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Determinants of inequalities in self-perceived health among the urban poor in Kenya: A gender perspective

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ABSTRACT

Background

Gender health inequalities are largely socially determined. Though perception of health differs between the genders in many societies, little is known of the social determinants of gender inequalities in self-perceived health among the urban poor in developing economies in sub-Saharan Africa.

Objectives

To identify the social determinants of self-perceived health among the genders in an urban informal settlement in sub-Saharan Africa and to determine the extent of the gender health inequalities.

Methods

This cross-sectional and observational community based study was carried out between August and November 2012 in Korogocho informal settlement of Nairobi, capital of Kenya; a sub-Saharan African country. Primary data were collected with pre-tested structured questionnaires from randomly selected adults aged 25 to 59 years residing in Korogocho. The independent variables were age, education and employment status. The dependent variable was categorized into poor and good self-perceived health. Data were analyzed with SPSS v 20. Statistical significance was set at P<0.05.

Results

The mean age (±SD) of the 719 participants was 34.2 ± 8.7 years. Women (73.9% of participants) were younger on average but were still significantly less educated with higher levels of unemployment than men (all P<0.05). Women also had higher prevalence of poor self-perceived health than men (28.3% vs. 20.7%; P<0.05).

Conclusion

Though younger, the prevalence of poor health was significantly higher among women who were also more socially disadvantaged in terms of education and employment than men. The findings stress the importance of gender analysis in research and highlight the crying need for gender-informed social policies, strategies and interventions to reduce gender health inequalities among the urban poor.

Keywords: Gender Health Inequalities, Urban Poor, Social Determinants

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INTRODUCTION

Despite robust research on health inequalities in urban areas, very little research has been directed at unraveling the context-specific factors associated with gender health inequalities among the poor living in urban informal settlements particularly in sub-Saharan Africa (SSA). Data are limited on gender-related health inequalities to inform policy and practice, given the differences in vulnerabilities and exposures of men and women to health damaging living and working conditions in urban informal settlements.[1]

More than half of Africa's population in urban areas lives in urban informal settlements. In Nairobi, capital of Kenya a country in SSA, 60% of the population resides in burgeoning informal settlements.[2] Poor health indices are set to worsen dramatically with doubling of population growth by 2030 should gender inequalities not be properly tackled.[3]

Health is a useful resource for human growth and national development. Health data from surveys of urban areas are not usually disaggregated to capture the peculiarities of urban informal settlements. Yet, there are stark differences in health indices between residents in urban informal settlements and other areas in cities such as Nairobi.[4] Gender-related health inequalities have been assessed using presumed objective health indicators that do not include the participants' assessment of their own health.

According to Wagstaff and colleagues, a good health indicator should reflect the experience of the population.[5] Self-perceived health (SPH) is a widely available indicator of health experience in public health research. World Health Organization (WHO) has adjudged SPH, a research tool that requires the respondent to respond to the question: "how would you rate your current state of health?" as one of the best indicators of individual and population health.[6] Though subjective, SPH is valid and reliably predicts objective health markers, captures multiple health domains and therefore adequately reflects the health of the population.[7] Unfortunately, SPH, which is simple to administer and readily available, remains underutilized in resource-limited research settings such as urban informal settlements.

Women live longer than men on the average due to biological advantage. But, women tend to live less healthy lives compared to men; a phenomenon referred to as gender and health paradox or male-female health survival paradox.[8] This lends to reason the tendency for women's self-perceived health's to be generally worse than men's self-perceived health. However, the trajectory is for the gap between men and women's self-perceived health to close with advancing age and after adjusting for differences in socioeconomic status.[9]

Gender-related health inequalities research has mainly been conducted at extremes of life, among the very young and the elderly. Related research in the most productive age group between 15 and 64 years is scarce in SSA where there is dire need for productivity and development particularly in Kenya where more than 50% of the population is between 15 and 64 years.[10] In the present study, we hypothesized that self-perceived health would be worse among women than men despite common exposure to the pervasive, health damaging conditions in urban informal settlements.

We set out to shed light on gender health inequalities in a disadvantaged informal settlement in Nairobi, Kenya by interrogating the demographic and socio-economic factors that are associated with self-perceived health between- and within- both genders among working age adults residing in Korogocho. Korogocho is one of the largest informal settlements in Nairobi and a prototype of disadvantaged communities in SSA.

