Procedures Used in Developing and Validating the Quality of Life Scale in the Context of the Ethno-Political Conflicts in Mathare and Kibra, Nairobi City County, Kenya

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Doi: https://doi.org/10.38157/society_sustainability.v2i2.148

Citation: Musya, J. K. (2020). Procedures Used in Developing and Validating the Quality of Life Scale in the Context of the Ethno-Political Conflicts in Mathare and Kibra, Nairobi City County, Kenya, *Society & Sustainability*, 2(2), 31-42. Doi: https://doi.org/10.38157/society_sustainability.v2i2.148

Research Article

Abstract

Slight differences in standard of living, issuing from horizontal inequalities between ethnic groups, are a predicate of ethnopolitical violence in Kenya. Developing and validating a scale to estimate the quality of life differences, between warring ethnic groups, can deepen our understanding of an important precursor of ethnopolitical conflict. From a careful review of poverty and developmental literature, the 16 items used in the Quality of Life Scale emerged. In subsequent exploratory factor analysis, a three-factor solution surfaced, and this was subjected to confirmatory factor analysis (CFA). The CFA model scale met the criteria for composite reliability, construct validity, and strict factorial invariance. The scale has enriched our understanding of the three latent dimensions of quality of life that matter most in characterizing the quality of life. First, the indicator "proud about your life" was the strongest factor for latent factor social and physical wellbeing. Second, "can save income", a proxy for quality of employment. This was the leading indicator for latent factor disposable income. Third, and the indicator "house comfortable to live in" was the notable indicator of latent factor living standards. The Quality of Life Scale can track trends in quality of life of ethnic groups that have a history of ethnopolitical conflict in places like Mathare and Kibra. The scale can be used in other known hotspots of violence in Kenya too where ethnic groups are susceptible to ethnopolitical conflict borne of quality of life differences.

Keywords: Quality of life differences, Ethnic conflict, Social and physical wellbeing, Disposable income, Living standards.

1. Introduction

At the heart of ethnopolitical conflicts is a political culture in which the ruling elite favour some groups and disfavour others. Ruling elite would favour perceived loyal groups with access to political and economic resources, with groups perceived to be disloyal denied a fair share of

access to state resources, especially public goods and services (Robinson, 2009) Given the discriminatory application of state resources, perceived disloyal groups lag behind perceived loyal ones in material and political terms (Bratton & Kimenyi, 2008). Since social and economic imbalances are instrumental to ethnopolitical violence, it made sense to develop scales that researchers can use to estimate the quality of life for in-groups and out-groups in theatres of conflict, in this case, Mathare and Kibra (Oucho, 2002; Okoth & Olang, 2010). In this connection, too, understanding the dimensions of quality of life that are most influential in shaping conflict attitudes among ethnic groups is helpful. This effort requires the development of a scale that can quantify the social and economic status of groups in conflict. This effort is in line with (Abdelal, Herrera, Johnston, & Mcdermott, 2006) call to researchers, in the sprouting field of conflict studies, to operationalize ethnic identity and show how it identity shapes conflict behaviour.

In the literature, measurement problems of living standards have produced inconsistent results: the issue has been whether the individual or the group should be the unit of analysis. The literature distinguishes between vertical and horizontal inequalities, with the former using individuals as a unit of analysis and the latter clustering individuals into groups, hence the distinction made between vertical and horizontal inequalities. The researcher followed Frances Stewart (Stewart, 2000), who argued that what ought to be assessed is horizontal inequalities. An ethnic conflict is a group, rather than an individual enterprise. If so, horizontal inequalities then ought to be the basis of analysing the role of social and economic inequalities in ethnopolitical conflicts. An emerging strand of literature has shown strong connections between horizontal inequalities and the onset of ethnic conflict. The researcher's intuition is that it is not the severity of inequalities per se that contribute to ethnic conflict, but it is the comparisons an ethnic group makes about their quality of life vis-à-vis other groups (Chronic Poverty Advisory Network, 2014). It is such comparisons that render horizontal inequalities instrumental to ethnopolitical conflict.

