

Research Article

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A Latent Class Analysis of Coping Strategies Among Women in Informal Settlements in Nairobi, Kenya

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Abstract

Objective: Women living in informal settlements face psychosocial stressors with limited access to mental health resources. Understanding their coping strategies is crucial to informing mental health interventions that address structural inequities and promote resilience in low-resource urban settings. This study examines the coping mechanisms employed by women in Kibera and Mathare, two of Nairobi's largest informal settlements, to manage daily stressors.

Methods: The study utilized cross-sectional data from the baseline survey of a longitudinal cohort study that examined the impact of climate change on mental health among women residing in informal settlements in Nairobi, Kenya. The sample included 800 participants (400 from each settlement) to assess eight categories of coping strategies: emotional avoidance, self-care, substance use, mental health support, social support, religiosity, participation in family activities, and media dependence. It applied Latent Class Analysis (LCA) to identify distinct subgroups of coping.

Results: A four-class model was favored based on the Bayesian Information Criterion (BIC). The largest class (51%) relied on emotional avoidance, the second largest (31%) on religiosity, the third (10%) on social support, and the fourth (8%) on health care support and family activities. Most women used emotion-focused coping strategies at 83%, while a minority of 17% adopted problem-focused coping strategies.

Implications: This study provides valuable insights into developing mental health support systems and policies that aim to assist women residing in informal settlements. The common tendency among residents to avoid expressing emotions and to rely on religious coping strategies highlights the urgent need for accessible mental health support within these communities. Community-based interventions that incorporate peer support models, culturally relevant psychoeducation, and faith-based approaches can effectively close existing care gaps. To reduce mental health disparities in under-resourced urban areas, it is important to implement scalable structural solutions that increase access to problem-focused coping resources and connect them with formal mental health services.

Introduction

The current global population in informal settlements is approximately one billion¹. This figure is projected to triple by 2050²⁻⁴, primarily due to increasing rates of rural-to-urban migration^{5,6} and various economic challenges that compel people to live in informal settlements⁷. This situation is further exacerbated by refugees and migrants from neighboring countries seeking safety and stability⁸. In Kenya, approximately 6.5 million people out of 55 million reside in urban informal settlements⁴.

Residents of informal settlements face numerous challenges, including high population density, inadequate housing, and limited access to essential services such as clean water and sanitation^{9,10}. These overlapping conditions heighten health risks and facilitate the rapid spread of communicable diseases, especially during extreme weather events¹¹. Many residents experience unreliable electricity or resort to illegal sources, creating additional safety hazards¹². The settlements typically lack sufficient housing for their residents¹³. Often, these communities are in ecologically sensitive areas, such as floodplains, riverbanks, regions with sparse vegetation on slopes, and zones near industrial facilities. Women in these environments are particularly vulnerable to a range of environmental stressors, such as extreme weather events (including floods, heatwaves, and cold spells), increased insecurity, and mental health issues^{14,15}. This research examines the coping strategies employed by women living in informal settlements, where residents confront multiple stressors. Here, coping refers to mental and behavioral efforts to manage challenging situations that strain or exceed one's capacity¹⁶.

Women in these areas face numerous obstacles that are compounded by various stressors, which may heighten their risk of stress-related health issues¹⁷. The prevalent issues of insecurity¹⁸, alongside gender inequality and more significant vulnerabilities, compel women to confront gender-based violence¹⁹ while also dealing with economic hardships²⁰. High unemployment rates push women into the informal sector, where they are most likely to be underpaid, and the informal sector has limited labor protections²⁰. The lack of leadership opportunities and participation in community governance further deepens these issues, as noted by Williams et al., (2024)²¹. Financial constraints often hinder women from relocating or effectively managing stress-related outcomes, contributing to significant mental health challenges¹⁷.

In informal settlements, distinct social, economic, and environmental challenges compel women to adopt various coping mechanisms²². Often, these women seek emotional support and material assistance from family members and neighbors²³. Faith-based activities are often used for coping, including prayer, attending religious gatherings, and actively contributing to community spiritual projects^{24,19}.

Additionally, women frequently engage in health-seeking behavior as a coping strategy, enabling them to access essential medical and mental health services provided by community health workers²⁵, who play a crucial role. People use various coping strategies based on their preferences and specific situations²⁶. Several factors, including the nature of the stressor, individual characteristics, and available resources, influence the effectiveness of these coping strategies. The stress and

coping model proposed by Lazarus and Folkman (1984)¹⁶ is a vital theoretical model for understanding how individuals assess stressful situations and select coping methods. Coping strategies can be categorized into two main types: problem-focused and emotion-focused coping. Problem-focused coping involves identifying the causes of stress to develop actionable and realistic solutions²⁷. Addressing fundamental challenges, such as job hunting or improving living conditions, is crucial for alleviating significant stressors and promoting long-term mental health and well-being²⁸. In contrast, emotion-focused coping strategies aim to reduce emotional distress. Techniques such as seeking social support and practicing emotional regulation are essential for managing short-term emotional upheaval²¹ (Biggs et al., 2017).