Findings of the study could provide insights into the factors that drive gender health inequalities among the urban poor. Better understanding of the driving factors would create a narrative for gender-sensitive policies and interventions to address gender health inequalities, leverage population health and hence facilitate growth and development in disadvantaged communities in general.

METHODS

Participants and Procedures

This cross-sectional, observational study was carried out in Korogocho, the fourth largest informal

settlement after Kibera, Mathare Valley, and Mukuru kwa Njenga in Nairobi, capital of Kenya. Korogocho informal settlement occupies a land area of approximately 1.5m^2 with a population of 41,946 (10). Korogocho informal settlement is a typical urban informal settlement in SSA being abode of the urban poor, overcrowded with insecure tenure, poor quality housing and underserved with essential services such as clean water, improved sanitation and health care. The settlement has a predominant population of working age adult men and women. Located in the new Kasarani North Division, Kasarani District, to the North-East of Nairobi County, Korogocho informal settlement's nearest eastern neighbor is Nairobi's largest landfill, the Dandora Municipal Waste Dumpsite. The heavily polluted Nairobi River also runs alongside the Dumpsite.

For ease of administration, Korogocho informal settlement is a Location that is subdivided into three sub-Locations: Nyayo sublocation, comprising Nyayo, Kisumu Ndogo, and Korogocho A villages; Korogocho sublocation consisting of Korogocho B and Highridge villages; and Gitathuru sublocation composed of Grogan A, Grogan B, Gitathuru, and Ngomongo villages. The Location is headed by a Chief, the sub-Locations are led by Assistant Chiefs and each of the nine villages is headed by an elder.

The study population was drawn from a random cluster sample of households from all the nine villages in Korogocho informal settlement. We used a probability proportional to size (PPS) sampling based on a sampling frame of the sub-Locations sourced from the Kenya Population and Housing Census (10). The resulting proportion was then divided among the constituent villages in each sub-Location according to their population. The final sample of 719 adults consisted of 369 from Gitathuru sub-Location, 189 from Korogocho sub- Location, and 161 from Nyayo sub-Location. With the representative sample, we hoped to achieve appropriately significant scientific and statistical inferences that are generalizable to the target population.

Only one adult per household who met the inclusion criteria preferably, the household head, was interviewed. Inclusion criteria consisted of *de facto* adult household residents of villages in Korogocho informal settlement aged between 25 and 59 years on their last birthday and who had lived continuously in the village for at least six months prior to the date of interview for this study to ensure suitable exposure to conditions in the village. Other criteria for participation in the study were mental competence and voluntary informed consent. The homeless, institutionalized or mentally incompetent persons and those who withheld consent were excluded.

Measures

The explanatory variables comprised socio-demographic factors and the outcome variable was self-perceived health (SPH). We collected the data through closed and structured interview schedule questionnaire in Kenya's two national languages: English and Kiswahili. The questionnaire was pretested.

Socio-Demographic Factors

Demographic variables included in this study were age in years; gender; current marital status; religion; and village of residence within Korogocho informal settlement. Age was collected as discrete numerical variable but analyzed in categories of ages 25-34 years, 35-44 years, 45-54 years and 55-59 years. Gender was either male or female. Marital status was categorized as never married, married, separated, cohabiting, divorced or widowed. However, for analysis, participants who were separated, cohabiting, divorced or widowed were grouped into a new category "Others" because of the relatively small individual cell numbers. The religion of participants was categorized as either Christian or Non-Christian. The nine villages in Korogocho informal settlement are Gitathuru, Grogan A, Grogan B, Highridge, Kisumu Ndogo, Korogocho A, Korogocho B, Ngomongo and Nyayo. All variables were self-reported and analyzed by gender.

The socioeconomic factors assessed from participants were level of education and employment status. Level of education was categorized into (i) no formal education (none), (ii) primary school, and (iii) secondary school or higher. For employment status, participants were categorized into (i) unemployed if they had not been in gainful employment in the

preceding six months, (ii) employed, if they were in gainful employment within the preceding six months as employee or self-employed.