2. Objectives of the Study

The objectives of this article were to develop and validate a quality of life scale. Both exploratory and confirmatory factor analysis were used. A model issuing from exploratory factor analysis was subjected to validation through confirmatory factor analysis.[1] The emerging model underwent invariance tests, to determine whether it could be used meaningfully to compare the quality of life across groups, that is, whether the CFA model was consistent among the in-group and out-group and identify possible substantial differences. The emerging CFA model was assessed for construct validity and composite reliability.

3. Methods used in the Study

3.1 Sample

The study area had a total household population of 149, 658—62,729 in the seven villages of Kibra and 86, 929 in the six villages of Mathare. The sample was weighted, and this meant that villages

[1] The emerging model from exploratory factors analysis was a hypothesis to be confirmed through confirmatory factor analysis

with a larger population of households had a large sample size. A sample of 766 respondents was identified using proportional and systematic sampling procedures. Eligible respondents were those who voted in the 2007 national and presidential elections and who were heads of households. The sample of 766 was large (48:1) and would enhance the likelihood of valid results (Costello & Osborne, July, 2005).

3.2 Item Selection

Item selection was done using insights gained from the literature on horizontal inequalities. Stewart (2008) has analyzed the problem of social and economic inequalities in Kenya between 1993-2000, inequalities that are pronounced in Nyanza, Western, and Coast provinces. These regions fared badly, in comparative terms, to the Central province about infant mortality, health access, secondary school enrolment, and per capita outlays on infrastructure (roads), and asset ownership. Central and Nairobi provinces, where most Kikuyu people live (the presumed in-group), were the most advantaged regions in Kenya in socio-economic terms. In making comparative analysis, Stewart used several indices including the availability of potable water, scope of rural electrification, and level of secondary enrolment.

Table 1: Illustration of Clusters of Indicators of Quality of Life Differences[2]

Access to Basic Public Services
Satisfied with the supply of water provided by a public utility provider
Satisfied with the quality of health services given by public health provider
Satisfied with the quality of education given by public education provider
Satisfied with the quality of sanitation in the areas where you live
Affordability of Basic Needs
You took three meals a day
You found energy for cooking affordable
House was comfortable to live in
Had electric power in your house
Found it easy to make ends meet most of the time
Voice and Power in Community
Felt safe in your village
People of your ethnic group respected
Had a voice in matters that affected you in the village
Felt proud about your life
Disposable Income
Could save some of your income in making savings
Could spend some of your money buying assets
Could spend some of your money-making investments

Horizontal inequalities arise because of the marginalization of some communities in areas such as health and education. It implicates questions about livelihoods, the standard of living, and

[2]A five-point Likert scale was used to rate responses: 5=Strongly Agree, 4=Agreed, 3=Neutral, 2=Disagree, and 1=Strongly Disagree.

social mobility (Chronic Poverty Advisory Network, 2014). Horizontal inequalities could be assessed too through constructs, such as social power, "voice". The following 16 indicators were used to conceptualize quality of life, implicating as they do estimates of quality of life, the likelihood of social mobility, and community tagging in developmental terms (Chronic Poverty Advisory Network, 2014). Another important indicator of the standard of living is personal safety or security (Barrientos, 2003). The four-point model was clustered as follows: 1) access to basic services, 2) affordability of basic needs, 3) voice and power in the community, and 4) ability to save and invest. The components of each cluster are articulated below. The original list of indicators of quality of life differences was presented to domain experts for scrutiny and validation.

Access to basic public services: Differentiated access to basic public services, such as health and education, points to the problem of horizontal inequalities and social exclusion. Even when people have a regular or decent income, they may not access health and education, if public providers are absent or poorly resourced (Samuel, Alkire, Hammock, & Mills, November, 2014).