The effectiveness of coping strategies varies based on the characteristics of the stressor, individual traits, and available resources. The transactional model of stress and coping developed by Lazarus and Folkman¹⁶ provides a suitable framework for exploring coping styles among women living in informal settlements in Kenya. This complex yet nuanced model captures the intricacies of how individuals assess and respond, as well as whether they choose to respond to ongoing stressors that are far from straightforward¹⁶. It emphasizes the interplay between the resources available to women and the environmental demands they face, ranging from the chronic challenges of living in inadequate housing to potential environmental disasters.

Although the literature on coping strategies has significantly expanded, research focusing on women's coping mechanisms within informal settlements remains limited. This study aims to fill this critical gap by exploring a fundamental question: What coping strategies do women in informal communities employ to navigate challenges? Given their unique living conditions, this study examines the strategies and coping categories employed by these women to determine whether they rely more on problem-focused or emotion-focused strategies. Investigating women's coping strategies in informal settlements allows us to develop targeted community programs that acknowledge and leverage their coping strategies in challenging situations. The findings from this study provide valuable insights to guide future initiatives aimed at improving the living conditions and overall welfare of women in these communities. By focusing on the lived experiences of these women, we can shape targeted interventions and policies that align support systems and resources with their diverse coping strategies during adverse circumstances.

Method

Procedures

This study utilized cross-sectional data from the baseline

survey of a longitudinal cohort study that examined the effects of climate change on mental health among women in informal settlements in Nairobi, Kenya²⁹. Household-level surveys were conducted with 800 female participants residing in the informal settlements of Kibera and Mathare in September 2022. Surveys were administered by 16 trained female community data collectors (CDCs), a method previously employed by the principal investigator in similar studies^{18,30}. The CDCs received training in ethical research principles, quantitative data collection, and the World Health Organization's (WHO) ethical and safety guidelines on research involving violence against women and other sensitive topics³¹. Safety protocols were established in collaboration with investigators, local partners, and CDCs to address instances where participants disclosed violence, depression, and suicidality. The surveys, averaging 35-60 minutes in length, were conducted in person at participants' homes or private locations to minimize disruptions to their daily routines. The study adhered to local COVID-19 regulations and recommendations.

Sample and Recruitment

A probability sampling approach was used to recruit 400 women from Kibera and 400 from Mathare. The method, previously employed without adverse incidents, relied on OpenStreetMap (.osm) data from community-driven mapping initiatives in Kibera and Mathare, providing detailed information about the structures and boundaries of these settlements³². To establish the sample, a fishnet grid, with each cell measuring 9 square meters (3m by 3m), roughly equivalent to the size of a tin or mud house or a room in a high-rise, the settlement boundary data exported from OpenStreetMap. A random selection function in ArcGIS Pro identified 400 random grid cells per settlement for sampling. GPS coordinates for 50 random grid cells were then uploaded onto the tablets of each of the 16 CDCs, with 8 CDCs assigned to each settlement. The last birthday method was then used to select one eligible woman from each household to participate in the study. Participants had to be residents of the informal settlement for at least six months before the study and be at least 18 years old. Additionally, only women who spoke either Swahili or English were included, as Swahili serves as the lingua franca in informal settlements, with nearly all residents being proficient in and using Swahili for communication. All participants gave their written consent after the CDC explained the study and addressed any questions they had.

Measures

Coping Strategies: Since a validated coping measure specific to women in informal settlements was not available, we employed a community-based approach to identify relevant coping strategies. The measure was developed in consultation with our community advisory

board, informed by the lived experiences of women and recent empirical research conducted by the study team. Participants were asked to identify how they had coped with stress in the past month from a list of 22 coping strategies from prior studies in informal settlements in Nairobi. These items included getting a good night's sleep, decreasing food intake, increasing food intake, doing nothing, enhanced self-care, engaging in reading and puzzles, meditation, alcohol use, drug use, consulting health providers, speaking with mental health professionals, assisting others, relying on friends, learning on family, discussing matters with pregnant women, engaging in religious practices, participating in family activities, increasing news consumption, decreasing news consumption, spending more time on TV, increasing social media usage, and reducing social media engagement.

To enhance interpretability, we organized the 22 coping behaviors into broader categories for analysis, drawing from multiple sources of guidance. First, we grounded our grouping in Lazarus and Folkman's (1984) theoretical framework, distinguishing between problem-focused and emotion-focused coping. Second, we reviewed empirical literature on coping strategies in low-resource and crisis-affected contexts, particularly among women in informal settlements. Third, we consulted with our trained interviewing staff, as well as residents of Kibera and Mathare, who provided valuable insights into how participants and local community members understood and described these coping behaviors. Based on their interpretations and familiarity with the cultural and contextual nuances, we synthesized the items into eight categories: Emotional Avoidance, Self-Care, Substance Use, Health Provider Support, Social Support, Religiosity, Participation in Family Activities, and Media Engagement (Table 1). This process ensured the final groupings reflected theoretical grounding and social and contextual relevance, as well as the realities of women living in informal settlements. We prioritized culturally grounded synthesis and staff validation to ensure ecological validity, aligning with principles of community-engaged research.

