4.5350 (1), $p=0.033$), type of school χ^2 (24.05 (1), $p=0.001$), religion χ^2 (16.32(1), $p=0.001$), parent's living status χ^2 (28.71 (1), $p=0.001$), parent's occupation χ^2 (24.76(1), $p=0.0001$), father (Fisher's exact $p=0.001$), and mother's levels of education (Fisher's exact $p=0.001$).

Table 4. Bivariate association between socio-demographic characteristics and utilization of adolescent friendly services.

Age	Sought adolescent friendly services		
	Yes	No	
17-19 years	178(97.3)	140(100.0)	fisher's exact $p=0.072$
15-16 years	5(2.7)	0(0.0)	
Gender			

Age	Sought adolescent friendly services		
	Yes	No	
Female	72(39.3)	61(43.6)	0.5882(1), $p=0.444$
Male	111(60.7)	79(56.4)	
Education			
Primary Level	14(7.7)	21(15.0)	4.4347(1), $p=0.035$
Secondary	169(92.4)	119(85.0)	
Type of School			
Government School	169(92.9)	101(72.1)	25.07(1), $p=0.0001$
Private School	13(7.1)	39(27.9)	
Religion			
Atheist	41(2.4)	33(23.6)	16.32(1), $p=0.0001$
Christian	133(72.7)	81(57.9)	
Muslim	9(4.9)	26(18.6)	
parent occupation			
Not employed	23(12.6)	4(2.9)	24.76(1), $p=0.0001$
Farmer	24(13.1)	3(2.1)	

Age	Sought adolescent friendly services		
	Yes	No	
Formal occupation	23(12.6)	26(18.6)	
Self-Employment/Business	113(61.8)	107(76.4)	
Father's education	Yes	No	
Higher education	4(2.2)	25(17.9)	
Illiterate	22(12.0)	1(0.7)	55.43(3), $p=0.001$
Primary education	106(57.9)	46(32.9)	
Secondary education	51(27.9)	68(48.6)	
Mothers' education	Yes	No	
Higher education	6(3.3)	4(2.9)	
Never attended school	42(23.0)	34(24.3)	52.42(1), $p=0.0001$
Primary education	46(25.1)	83(59.3)	
Secondary education	89(48.6)	19(13.6)	

3.4. H01: There is no Significant Association Between Health Factors and Utilization of Adolescent Friendly Services

Table 5 below indicates that there was a statistically significant association between waiting time (*Fisher's exact* $p=0.049$) and staff communication χ^2 (63.22(1), $p=0.0001$). The opportunity to ask questions in nearby health facilities was significantly associated with the utilization of adolescent-friendly services χ^2 (20.42(1), $p=0.0001$)

Table 5. Bivariate association between Health system factors and the utilization of adolescent-friendly services.

Perceived rating of nearby AFHS services	Sought AFS		Total
	Yes	No	
Good	71(38.8)	38(27.1)	7.0893(1), $p=0.029$
Moderate	82(44.8)	65(46.4)	
Poor	30(16.4)	37(26.4)	
Perceived waiting time in Nearby AFHS facilities			

Perceived rating of nearby AFHS services	Sought AFS		Total
	Yes	No	
Good	85(46.5)	55(39.3)	2.1093(1), $p=0.348$
Moderate	54(29.5)	51(36.4)	
Poor	44(24.0)	34(24.3)	
Staff Attitude			
Unfavourable	119(65.0)	63(45.0)	12.93(1), $p=0.0001$
Favourable	64(35.0)	77(55.0)	
Sufficient time for consultation			
Yes	75(41.0)	11(7.9)	44.55(1), $p=0.0001$
No	108(59.0)	129(92.1)	
Staff are non-judgmental			
Good	100(54.6)	18(13.0)	87.17(2), $p=0.001$
Moderate	75(41.0)	68(48.2)	
Poor	8(4.4)	54(38.9)	
staff allow asking questions			
Yes	84(45.9)	31(22.1)	19.53(1), $p=0.0001$
No	99(54.1)	109(77.9)	
Staff use understandable language			
Yes	32(17.5)	84(60.0)	62.288(1), $p=0.0001$
No	151(82.5)	56(40.0)	
Provision to choose same clinician			
Yes	70(38.0)	39(27.9)	3.8329(1), $p=0.050$
No	113(62.0)	101(72.1)	

3.5. H03: There is no Significant Relationship Between the Perception of Health Risk Behavior and the Utilization of AFS

Fisher's exact test of association reveals that the perceived risks among teenagers were statistically associated with using adolescent-friendly services (*Fisher's exact* = 0.004) as illustrated in table 6 below.

Table 6. Risky Behaviors Exposed to Adolescents in Mathare informal settlements.

Risky Behaviors Exposed	Sought Adolescent Friendly services		
	Yes	No	
risk injuries	0(0)	1(0.8)	
Alcohol	2(1.1)	4(3.0)	
Sexual	6(3.4)	10(7.5)	
Dietary behaviours	3(1.7)	0(0)	<i>Fisher's exact = 0.004</i>
Physical activity behaviour	5(2.8)	5(3.7)	
Gambling	63(35.6)	25(18.7)	
Hygiene behaviour	63(55.4)	89(66.4)	

4. Discussion

4.1. Socio-Demographic Factors on Utilization

Socio-demographic characteristics such as age, education level, and living arrangements significantly influenced the utilization of adolescent-friendly health services (AFS). [1, 2, 4, 7]

The socio-demographic characteristics of adolescents in Mathare informal settlements play a significant role in determining their health service utilization. The study population consisted mainly of older adolescents, with 98.5% aged between 17 and 19 years. This demographic group, experiencing critical physical and social transitions, is crucial for targeted health interventions. [1]

Gender distribution showed 58.8% males and 41.2% females, suggesting possible gender-related differences in health-seeking behavior, although this study did not explicitly categorize service utilization by gender. [2, 4] Educational attainment is a key factor, with 89.2% of respondents in secondary school, likely contributing to better health awareness and service access compared to the 10.8% still in primary school [5].