Self-Perceived Health (SPH)

SPH, the outcome variable was assessed on a five-point Likert scale from the ordinal responses of participants to the single-item question: "How would you rate your current state of health in general? Is it Excellent, Good, Fair, Poor or Very Poor?" The responses were subsequently dichotomized into (i) Good comprising Excellent, Good, and Fair responses and (ii) Poor consisting of Poor and Very Poor responses.

Data Analysis

All the data were analyzed using IBM SPSS Statistics, Version 20.0. Armonk, NY: IBM Corp. Descriptive statistics of the demographic, socioeconomic, and SPH variables were expressed as frequencies and percentages for all of the participants and disaggregated by gender. Age, the only continuous parametric variable was reported as mean and standard deviation for the sample population and separately for men and women. For bivariate analysis, Pearson's Chi Square tests were employed to determine statistically significant differences in demographic variables between- and within- gender groups. Unadjusted and adjusted odds ratios, confidence intervals and two-tailed P values were used to ascertain statistically significant differences in demographic and socioeconomic variables by self-perceived health and between- and within- gender groups. To examine the demographic and socioeconomic factors that were independently associated with poor SPH in men or women, we used binary logistic regression models.

Ethical Approval

Kenyatta University Ethics Review Committee (KU-ERC) granted the study, ethical approval through a letter with reference: KU/R/COMM/51/44. Having satisfied the guidelines for Ethical Conduct of Biomedical Research involving Human Subjects in Kenya (2004), Kenya National Council for Science and Technology (NCST) through a Research Permit: NCST/RCD/12A/012/140 gave the study, research clearance and authorization. All study participants voluntarily gave informed consent and were assured of anonymity and confidentiality.

RESULTS

One hundred and eighty-eight males (26.1%) and 531 females (73.9%) in Korogocho informal settlement participated in the study. The distribution of respondents in the nine villages that make up Korogocho informal settlement is shown in Figure 1. The highest number of participants (101; 14%) was drawn from Grogan B and the least number (41; 5.7%) was from Korogocho A. The number of females was consistently higher than males in all the villages. The unintentional oversampling of females could be attributed to presence of more females in their homes at the time of the interviews, which took place during the day to assure interviewers' safety and interviewees' convenience.

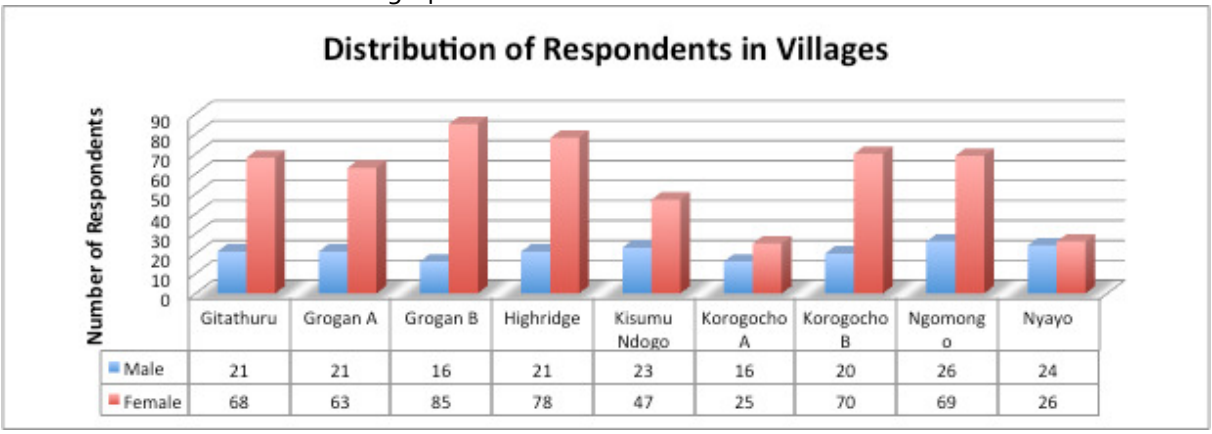


Fig 1 Distribution of Participants in Villages of Korogocho Informal Settlement by Gender

Table 1 shows the demographic and socioeconomic characteristics of the participants. The mean age with standard deviation [SD] of the participants was 34.2 ± 8.7 years. On the average, women were significantly younger than men (Mean age of women, 33.6 ± 8.7 years vs. mean age of men, 35.9 ± 8.3 years; P<0.002). Proportion of men was more than two and a half times the proportion of women in the oldest age category consisting of 55-59 year olds. The participants were more likely to be women (73.9%), Christian (77.2%), married (63.6%), and with primary school education (66.2%). More than a third (35.3%) of the participants were unemployed and women were four times more likely to be unemployed than men.