Analytical Framework

Latent Class Analysis (LCA) was performed using Latent Gold software version 6.1 to identify subgroups exhibiting similar coping profiles. This study is particularly well-suited for conducting an LCA of the coping strategies employed by women living in informal settlements in Kenya, as it facilitates the recognition of distinct coping patterns within this diverse demographic. Moreover, there is a pressing need to categorize these strategies to enhance the effectiveness of programming and interventions. LCA serves as an effective tool for examining the coping mechanisms of women in informal settlements, enabling the identification of subgroups that might otherwise remain undetected within

the broader population due to their similar responses to various stressors. By utilizing LCA, we can uncover variations in these strategies, illuminating the differences among subgroups of women and their approaches to managing their circumstances. This analysis highlights patterns that may easily escape traditional analytic methods and clarifies the needs and strengths of each group. Model fit statistics and the interpretability of latent classes were considered when determining the optimal number of classes.

Table 1: Categories of Coping Strategies

Categories of Coping	Coping strategies
Emotional Avoidance	<ul style="list-style-type: none"> - Decreased food intake - Increased food intake - Doing nothing - Sleep
Mindful Practices	<ul style="list-style-type: none"> - Increased self-care (e.g., taking baths, facial makeup) - Increased time reading books or doing activities like puzzles and crosswords - Meditation and/or mindfulness practices
Substance	<ul style="list-style-type: none"> - Using alcohol - Using drugs
Health Providers	<ul style="list-style-type: none"> - Talking to health providers more frequently - Talking with a mental health care provider (e.g., therapist, psychologist, counselor)
Social Support	<ul style="list-style-type: none"> - Helping others - Talking with friends - Talking with family - Talking to people who are pregnant or parenting
Religiosity	<ul style="list-style-type: none"> - praying, reading the bible, going to church
Participation in Family Activities	<ul style="list-style-type: none"> - Engaging in more family activities (e.g., farming, washing, games, sports)
Media Engagement	<ul style="list-style-type: none"> - Increased television time (i.e., movies, watching TV shows) - Increased time on social media (Facebook, WhatsApp, Instagram, and others) - Decreased time on social media (Facebook, WhatsApp, Instagram, and others) - Increased time following news coverage - Decreased time on following news coverage

Results

Descriptive Statistics

Half of the participants were from Mathare, and the other half were from Kibera. The sample was diverse, comprising 32% of individuals aged 18-28, 36% aged 29-38, 17% aged 39-48, and 15% aged 49 or older. Nearly half (45%) identified as the head of their household, while 55% were married, 9% were widowed, 10% were divorced, 17% identified as single, and 9% were in committed relationships but not married. Additionally, 76% of women reported lacking health insurance coverage, and 53% reported having an employed partner.

Model Selection and Number of Classes

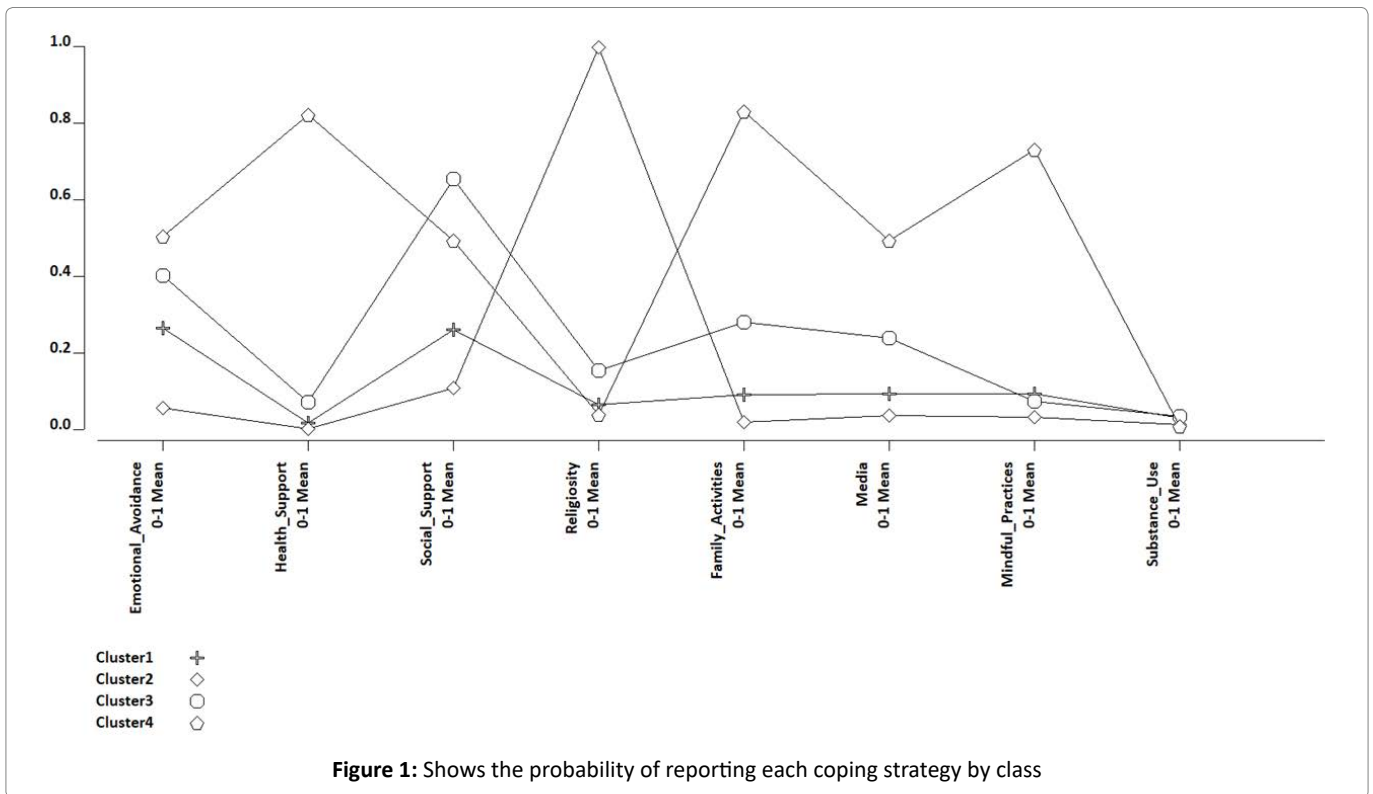
Latent Class Analysis (LCA) models ranging from one to six latent classes were evaluated. Model selection was based on fit indices, with the four-class model emerging as the best fit, as indicated by the lower Bayesian Information Criterion (BIC) score (7667.75). The Akaike Information Criterion (AIC) favored the six-class model because it generally favors more complicated models without considering sample size³³. Given our large sample size, the BIC was prioritized because it has been shown to perform more reliably in such contexts²⁶. (Table 2)