Affordability of Basic Needs: This dimension can estimate the levels of household expenditure or consumption. It is a good estimate of the level of household deprivation. It predicates on levels of household incomes, a measure of the level of deprivation (Chronic Poverty Advisory Network, 2014).

Voice and Power in the Community: This dimension of poverty addresses the relational dimension of poverty. It speaks to the notion of "dignity, respect, and freedom from humiliation" (Zavaleta, 2007).

Ability to Save and Invest: This dimension focuses on income poverty. The ability to save, invest, or purchase of assets is an index of wellbeing. People who can exercise agency in these domains of financial wellbeing have income that exceeds their basic household consumption needs. Such people are better able to stand up to shocks and to increase their income through productive assets (Chronic Poverty Advisory Network, 2014).

3.3 Statistical Procedures Used in Developing and Validation the Quality of Life Scale

3.3.1 Initial Reliability Test

The Quality of Life Scale was made up of 16 items. Before undertaking exploratory factor analysis, an initial reliability test was done. The initial Cronbach alpha test showed that the items had acceptable interrelatedness (α=0.91, 16 items) and an average inter-item correlation of 0.4. This was an excellent score (George & Mallery, 2003). The items with the highest inter-correlations were: "Felt Safe in your Village" (0.725), "Felt Proud about your Life" (0.713), and "Had Electrical Power in your House" (0.683), and "Satisfied with the Quality of Health Services" (0.681). These high scoring items would define and characterise differences in quality of life.

Table 2: Reliability Analysis for the Quality of Life Scale

	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Satisfied with the supply of water	.539	.477	.916
Satisfied with the quality of health services	.681	.705	.912
Satisfied with the quality of education	.562	.608	.916
Satisfied with the quality of sanitation	.558	.475	.916
You took three meals a day	.630	.476	.914
You found energy for cooking affordable	.535	.438	.917
House was comfortable to live in	.730	.641	.911
Had electric power in your house	.683	.553	.912
Felt safe in your village	.725	.639	.911
Felt proud about your life	.713	.613	.911
People of your ethnic group respected	.675	.618	.913
Had a voice in matters that affected you in the village	.567	.454	.916
Found it easy to make ends meet most of the time	.468	.375	.919
Could save some of your income in making savings	.640	.572	.914
Could spend some of your money-making investments	.527	.509	.917
Could spend some of your money buying assets	.629	.628	.914

Exploratory factors analysis was done using the Statistical Package for Social Sciences (SPSS Version 23). In this study, I followed (Costello & Osborne, July, 2005) suggestion that "optimal results will be achieved using a true factor analysis extraction method" (p7). Used in this article was the principal axis factoring mode of extraction, with Promax rotation. The proportion of missing value was 0.067% of total variables. Missing values were dealt with by imputing median scores.

In exploratory factor analysis, the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.919 and the Bartlett's Test of Sphericity was significant (χ^2= (105) = 6790.925 $p<0.05$). The factorability of the Quality of Life Scale was established. The scree test can be used to assess the number of latent factors in a model, with the right number of factors to extract in factor analysis. This is indicated by the point at which the curve levels off suggested a four-point model should be used.