Table 1 Characteristics of Participants

Characteristic	Male (188) N (%)	Female (531) N (%)	Total (719) N (%)
Age (years)			
25-34	97 (51.6)	337 (63.5)	434 (60.4)
35-44	59 (31.4)	116 (21.8)	175 (24.3)
45-54	20 (10.6)	65 (12.2)	85 (11.8)
55-59	12 (6.4)	13 (2.5)	25 (3.5)
Marital Status			
Never Married	47 (25)	31 (5.8)	78 (10.8)
Married	116 (61.7)	341 (64.2)	457 (63.6)
Others (Cohabiting/Separated/ Divorced/Widowed)	25 (13.3)	159 (30)	184 (25.6)
Education			
No Formal	14 (7.4)	80 (15.1)	94 (13.1)
Primary School	110 (58.5)	366 (68.9)	476 (66.2)
Secondary School or higher	50 (34.1)	85 (16)	149 (20.7)
Employment			
Unemployed	19 (10.1)	235 (44.3)	254 (35.3)
Employed	169 (89.9)	296 (55.7)	465(64.7)

Prevalence of self-perceived health among men and women

The overall prevalence of poor SPH was 26.3% in Korogocho Informal Settlement. On aggregate, the prevalence of poor SPH was significantly higher in women than in men (28.3% vs. 20.7%; Confidence Interval [CI] 1.01-2.24; P<0.045). In all age categories, the prevalence of poor SPH was higher among women than among men except the oldest category (55-59 years) where the prevalence of poor SPH among men (58%) was higher than the prevalence of poor SPH among women (38%). However, the difference was not statistically significant (P=0.56).

Table 2 shows the stepladder increase in prevalence of poor SPH from the younger to older age groups among both males and females. However, the association between age and poor SPH was only significant for men (χ^2 (3, N=188)=11.8, P<0.01) but not for women (χ^2 (3, N=531)=3.60, P<0.30). The association of age and poor SPH was statistically significant between men and women (χ^2 (3, N=731)=12.1, P<0.01).

Prevalence of Poor SPH by Marital Status

Women had higher prevalence of poor SPH than men irrespective of the marital status. Married women were more likely than married men to have poor self-perceived health (29.6% vs. 24.1%; P=0.7) The association of marital status with poor SPH was only significant between men and women (χ^2 (2, N=719)=11.1, P<0.005) and not within each gender.

Table 2 Prevalence of Poor Self-Perceived Health among Men and Women

Age Category (Years)	Male (N=188)	Female (N=531)	Total (N=719)
	Poor SPH n (%)	Poor SPH n (%)	Poor SPH n (%)
25-34	16 (16.5)	86 (25.5)	102 (23.5)
35-44	11 (18.6)	38 (32.8)	49 (28)
45-54	5 (25)	21 (32.3)	26 (30.6)
55-59	7 (58.3)	5 (38.5)	12 (48)
Marital Status			
Never Married	6 (12.8)	5 (16.1)	11 (14.1)
Married	28 (24.1)	101 (29.6)	129 (28.2)
Others*	5 (20)	44 (27.7)	49 (26.6)
Education			
No Formal	5 (35.7)	21(26.3)	26 (27.7)
Primary School	25 (22.7)	104 (28.4)	129 (27.1)
Secondary School or higher	9 (14.1)	25 (29.4)	34 (22.8)
Employment			
Unemployed	5 (35.7)	71 (43.3)	76 (42.7)
Employed	34 (25.2)	79 (36.4)	113 (32.1)
Village of Residence			
Gitathuru	4 (19)	11 (16.2)	15 (16.9)
Grogan A	2 (9.5)	8 (12.7)	10 (11.9)
Grogan B	5 (31.3)	28 (32.9)	33 (32.7)
Highridge	0 (0)	17 (21.8)	17 (17.2)
Kisumu Ndogo	7 (30.4)	20 (42.6)	27 (38.6)
Korogocho A	0 (0)	5 (20)	5 (12.2)
Korogocho B	2 (10)	23 (32.9)	25 (27.8)
Ngomongo	11 (42.3)	31 (44.9)	42 (44.2)
Nyayo	8 (33.3)	7 (26.9)	15 (30)
Grand Total	39 (20.7)	150 (28.3)	189 (26.3)