The coping profiles and their associated strategies are illustrated in Figure 1. The largest group, accounting for 51% of participants, primarily utilizes emotional avoidance, which is an emotion-focused coping strategy. In the second group, 31% of participants rely on religiosity as their primary coping strategy. The third group, comprising 10% of participants, typically employs social support as their coping strategy. Finally, the fourth group, consisting of 8% of participants, adopts problem-focused coping strategies by discussing their concerns with healthcare providers, engaging in family activities, and practicing self-care to manage stress.

Class 1 (Emotional Avoidance): Results show that women living in informal settlements often respond to challenges through emotional avoidance, which serves as their primary coping mechanism. According to Lazarus and Folkman (1984), avoidant coping involves individuals intentionally avoiding stressors. A significant portion of

Table 2: Model fit indices for the latent class models

Criteria	Number of Latent Classes					
	1	2	3	4	5	6
Loglikelihood	4208.17	3867.12	3721.56	3683.47	-3666.7	-3650.1
Akaike Information Criterion (AIC)	8452.33	7788.24	7515.12	7456.94	7441.4	7426.17
Bayesian Information Criterion (BIC)	8536.65	7914.73	7683.76	7667.75	7694.36	7721.2
Likelihood ratio chi-square statistic	1764.51	1082.43	791.3	715.13	681.58	648.36
Entropy	N/A	0.82	0.85	0.83	0.85	0.84
Lo-Mendell-Rubin Likelihood Ratio Test (VLMR)	N/A	682.08	291.13	76.17	33.54	33.22



this group, totaling 51%, mainly employs emotional coping strategies. Some women in this category relied on emotional support from friends and family when faced with difficulties.

Class 2 (Religiosity): This class includes women who manage stress through moderate coping mechanisms, particularly through religious practices such as prayer and listening to music. This group comprises 31% of individuals and shows the second-highest probability of using limited coping strategies. Religion was the primary coping mechanism for most women, with a score of 0.99, compared to other classes.

Class 3 (Social Support): Individuals in this class are more inclined to utilize social support to cope with stress, with a correlation of .65. Social support falls under problem-focused coping strategies. This class comprises 10% of the participants in this study.

Class 4 (Participating in Family Activities and Seeking Health Support): This class accounts for 8% of the women in this study and includes women who frequently report using various coping strategies. Many members reported receiving support from healthcare providers through interactions with mental health professionals and consultations with other healthcare practitioners (0.89). Engaging in family activities emerged as the most preferred coping method for navigating adversity within this group, with a likelihood of participation of 0.82.

While analyzing coping strategies among the different

classes, it became evident that most showed varying probabilities. Notably, the fourth class actively sought support from healthcare providers to manage stress. Women in classes one through three demonstrated similar tendencies toward neglecting self-care practices and mindful coping strategies. Coping strategies involving group activities or social interactions showed more apparent distinctions between classes than those requiring individual efforts. Most women, 83%, utilized emotion-focused coping techniques, while a smaller portion, 17%, relied on problem-focused methods. The smallest subgroup (8%) demonstrated high levels of mental health service usage, highlighting significant disparities in access to formal care. Notably, participants did not report substance use as a coping mechanism, likely due to the associated costs and societal stigma around women’s disclosure of substance abuse as a coping strategy.