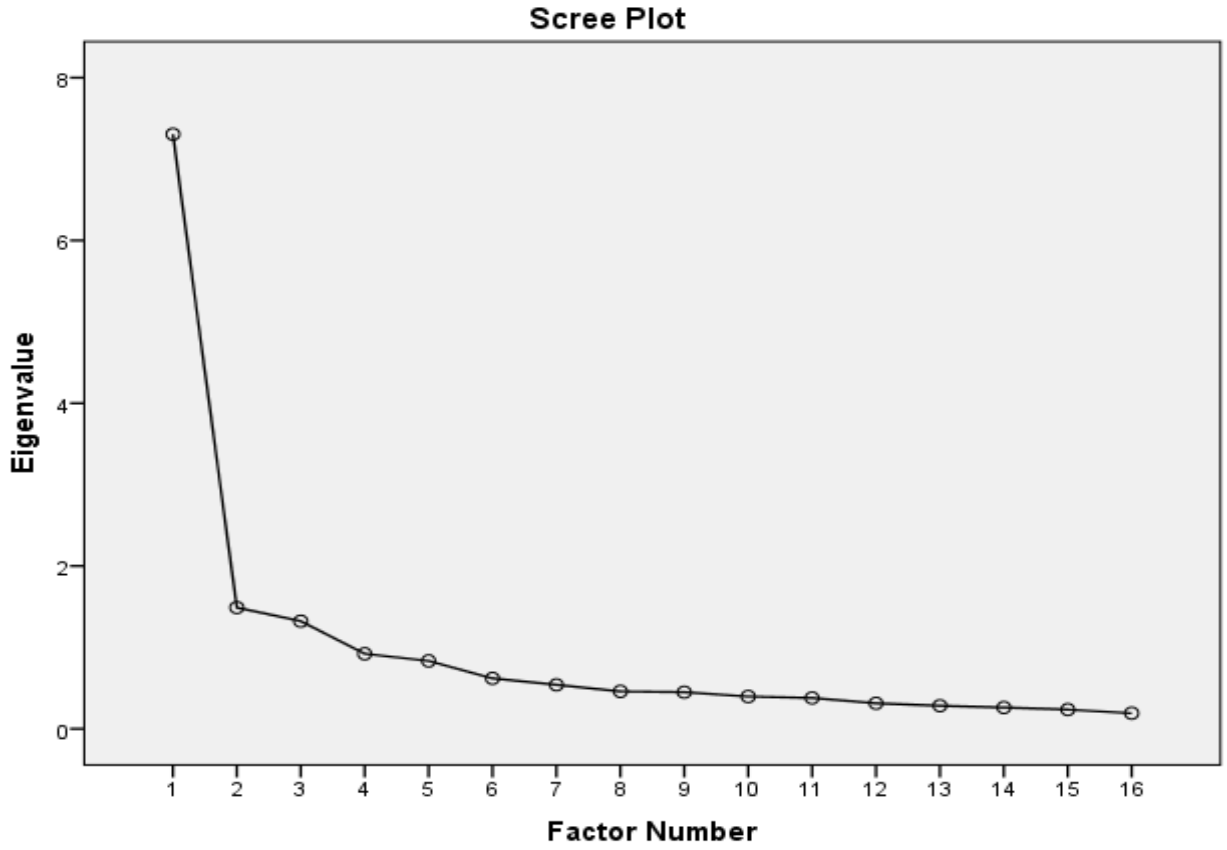

Figure 1 Scree Plot for Quality of Life Scale

Whereas the scree plot suggested a four-factor solution, parallel analysis suggested a five-factor model RMSEA (0.1, 0.061-.079) and TLI (0.9). Consequently, a five, four, and three-factor model were tested.

3.3.2 Five-factor Model

In the pattern matrix for the five-factor model, the notable indicators were: Factor 1 "You found of energy for cooking affordable are in bold" (0.78), "House was comfortable to live in" (0.723), and "Had electric power in your house" (0.67). Factor 1 could be called affordability of basic needs. The indicators that explained the highest variation were "you found energy for cooking affordable and the house was comfortable to live in".

High-scoring indicators for Factor 2 were "People of your ethnic group respected" (0.985), "Had a voice in matters that affected you in the village" (.638), "Felt proud about your life" (0.631). Factor 2 could be called voice and power in the community. Its highest indicators were "People of your ethnic group respected" and "you had a voice in matters that affected you in the village".

High-scoring indicators for Factor 3 were "Could spend some of your money buying assets" (.861), "Could spend some of your income making investments" (.792), "Could save some of your income in making savings" (0.61). Factor 3 was named the ability to save and invest. The highest indicators were "Could spend some of your money buying assets" and "Could spend some of your money-making investments". Factor 4 "Satisfied with the quality of sanitation (0.688), Satisfied with the supply of water (0.63), Found it easy to make ends meet most of the time (.51).