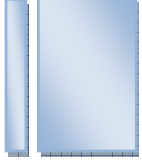
**Others represent Cohabiting, Separated, Divorced or Widowed Participants*

Prevalence of Poor SPH by Educational Status

Only in the category of participants with no formal education was the prevalence of poor self-perceived health higher among men than among women. In all other categories of educational status, the prevalence of poor self-perceived health was higher among women than among men. There was a social gradient among men with regard to educational status and prevalence of poor self-perceived health. The higher the educational level, the lower the prevalence of poor SPH among men. The converse was true for women where the prevalence of poor SPH increased with higher educational status. However, the association between educational status and prevalence of poor SPH was only statistically significant between men and women (χ^2 (2, N=719) =30.2, P<0.001) and not within either gender (P>0.05).

Prevalence of Poor SPH by Employment Status

Almost 90% of men were in some form of employment compared to slightly above 50% of women. Understandably, the trend in both men and women was for the unemployed to report higher prevalence of poor SPH compared to the employed. But, the difference in prevalence of poor SPH between the unemployed and employed men or unemployed and employed women was not statistically significant. However, employment status



was significantly associated with poor SPH between men and women (χ^2 (2, N=719) =15.3, P<0.001).

Prevalence of Poor SPH by Village of Residence within Korogocho Informal Settlement

Prevalence of poor SPH ranged from 11.9% in Grogan A village to 44.2% in Ngomongo village among all participants. Among men, the prevalence ranged from 0% in Highridge and Korogocho A villages to 42.3% in Ngomongo village. The prevalence of poor self-perceived health among women ranged from 12.7% in Grogan A village to 44.9% in Ngomongo village. Across all the villages except Gitathuru and Nyayo, the prevalence of poor SPH was higher among women than among men. The association of village of residence with poor SPH was significant between men and women (χ^2 (8, N=719) =21.7, P<0.01). Within men and women groups, the association of village of residence with poor SPH was also statistically significant (χ^2 (8, N=188) =24.8, P<0.01; χ^2 (8, N=531) =34.6, P<0.001 respectively).

Table 3 Binary Logistic Regression Model of Poor Self-Perceived Health for Both Men and Women, Only Men and Only Women in Korogocho Informal Settlement

Variables	AOR	95% CI		P Value
		Lower	Upper	
Men and Women (N=179)				
Marital Status				
Married	Reference			
Never Married	.75	.27	2.04	.57
Others*	.98	.47	2.02	.95
Education				
No Formal Education	2.73	1.15	6.47	.02
Primary School	2.05	.97	4.62	.08
Secondary School or Higher	Reference			
Employment				
Unemployed	2.12	1.28	3.51	.003
Employed	Reference			
Men (N=188)				
Age (Years)	1.05	1.02	1.07	0.01
Women (N=531)				
Village of Residence				
Gitathuru	1.89	.93	3.87	.081
Grogan A	Reference			
Grogan B	4.47	1.45	13.77	.009
Highridge	2.40	.85	6.76	.099
Kisumu	4.12	1.76	9.61	.001
Ndogo	1.79	.88	3.64	.110
Korogocho A	4.16	1.69	10.26	.002
Korogocho B	4.10	1.97	8.57	.000
Ngomongo	3.46	1.15	9.46	.024
Nyayo				

AOR Adjusted Odds Ratio; 95% CI Confidence Interval
Others stands for Cohabiting, Separated, Divorced, Widowed*

The binary logistic regression model showed that the following factors were significantly associated with poor self-perceived health: having no formal education and unemployment when both men and

women were considered together. Increasing age among men only, and residence in five of the nine villages among women only, were significantly associated with poor self-perceived health. However, marital status was no longer significantly associated with inequalities in poor self-perceived health between men and women in the logistic regression model when other covariates were factored into the model. This suggests that the association of marital status of the participants with poor self-perceived health was modified by the other factors such as age, education, employment and village of residence.