Discussion

The research focused on the coping strategies of women residing in two informal neighborhoods in Nairobi, Kenya. The study evaluated the participants’ responses to daily stressors utilizing Lazarus and Folkman’s (1984) stress and coping model as a framework. The analysis identified two distinct combinations of types of coping strategies: emotion-focused approaches and problem-focused methods. Notably, the findings indicated that 83% of participants primarily depended on emotion-focused coping strategies.

Emotional avoidance emerged as the primary coping strategy, with 51% of participants identifying it as their primary approach. Research indicates that individuals living in areas with limited mental health resources often resort to emotion-focused coping tactics^{34,36}. When confronted with significant stressors, many may find avoidance to be their only viable coping mechanism. Women face considerable stigma when discussing stress, which hampers their willingness to seek help due to fears of negative consequences. This leads to higher rates of avoidance behavior among them³⁷⁻³⁹. Budimir et al. (2021)³⁹ found that avoidant coping methods can negatively affect mental health outcomes. These strategies are often inadequate because they fail to address the root causes of stress, resulting in undesirable consequences such as increased anxiety levels, the onset of depression, and heightened interpersonal conflicts⁴⁰. There is an urgent need for intervention for women living in informal settlements who are suffering from depression and suicidal thoughts, along with elevated levels of intimate partner violence and psychosocial stress that surpass national averages³⁰. The primary coping strategy used by women is avoidance, functioning as a means of self-preservation when faced with environmental stressors. This ongoing reliance on avoidance as a coping mechanism suggests either a lack of skills to address challenges directly or an inadequate understanding of effective problem-solving techniques. By relying on avoidance, women fail to confront their core issues and remain vulnerable to additional risks. Among those defined by emotional avoidance, some women still seek support from their social networks to manage their challenges. These social structures and connections offer crucial support that helps these women maintain resilience during difficult times.

Improving the mental health of women who use avoidance coping mechanisms requires targeted interventions that promote self-awareness and teach problem-solving and emotional regulation skills. Developing culturally-relevant coping strategies to address mental health challenges in informal settlements must also advance access to formal mental health resources. Psychoeducation has demonstrated effectiveness through the Friendship Bench model in Zimbabwe, which combines problem-solving training with stress management and relaxation techniques, as noted in research^{41,42}. Recent studies indicate that mobile health (mHealth) interventions effectively provide psychoeducation and skills training through mobile platforms, incorporating mindfulness programs, breathing exercises, and cognitive reframing^{43,44}.

In this study, the women highlight religiosity as a vital coping mechanism that provides essential psychological and emotional support during stressful times. Through their faith, these women find hope and reassurance,

which helps them make sense of the challenges in their lives. In difficult moments, individuals often find meaning in their religious beliefs, interpreting their struggles as spiritual tests, which reinforces their hope to overcome these obstacles. Research by Rabbani et al. (2011)³⁵ demonstrates that religion can serve as a substitute for social support networks for those who lack them. Faith-based organizations can enhance mental health outreach by integrating spirituality into evidence-based practices, thereby reducing stigma and increasing access to services. In this study, religion emerged as a prevalent coping strategy. It could be because it was easily accessible, culturally acceptable, and provided emotional support that sustained women through chronic adversity. Having little or no access to resources, with minimal security and virtually no access to legitimate mental health services, these women discovered that prayer and other faith-based practices offered them hope, a sense of control amid chaos, and a way to derive meaning from their hardships. Even when faced with personal or family issues and various forms of distress, they often turned to their Bibles and Qurans as a source of guidance and solace.

The ability of women to navigate challenges is significantly influenced by the resources available to them³⁵. Their survival under challenging environments largely depends on their access to these resources and support systems. Strong social networks provide essential emotional and practical support from family, friends, and community groups, enabling women to better manage adversity. In contrast, those lacking social support encounter greater difficulties during tough times and may turn to religious practices as their primary source of comfort. Religion fosters community connections, providing emotional support and enhancing individuals' resilience during difficult times. An example of an effective intervention for individuals who primarily rely on religious coping strategies is using the problem management plus (PM+) a mental health intervention and adding aspects of spirituality in it. This approach integrates problem management skills with culturally and spiritually significant practices, beliefs, and resources within the PM+ framework. By doing so, it honors the participants' worldviews and seamlessly incorporates what many view as spiritual, often religious, coping strategies alongside the essential techniques of PM+. These are particularly relevant in communities where spirituality plays a significant role in navigating life's ups and downs. Access to social networks, religious, and community resources is vital in how women cope with life's challenges.

Research indicates that 18 percent of women utilize problem-focused coping strategies, while only 8 percent actively pursue health services. Analyzing the data reveals significant barriers to accessing mental health services,

including stigma, financial constraints, and a lack of awareness that hinder individuals from taking advantage of available options. Therefore, low-cost interventions that can be administered by non-experts, such as PM+, can be adopted and employed for individuals who use problem-focused coping strategies to manage adversity. Enhancing mental health literacy within community structures, such as peer support systems and religious organizations, could promote help-seeking behaviors.