The reliance on public education is evident, with 83.9% attending government schools, possibly reflecting economic constraints. Students from private schools (16.2%) may have greater access to health services, highlighting socio-economic disparities. [5]

Religious composition, with 66.3% Christians and 10.8% Muslims, may influence attitudes towards certain services, particularly reproductive health. [2, 4, 5] Parental status also plays a role, with 67.2% of respondents having both parents alive, potentially providing emotional and financial support, while the 32.8% without parents may face additional challenges accessing services.

Parental education is another influential factor, with 47.1%

of fathers and 40.0% of mothers having secondary education, which correlates with better health outcomes and higher service utilization. These socio-demographic factors, collectively, impact adolescents' health behaviors and access to adolescent-friendly health services. [2, 4]

4.2. Health System Factors

In this study, 56.6% of adolescents in Mathare utilized adolescent-friendly services (AFS) in the past year, indicating moderate awareness and availability. However, service utilization was affected by key health system factors. While 47.7% of adolescents rated the services as good, significant barriers included negative staff attitudes (56.2%), insufficient consultation time (73.4%), and moderate waiting times (46%). Effective communication by staff was crucial, with 64.1% noting the need for clearer explanations. [12]

Most services accessed focused on HIV Voluntary Counseling and Testing (69.9%), while counseling services (0.7%) and reproductive health services (5.4%) were underutilized, pointing to gaps in promotion and accessibility [5, 7]. Accessibility remained a challenge, with 60% of adolescents traveling 30-60 minutes to reach AFS, and socio-economic barriers and concerns about confidentiality were significant deterrents. [11]

Peer influence was notable, with 53.9% of adolescents preferring to discuss AFS with friends rather than parents or teachers. Waiting times ($p=0.049$) and staff communication ($p=0.0001$) were significantly associated with service utilization, emphasizing the need for improvements in service quality, reduced wait times, and more adolescent-friendly environments to enhance uptake. [10, 12]

4.3. Perception of Health Risks

The adolescents' perceptions of health risk behaviors highlighted the environmental and social challenges they face. Poor hygiene (59.9%) and gambling (28.2%) were the highly perceived risk factors for the use of adolescent-friendly services, reflecting the harsh living conditions and the limited recreational opportunities in the Informal settlements. These behaviors are concerning as they can lead to significant health issues and perpetuate a cycle of poverty and poor health. [6] Inferential statistics reveal a strong association between perceived risk factors and adolescent-friendly services. [4] reports that gambling among youths has increased significantly over time due to increased access to smartphones. Additionally, they note that gambling in the early years of life is likely to be profoundly detrimental to the mental, emotional, and social health of children, to impact development and school performance negatively, and to increase the risk of acquiring other addictions. [9] Avers that risky sexual behavior among adolescents has a direct and indirect impact on social and economic well-being, such as an increase in maternal and infant mortality, school dropouts, HIV/AIDS prevalence,

substance abuse, and suicidal deaths. [6, 13] Notes that self-esteem among adolescents influences self-perceptions either negatively or positively.

The lower percentages of risky behaviors related to physical inactivity (3.2%), dietary habits (1.3%), and alcohol consumption (1.9%) may either reflect actual lower incidences of these behaviors or a lack of awareness and reporting among the adolescents. [14] Nonetheless, these areas still require attention to prevent potential health problems.

5. Conclusions

This study underscores the complex interplay of socio-demographic characteristics, health system factors, and perceptions of health risks in shaping the utilization of adolescent-friendly health services (AFS) in Mathare informal settlements.

Key socio-demographic factors like age, education, and living arrangements significantly influence AFS use, highlighting the need for targeted outreach to vulnerable groups [2] Health system factors, particularly staff attitudes, confidentiality, and wait times, are crucial in ensuring adolescents feel comfortable accessing services. Furthermore, adolescents' perceptions of health risks, especially regarding sexual and reproductive health, drive their engagement with available services.

Addressing these elements holistically is vital for improving adolescent health outcomes in similar settings. Comprehensive policies, resource allocation, and community engagement are recommended to enhance service delivery and utilization [8]

Abbreviations

AFHS	Adolescent Friendly Health Services
KDHS	Kenya Demographic and Health Survey
MOH	Ministry of Health
MYSA	Mathare Youth Sports Association
NACOSTI	National Commission for Science, Technology, and Innovation
NIYDG	Ngei I Youth Development Group
NRHP	National Reproductive Health Policy

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Author Contributions

Domitila Musau: Conceptualization, Writing – original draft, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources

Isaac Mwanzo: Conceptualization, Supervision, Validation, Methodology

Harun Kimani: Formal Analysis, Investigation

Data Availability Statement

The data supporting the outcome of this research work has been reported in this manuscript.

Conflict of Interest

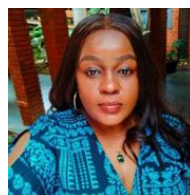
The authors declare no conflicts of interest.

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Biography



Domitila Syokau Musau, a student in Kenyatta university with interest in public health research area