Participants who had no formal education were almost three times (adjusted OR 2.73; 95% CI 1.15-6.47; P=0.02) more likely to have poor self-perceived health than those who had at least secondary school education. The unemployed were two times (adjusted OR 2.12; 95% CI 1.28-3.51; P=0.003) more likely than the participants in employment to have poor self-perceived health. Among men, every additional year in age was associated with 5% likelihood of having poor self-perceived health (P=0.01). Women who resided in Grogan B, Kisumu Ndogo, Korogocho B, Ngomongo, and Nyayo villages were at least three times more likely to have poor self-perceived health than women in Grogan A, that recorded the least prevalence of poor self-perceived health among women (P<0.05).

Poor self-perceived health was significantly higher among women in Grogan B (OR 3.5; 95% CI 1.47-8.33; P<0.005), Kisumu Ndogo (OR 5.3; 95% CI 2.06-13.5; P=0.0005), Korogocho B (OR 3.49; 95% CI 1.42-8.51; P<0.005), and Ngomongo (OR 5.8; 95% CI 2.41-14; P=0.0001) villages than in Grogan A village where the prevalence of poor self-perceived health was lowest (12.7%) among the women. Men and women in Ngomongo village had the highest prevalence of self-perceived poor health (42.3% and 44.9% respectively). No man in Highridge and Korogocho A villages had poor self-perceived health. Generally, only few men had poor self-perceived health when data were disaggregated to individual villages. This precluded further statistical analysis among men relating to the association between village of residence and prevalence of poor self-perceived health.

DISCUSSION

This study determined the prevalence of gender-based poor self-perceived health and identified the socio-demographic factors associated with gender-related health inequalities in Korogocho informal settlement. The prevalence of poor self-perceived health in this study of adults aged 25-59 years was 26.3%. This prevalence is similar to 22.4% reported in another population-based study of adults 15 years and older in a densely populated urban area of Zambia, a country in SSA.[11] Prevalence of poor self-perceived health varied widely from 7% to 61.8% in studies from different parts of the world depending on the study population and methodology. The trend in literature seems to be for the prevalence of poor self-perceived health to be higher in more disadvantaged settings with a prevalence of 61.8% reported from Armenia,[12] a country in transition compared to 7% in Central Part of Sweden.[13] However, methodological differences are more likely to account for the wide variations in the reported prevalence of poor SPH.[14]

A significant association of demographic factors and socioeconomic gradient with self-perceived health was observed in this study. Contrary to the Sen's[15] skepticism associated with the use of self-perceived health in disadvantaged communities, this present study's findings support Subramanian and colleagues' (2009) validation of self-perceived health tool for use in disadvantaged communities.[16] This present study adds to the scant literature on health inequalities in disadvantaged communities using the ubiquitous, valid and reliable SPH tool, which has unfortunately, been largely neglected in public health research in SSA.

On aggregate, women had significantly higher prevalence of poor self-perceived health compared to men (28.3% vs. 20.7% respectively). This finding compares favorably with similar cross-sectional survey among adults in Uganda, a neighboring country to Kenya.[17] The prevalence of poor self-perceived health was reversed in the 55-59 years category in this study with men reporting higher prevalence of self-perceived health than women though the finding was not statistically significant. Ejechi's finding of better self-perceived health in

adult Nigerian women than men due to women's better social engagement suggests that factors other than biology influence self-assessment of health and inequalities.[18]

Studies that interrogate both between- and within-gender health inequalities in SSA are few. The present study extended the gender health inequalities research to include both between- and within- gender health inequalities. In this study, the factors associated with between-gender health inequalities were somewhat different from factors associated with within-gender health inequalities. Also, the factors that were significantly associated with between-gender health inequalities were essentially socioeconomic: education and employment status unlike within-gender health inequalities. Within the male gender, the only age was significantly associated with health inequalities while only village of residence was significantly associated with health inequalities within the female gender.