Structural approaches are crucial for addressing mental health disparities in low-resource urban areas, necessitating solutions that extend beyond individual coping mechanisms. Improved access to services and integrating primary care with culturally sensitive strategies can strengthen mental health resilience. Future research should investigate the effects of specific interventions on mental health outcomes and coping strategies within informal community settings. Community programs tailored to women could yield better outcomes by fostering problem-focused coping techniques and reinforcing social networks. Studies show that up to 18% of women engage in problem-focused strategies, highlighting the importance of active, solution-oriented methods, such as those exemplified by the Friendship Bench Intervention. The united advocacy of various service providers for increased mental health support underscores the need to combine formal services with community-based approaches. Merging mental health services with primary healthcare presents a promising strategy for improving access to care for women living in disadvantaged conditions, thus enhancing both coping skills and professional support.

Findings must be understood in the context of study limitations. First, we did not use standardized tools for measuring coping. Instead, we collaborated with our community advisory board and community members to create a comprehensive list of coping strategies. We determined whether these items would provide relevant insights and serve as a foundation for developing a coping measure specifically for informal settlements and prioritizing the coping strategies that address the unique needs of this population. Additionally, the study's scope limited access to more information from the participants, making it difficult to understand the significance of each coping strategy. Participants may have resorted to excessive sleeping, for example, as a response to stress. A qualitative research approach could provide deeper insights into these stress management techniques.

Implications

The findings of this study hold significant relevance for research, policy, and practice. Research must develop coping measures that are culturally grounded and contextually appropriate for women in informal settlements. We need

a much deeper understanding of their coping strategies. More thorough qualitative work is necessary to truly understand what these strategies mean to the women who use them and why some coping strategies are preferred over others, particularly in nuanced choices like media use or family participation. The policy implications of this study are evident. Expanded and accessible mental health services must be integrated with the types of primary healthcare that women in low-resource, urban settings can realistically access.

Additionally, we must tackle the stigma, financial burdens, and the mere absence of service provisions that hinder these settings from being viable. Practically speaking, the findings of this study indicate that community-based interventions incorporating various service models—ranging from social networks to faith-based organizations to mHealth technologies—may genuinely foster positive mental health among these women and assist them in coping with the unaddressed mental health issues that affect their lives. These communities hold hope.

Although this study focused on Nairobi's informal settlements, similar conditions, such as overcrowding, economic precarity, and limited access to healthcare, are common across informal settlements globally. The coping profile identified here, particularly reliance on religiosity and avoidance, reflects some overlap with other low-resource urban settings. These findings may inform interventions in similar contexts, though adaptations to local cultural, social, and infrastructural conditions are essential.

Conclusion

Our study identified four distinct coping profiles among women in Nairobi's informal settlements, emphasizing the predominance of emotion-focused strategies. The findings underscore the pressing need for community-driven mental health initiatives that foster problem-focused coping strategies while considering cultural and social contexts. Enhancing access to mental health services, integrating coping education into existing community programs, and leveraging social and religious networks could provide sustainable pathways for psychological resilience. Future research should investigate how interventions tailored to each coping class can alter behavioral patterns and improve mental health outcomes. By understanding and addressing these coping mechanisms, policymakers and practitioners can better support women navigating stress in resource-constrained environments, ultimately fostering well-being and resilience in informal settlements. Addressing these coping behaviors through targeted interventions can improve resilience and mental health outcomes. Future research should examine how demographic characteristics, such as age, motherhood status, or household composition,

relate to coping profiles to better understand interventive strategies for improving coping. Future research should also explore longitudinal trends in coping mechanisms and evaluate the effectiveness of intervention programs.

Data Availability

Data supporting the findings of this study are available from the principal investigator upon reasonable request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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References