Factor 4 could be called access to basic services. Its highest scoring indicators were "Satisfied with the quality of health services (0.91) and Satisfied with the quality of education (0.74). Factor 5 was called access to basic services. Its highest indicators were quality of health services and satisfied with the quality of education. This five-point model was subject to confirmatory factor analysis. Using the maximum likelihood estimator, confirmatory factor analysis yielded the following results: $\chi 2$ =657.814 (df=94, p=.067, Cmin/df=6.99), SRMR initial, 0.054, RMSEA initial, 0.089 (CI90, .0082, .095), pclose, 0.00, CFI initial =.917, NFI initial =0.915. Localised areas of strain were detected, necessitating the deletion of item 13. This was an acceptable fit, based on RMSEA, CFI, and SRMR. Several areas of localised strain were observed, including the relationships between QL13 and QL 14 (4.0), QL13 and QL13 and 15 (3.9), and QL 13 and QL5 (4.6). Besides, Item 13 had a low loading (0.53); thus, it was deleted. Addressing other localised areas of strain necessitated QL, 13, 2, and QL6. Some modification indices were effected between e1 felt proud about your life and e2 (MI=6) and e10 and e11 people of your ethnic group were respected (MI=7). These moves were logically defensible, given the conceptual relatedness of affected indicators. The final goodness-of-fit indices were as follows: $\chi 2$ =67.5 (df=22, p=.09, Cmin/df=3.0), SRMR modified, 0.03, RMSEA modified, 0.00 (.CI90, .00, .050), pclose, 0.95, CFI modified =1, NFI modified l =0.93. These fit indices were good. However, a problem arose about the five-factor model. This model had several problems. It lacked discriminant validity, with latent factors 1 and 2 in focus. An inspection of the residual covariances revealed a structural weakness. Several areas of strain emerged, for instance, between QL14 and Q12, which effectively left latent factor four, with just one indicator, which effectively meant only a four-factor model would be appropriate.

3.3.3 Four-Factor Model

The goodness of fitness results were: $\chi 2$ =1047 (df=98, p=.000, Cmin/df=10.68), SRMR initial, 0.08, RMSEA initial, 0.113 (CI90,.0.106,.109), pclose, 0.00, CFI initial =.86, NFI initial =0.848. This was not a good model based on the CFI and RMSEA scores. Moreover, it had several areas of localised strain. A three-model solution was subsequently used. The initial goodness-of-fit indices were: $\chi 2$ =568.39 (df=70, p=.000, Cmin/df=8.1), SRMR initial, 0.05, RMSEA initial, 0.096 (CI90,.0089, 0.1), pclose, 0.00, CFI initial =.911, NFI initial =0.9. Several areas of localised strain were observed, including QL4-QL1 (5.1), QL4-QL13 (2.6), QL3-QL13, (4.6), and QL11-6 (2.8). Several indicators were deleted. The final goodness-of-fit indices were as follows: $\chi 2$ =67.5 (df=22, p=.09, Cmin/df=3.0), SRMR modified, 0.03, RMSEA modified, 0.052 (CI90,.038,.066), pclose, 0.384, CFI modified =.987, NFI modified =0.98. Covariances would exist between e1 satisfaction with health services and satisfaction with education services e2 (Chronic Poverty Advisory Network, 2014) and between e3 "People of your ethnic group respected" and e4 "Felt proud about your life" (Chronic Poverty Advisory Network, 2014), and e9 "You took three meals a day" and e10 "Found it Easy to Make Ends Meet Most of the Time" (Samuel, Alkire, Hammock, & Mills, November, 2014). This model was subjected to confirmatory factor analysis.