Socioeconomic factors have been implicated as contributing majorly to health inequalities between genders.[19] Apart from biologic differences in health and life expectancy, socially constructed exposures and vulnerabilities have been proposed to explain disproportionate burden of poor health between women and men. Rohlfsen and Kronenfeld's study[9] revealed more gender health inequalities associated with exposures (predictors of self-perceived health) than with vulnerabilities (responses to predictors). The finding of socioeconomic inequalities in health between the genders compares with a cross-sectional study in Catalonia, Spain in a similar age category (25–64 years).[20] Adjustment for socioeconomic conditions almost eliminated the association between gender and self-perceived health. This lends credence to the perspective that gender health inequalities are mostly attributable to unequal distribution of health-impacting socioeconomic factors between the genders.

Though concentrated and pervasive socioeconomic deprivation was evident in Korogocho informal settlement, there were still social gradients in self-perceived health. The unemployed and uneducated had the highest prevalence of poor self-perceived health and the prevalence decreased progressively up social ladder particularly among the male gender. This was similar to the findings of an observational study of 25-64 year olds in Poland where the social gradient of employment status with self-assessed health was more marked among men than among women.[21]

Curiously, though among participants without formal education men had higher prevalence of poor self-perceived health than women, the converse was the case among participants with the highest level of education. Women with secondary or higher level of education had significantly higher prevalence of poor self-perceived health than men in the same category. Moreover, within the female gender, there was a reversal of social gradient with level of education and self-perceived health. Women with the highest level of education reported the highest prevalence of poor self-perceived health compared to those with lower levels of educational attainment although the difference was not statistically significant. The reason for the inverse gradient in women is unclear. Unexplored confounders such as psychosocial mediators may have been responsible. Indeed a study by Brown et al found that women's self-perceived health was more dependent on spousal education than theirs.[22]

Village of residence was particularly associated with health inequalities among men and women in this study, which resonates with findings of Kyobutungi et al[23] in a survey of elderly participants in the same informal settlement as in this study. However, it was only among women that place of residence was independently associated with poor self-perceived health after adjusting for other covariates. People particularly women, feel less healthy living in deteriorated places.[24] Possibly, residence in a deteriorated place contributed to gender health inequalities in this present study.

This study has some strengths as well as some limitations. The strengths of this study lie in the following areas. Though disadvantaged, the population studied is growing astronomically in number and constitute a significant proportion of the

urban population of working age adults in a country whose economy is still developing. Furthermore, we performed sex- and gender-based analysis (SGBA), which is increasingly gaining relevance in public health research to improve knowledge and to ensure effective policy-making and practice for better health outcomes across the population. In addition, this study has shown that self-perceived health is a valid tool for gender-based health inequalities research in deprived communities such as urban informal settlements.

Limitations of this study include the cross-sectional design, which precludes ability to infer causation of gender health inequalities. Moreover, the relatively small event numbers in some categories particularly among men might have been underpowered to be able to detect some significant associations. For instance, though there was obvious education-related social gradient in self-perceived health among men, the association was not statistically significant. Thirdly, the influence of psychosocial factors on self-perceived health and gender inequalities was not explored in this study though self-perceived health is an inclusive measure that involves psychosocial factors.[25] Finally, we would hesitate to generalize the findings to other urban informal settlements, which are heterogeneous because the study was undertaken in only one settlement.

To conclude, this study enhanced our understanding of gender-based health inequalities in disadvantaged areas and revealed some unique findings. We found that the factors associated with health inequalities significantly differed between- and within- genders. Socioeconomic differentials were more significant between- than within-genders. This study's findings also challenged some long-held assumptions. For example, women did not necessarily have higher prevalence of poor self-perceived health than men in all the categories examined. Men, who belonged to the oldest age category in this study, resided in two of the nine villages and who were uneducated had higher prevalence of poor self-perceived health than women in similar categories. Furthermore, the study revealed inverse social gradient in education and the over-riding effects of place of residence on inequalities in self-perceived health among women in particular. The findings suggest that policies and interventions to reduce health inequalities in disadvantaged communities should be gender- and evidence-informed and should target both compositional and contextual factors in both genders. Future research is recommended to unveil reasons for the inverse educational social gradient associated with women's self-perceived health and the negative health-impacting factors in some of the villages. Similar but longitudinal research could be scaled up and replicated in many urban informal settlements and other disadvantaged communities in SSA to ascertain the causal relationships between socio-demographic factors and gender health inequalities.

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