1. Boanada-Fuchs A, Kuffer M, Samper J. A Global Estimate of the Size and Location of Informal Settlements. *Urban science*. 2024; 8(1): 18. doi:10.3390/urbansci8010018
2. Global Informal Settlements and Urban Slums in Cities and the Coverage. In: *Global Informal Settlements and Urban Slums in Cities and the Coverage. Resilience of Informal Areas in Megacities—Magnitude, Challenges, and Policies: Strategic Environmental Assessment and Upgrading Guidelines to Attain Sustainable Development Goals*. 2021: 1-51. doi:10.1007/978-3-030-87794-1_1
3. Jones P. Formalizing the Informal: Understanding the Position of Informal Settlements and Slums in Sustainable Urbanization Policies and Strategies in Bandung, Indonesia. *Sustainability*. 2017; 9(8): 1436. doi:10.3390/su9081436
4. UN-Habitat. *Urbanization and Development: Emerging Futures. World Cities Report. Nairobi, Africa, 2016*. <https://unhabitat.org/wp-content/uploads/2014/03/WCR-%20Full-Report-2016.pdf>
5. Mberu BU, Ezeh AC, Chepngeno-Langat G, et al. Family Ties and Urban-Rural Linkages among Older Migrants in Nairobi Informal Settlements. *Population space and place*. 2013; 19(3): 275-293. doi:10.1002/psp.1711
6. Mthiyane DB, Wissink H, Chiwawa N. The impact of rural-urban migration in South Africa: A case of KwaDukuza municipality. *Journal of local government research and innovation (Online)*. 2022; 3: e1-e9. doi:10.4102/jolgriv3i0.56
7. Camacho R, Aryal J, Rajabifard A. How do disasters disrupt the spatial growth of informal settlements? A multi-temporal remote sensing approach – The case study of Mocoa, Colombia. *Habitat international*. 2025; 156: 103272. doi: 10.1016/j.habitatint.2024.103272
8. Fransen S, de Haas H. Trends and Patterns of Global Refugee Migration. *Population and development review*. 2022; 48(1): 97-128. doi:10.1111/padr.12456
9. Zerbo A, Delgado RC, González PA. Vulnerability and everyday health risks of urban informal settlements in Sub-Saharan Africa. *Global Health Journal*. 2020; 4(2): 46-50. doi: 10.1016/j.glohj.2020.04.003
10. Tsinda A, Abbott P, Pedley S, et al. Challenges to achieving sustainable sanitation in informal settlements of Kigali, Rwanda. *International journal of environmental research and public health*. 2013; 10(12): 6939-6954. doi:10.3390/ijerph10126939
11. Semenza JC, Rocklöv J, Ebi KL. Climate Change and Cascading Risks from Infectious Disease. *Infect Dis Ther*. 2022; 11(4): 1371-1390. doi:10.1007/s40121-022-00647-3
12. de Bercegol R, Monstadt J. The Kenya Slum Electrification Program. Local politics of electricity networks in Kibera. *Energy research & social science*. 2018; 41: 249-258. doi: 10.1016/j.erss.2018.04.007
13. Cherunya PC, Truffer B, Samuel EM, et al. The challenges of livelihoods reconstruction in the context of informal settlement upgrading. *Environment and planning A*. 2021; 53(1): 168-190. doi:10.1177/0308518X20926514
14. Darkey D, Kariuki A. A Study on Quality of Life in Mathare, Nairobi, Kenya. *Journal of human ecology (Delhi)*. 2013; 41(3): 207-219. doi:10.1080/09709274.2013.11906569
15. Kerbler B, Kerbler B. The urban space of post-communist cities, informal settlements and brownfields during climate change. *Urbani izziv*. 2015; 26(2): 75-81. doi:10.5379/urbani-izziven-2015-26-02-000
16. Lazarus RS, Folkman Susan. *Stress, Appraisal, and Coping*. Springer Pub. Co. 1984.
17. Im H, Saleh M, Khetarpal RM. Embodiment of structural vulnerability: illness experiences among Somali refugee women in urban displacement. *Ethnicity & health*. 2024; 29(8): 963-986. doi:10.1080/13557858.2024.2385112
18. Winter SC, Johnson L, Obara LM. Neighborhood Cohesion, Perceptions of Disorder, and the Geography of Women's Fear of Crime in Informal Settlements in Nairobi, Kenya. *American journal of community psychology*. 2021; 68(3-4): 385-401. doi:10.1002/ajcp.12519
19. Pryer JA, Clay EJ. Poverty and vulnerability in Dhaka slums: the urban livelihoods study. *Development policy review*. 2004; 22(1): 122-123.
20. Corburn J, Karanja I. Informal settlements and a relational view of health in Nairobi, Kenya: sanitation, gender and dignity. *Health promotion international*. 2016; 31(2): 258-269. doi:10.1093/heapro/dau100
21. Williams RD, Kitts G, Levy TM, et al. Relationship of Perceived Racial Discrimination and Age of Onset for Cigarette, Alcohol, and Marijuana Use among Adolescents. *Health behavior and policy review*. 2024; 11(6): 10-19. doi:10.14485/HBPR.11.6.2
22. Deshpande T, Michael K, Bhaskara K. Barriers and enablers of local adaptive measures: a case study of Bengaluru's informal settlement dwellers. *Local environment*. 2019; 24(3): 167-179. doi:10.1080/13549839.2018.1555578
23. Van Gasse D, Wyninckx B. Social Support Exchange in Shared Living Arrangements with Older Adults—Exploring the Benefits of Intergenerational Living for Older Adults. *Population Ageing*. 2024; 17(2): 277-295. doi:10.1007/s12062-023-09427-4
24. Tarpeh S, Hustedde R. How faith-based organizations perceive their role in community development: An exploratory study. *Community development (Columbus, Ohio)*. 2021; 52(1): 61-76. doi:10.1080/15575330.2020.1831565
25. Mathur Gaiha S, Sunil GA, Kumar R, et al. Enhancing mental health literacy in India to reduce stigma: the fountainhead to improve help-seeking behaviour. *Journal of public mental health*. 2014; 13(3): 146-158. doi:10.1108/JPMH-06-2013-0043
26. Achnak S, Vantilborgh T. Do individuals combine different coping strategies to manage their stress in the aftermath of psychological contract breach over time? A longitudinal study. *Journal of vocational behavior*. 2021; 131: 103651. doi: 10.1016/j.jvb.2021.103651
27. Olonilua OO, Ogbeleakhu Aliu JO. Reviewing the critical role of coping strategies in enhancing mental health and resilience in disaster survivors. *Environmental research, health: ERH*. 2025. doi:10.1088/2752-5309/adb6cc