Table 3: Pattern Matrix for the Quality of Life Scale[a]

	Factor		
	1	2	3
Satisfied with quality of health services	.792		
Satisfied with quality of education	.787		
People of your ethnic group respected	.449		
Felt proud about your life	.401		
Felt safe in your village			
Could spend some of your income buying assets		.877	
Could spend some of your income making investments		.716	
Could save some of your income in making savings		.715	
Had a voice in matters that affected you in the village			
House was comfortable to live in			.796
You took three meals a day			.666
You found of energy for cooking affordable			.641
Satisfied with the quality of sanitation			.627
Found it easy to make ends meet most of the time			.622
Had electric power in your house			.597
Satisfied with the supply of water			.510

Extraction Method: Maximum Likelihood.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 12 iterations.

Table 4: Standardized Residual Covariances for Quality of Life Scale

	QL8	QL5	QL7	QL16	QL15	QL14	QL10	QL11	QL2
QL8	.000								
QL5	-.454	.000							
QL7	.052	.296	.000						
QL16	-.069	.496	-.496	.000					
QL15	.050	1.933	1.593	.000	.000				
QL14	.066	.256	-.430	-.014	.054	.000			
QL10	.388	-.080	.029	-.820	-1.214	-.435	.000		
QL11	-.049	-.608	-1.065	1.483	-.965	.995	.170	.000	
QL2	.396	.546	.074	.679	-.608	.167	.000	-.311	.000

The covariances all fell within the acceptable range of <.1.96. This finding suggests the solution lacked substantial areas of misfit.

Factor 1 could be named "Social and Physical Wellbeing, and it accounted for 42% of all variance. Effectively, then the quality of life can mainly be estimated through factor 1. Factor 2 "Disposable Income", and Factor 3 “Living Standards”.