28. Paw NL, Htike KM, Nawawonganun R, et al. Exploring the association of depression and post-traumatic stress disorder among humanitarian aid workers along the Thai Myanmar border. *Mental health & prevention*. 2025; 37: 200409. doi: 10.1016/j.mhp.2025.200409
29. Winter SC, Winter MR, Plaxico L, et al. Extreme weather should be defined according to impacts on climate-vulnerable communities. *Nature Climate Change*. 2024; 14(5): 462-467. doi:10.1038/s41558-024-01983-7
30. Winter SC, Obara LM, McMahon S. Intimate partner violence: A key correlate of women's physical and mental health in informal settlements in Nairobi, Kenya. *PloS one*. 2020; 15(4): e0230894. doi: 10.1371/journal.pone.0230894
31. World Health Organization. Problem Management plus (PM+): Individual Psychological Help for Adults Impaired by Distress in Communities Exposed to Adversity. WHO generic field-trial version 1.0. World Health Organization. 2016. <https://apps.who.int/iris/handle/10665/206417>
32. Schultz M, Voss J, Auer M, et al. Open land cover from OpenStreetMap and remote sensing. *International journal of applied earth observation and geoinformation*. 2017; 63: 206-213. doi: 10.1016/j.jag.2017.07.014
33. Vrieze SI. Model Selection and Psychological Theory: A Discussion of the Differences between the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC). *Psychological methods*. 2012; 17(2): 228-243. doi:10.1037/a0027127
34. Fatemeh Abdi, Fatemeh Alsadat Rahnemaei, Parisa Shojaei, et al. Social determinants of mental health of women living in slum: a systematic review. *Obstetrics & gynecology science*. 2021; 64(2): 143.
35. Mpanje D, Gibbons P, McDermott R, et al. Social capital undergirds coping strategies: evidence from two informal settlements in Nairobi. *Int J Humanitarian Action*. 2022; 7(1): 1-16. doi:10.1186/s41018-022-00115-0
36. Wainaina CW, Sidze EM, Maina BW, et al. Psychosocial challenges and individual strategies for coping with mental stress among pregnant and postpartum adolescents in Nairobi informal settlements: a qualitative investigation. *BMC pregnancy and childbirth*. 2021; 21(1): 661-661. doi:10.1186/s12884-021-04128-2
37. Calderon C, Gomez D, Carmona-Bayonas A, et al. Social support, coping strategies and sociodemographic factors in women with breast cancer. *Clin Transl Oncol*. 2021; 23(9): 1955-1960. doi:10.1007/s12094-021-02592-y
38. Okati-Aliabad H, Ansari-Moghadam A, Mohammadi M, et al. The prevalence of anxiety and depression and its association with coping strategies, supportive care needs, and social support among women with breast cancer. *Support Care Cancer*. 2022; 30(1): 703-710. doi:10.1007/s00520-021-06477-2
39. Budimir S, Probst T, Pieh C. Coping strategies and mental health during COVID-19 lockdown. *Journal of mental health (Abingdon, England)*. 2021; 30(2): 156-163. doi:10.1080/09638237.2021.1875412
40. Solberg Ø, Sengoele M, Nissen A, et al. Coping in Limbo? The Moderating Role of Coping Strategies in the Relationship between Post-Migration Stress and Well-Being during the Asylum-Seeking Process. *International journal of environmental research and public health*. 2021; 18(3): 1004. doi:10.3390/ijerph18031004
41. Abas M, Bowers T, Manda E, et al. "Opening up the mind": problem-solving therapy delivered by female lay health workers to improve access to evidence-based care for depression and other common mental disorders through the Friendship Bench Project in Zimbabwe. *International journal of mental health systems*. 2016; 10(39): 39-39. doi:10.1186/s13033-016-0071-9
42. Chibanda D, Bowers T, Verhey R, et al. The Friendship Bench Programme: A Cluster Randomised Controlled Trial of a Brief Psychological Intervention for Common Mental Disorders Delivered by Lay Health Workers in Zimbabwe. *BioMed Central Ltd*. 2015. doi:10.1186/s13033-015-0013-y
43. Hall CS, Fottrell E, Wilkinson S, et al. Assessing the impact of mHealth interventions in low- and middle-income countries - what has been shown to work? *Global health action*. 2014; 7(1): 25606-25606. doi:10.3402/gha.v7.25606
44. Stowell E, Lyson MC, Saksono H, et al. Designing and Evaluating mHealth Interventions for Vulnerable Populations: A Systematic Review. In: *ACM*. 2018: 1-17. doi:10.1145/3173574.3173589