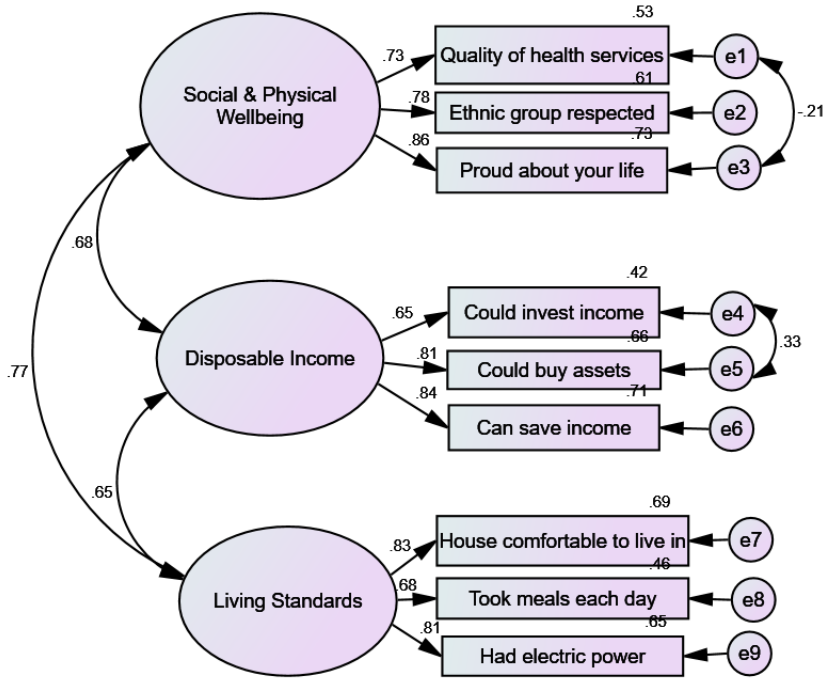

Figure 2: Final Confirmatory Factor Analysis Model for the Quality of Life Scale

The indicators of latent factor *Social and Physical Well being* suggests the measurement of well-being would be across several dimensions, with the core ones being physical health and wellbeing and a sense of individual autonomy and competence—a sense of value and/or worthlessness (da Corta & Magongo, 2013). A critical component of factor 1 was the group sense of being respected/disrespected. Living a dignified life without shame stands for a core dimension of poverty and wellbeing (Zavaleta, 2007). Were people from an ethnic to identify with living in shame in a community, this would be a predicate of group grievance, rather, a proxy for horizontal inequalities that are associated with ethnic conflict. For factor 2, *disposable income* is a proxy for the quality of employment (Lugo, 2007). It can estimate levels of horizontal inequalities, which would manifest as disparities in income between or among ethnic groups. The quality of employment, or level of income, can be assessed by whether a person can make savings or purchase assets (Hulme & McCkay, 2005). Factor 3 estimated the *living standards* of respondents. This refers to how comfortable they felt in their houses, and this included whether they had access

to electric power. For poor households, gaining access to electricity and nutrition is understood as basic to defining and escaping poverty (Ahmed, Hill, & Naeem, 2013).

In an earlier section on exploratory factor analysis, factor 1, emerged by far as the most influential component of quality of life, accounting for 42% of the variance in the model. This suggests quality of life differences in Mathare and Kibra can be examined mainly through the lens of physical and social well-being. If horizontal inequalities are basic to ethnopolitical conflict, then it grows out of offences to a sense of individual and group pride and dignity.

An invariance test was done to ascertain if the factor structure was valid across ethnic groups, especially the in-group and out-groups. Configural, metric, and scalar invariance tests were done. The results are depicted below.

Table 5: Invariance Tests for Quality of Life Scale

Model	χ^2	Df	χ^2_{diff}	Δdf	RMSEA (90%CI)	ΔRMSEA	CFI	ΔCFI
Unconstrained	133.653	66	-		.037 (.028-.046)	-	0.980	-
Measurement weights	154.961	78	21.3	12	.036 (.028-.044)	0.001	0.978	0.002
Measurement Intercepts	205.264	96	50.3	12	.039 (.0037- `046)	0.003	0.968	0.01
Structural covariances	227.811	108	22.5	12	.038 (0.03-.045)	0.001	0.965	0.003
Measurement residuals	276.755	130	48.9	22	.039 (.032-.045)	0.001	0.957	0.008

Losses in CFI and RMSEA scores were below the thresholds of ≤0.01 and ≤0.013 in all nested models. The scale thus attained strict factorial invariance.

Table 6: Validity and Reliability Estimates for Quality of Life Scale

	Factor 1	Factor 2	Factor 3
Composite Reliability	0.86>0.7	0.84>0.7	0.88>0.7
Convergent Validity (AVE)	0.79	0.76	0.77
Discriminant Validity	MSV (0.46<0.79, AVE)	MSV (0.44<076, AVE)	MSV (0.59<0.77)
Divergent Validity	ASV 0.52<0.79, AVE	ASV 0.42<0.76, AVE	ASV 0.5<0.77, AVE

The scale thus satisfied the thresholds for composite reliability as well for both convergent and discriminant validity

4. Conclusion

The Quality of Life Scale has both composite reliability and construct validity. Having satisfied measurement invariance tests, strict factorial invariance, it can be used reliably and validly to estimate the quality of life differences of ethnic groups that take part in an ethnopolitical conflict in Kenya.

This study has broadened our understanding of what needs paying attention to when thinking of the quality of life differences between in-groups and out-groups in Mathare and Kibra. The three dimensions of quality of life have been revealed. They are Social and Physical Wellbeing, Disposable Income, and Living Standards. The highest loading factors for each of the three latent factors were: "Felt Proud about Your Life", "Can Save Some Income", and "Home Comfortable to Live in". The Quality of Life Scale needs to be tested in urban settings susceptible to ethnopolitical conflict, like the ones recurrent in Mathare and Kibra. The scale could assess the quality of life of ethnic groups in other theatres of conflict in Kenya.

Conflict of Interest: The author declares no conflict of interest.

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