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Well-being of Vulnerable Female Migrant Head-Porters (Kayaye) in Urban Ghana: Evidence from Kumasi

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Abstract

The migration of young females from rural Ghana to urban centres like Kumasi as head-porters (kayaye) exposes them to significant vulnerabilities and challenges. This study investigates the socio-economic, health, and well-being conditions of these vulnerable female migrants, focusing on their vulnerability factors, the underlying drivers, and the role of market capital. Drawing from a sample of 200 respondents, the research employs descriptive statistics, correlation analysis, and regression modeling to examine key variables such as income, savings, healthcare access, and social support. The findings reveal that the majority of these migrants are young, with an average age of 23.4 years, and face high levels of vulnerability, with a vulnerability index averaging 0.62. Their average daily income is 26.2 cedis, with a maximum of 50 cedis, and their average savings is 20.7 cedis, indicating limited financial resilience. Healthcare access is a critical issue, with an average healthcare expenditure of 15.3 cedis and a maximum of 30 cedis. The study also highlights the significant role of market capital, with an average market capital score of 0.72 and a maximum of 1.0, suggesting that market capital can mitigate some vulnerabilities. The regression analysis shows that market capital has a strong, statistically significant positive impact on income (coefficient = 0.45, p < 0.01), while vulnerability has a significant negative impact on income (coefficient = -0.30, p < 0.05). These results underscore the critical interplay between vulnerability, market capital, and well-being outcomes. The study concludes that enhancing social capital through community programs, alongside economic and health interventions, is crucial for improving kayaye well-being. Policy recommendations include strengthening social networks, expanding healthcare access, and promoting economic empowerment initiatives. This study provides a comprehensive understanding of the challenges faced by vulnerable female migrant kayaye in Ghana's urban centres and offers evidence-based recommendations for policy interventions to support their well-being and resilience.

1 Introduction and Descriptive

This kayaye sub-female dataset contains demographic and socio-economic variables, covering female-only respondents from Kumasi. The data includes variables on age, marital status, education, income, savings, healthcare expenditure, hospitalization, market capital, and social support. Analysis focuses on vulnerability factors, kayaye well-being, and socio-economic outcomes, including transportation, economic exploitation, and social marginalization.

1.1 Demographic Profile

1.2 Age, Marital Status, Education Distribution

Age Distribution of Kayaye

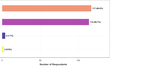
Mean: 23.4 years, Median: 23 years, Range: 18–30

Summary Statistics of Age Distribution

Statistic	Value
Mean	23.4
Median	23.0
SD	3.4
Min	18.0
Max	30.0
Q1	21.0
Q3	26.0

Marital Status Distribution

Marital Status Among Kayaye



Marital Status Frequency

Marital Status	Count	Percentage (%)
Single	77	38.5
Married	97	48.5
Divorced/ Separated	16	8.0
Widowed	10	5.0

Educational Background Distribution

Educational Attainment Among Kayaye

Educational Attainment Frequency

Educational Level	Count	Percentage (%)
Vocational/ Technical	73	36.5
Primary	65	32.5
Junior High School	56	28.0
Senior High School	12	6.0
Vocational/ Technical	3	1.5

Age Distribution: Mean: 23.4 years, Median: 23.0 years, Range: 18–30 years, SD: 3.4 (18–24 in)

Observation: The kayaye are predominantly young, with most aged 18–25 years, reflecting a youthful migrant population. Outliers (30 years) represent older participants in the dataset.

Implication: Young age indicates high labor potential but also vulnerability due to limited experience or resources.

Marital Status: Single: 38.5% (n = 77), Married: 48.5% (n = 114), Divorced/ Separated: 8.0% (n = 16), Widowed: 5.0% (n = 1).

Observation: The majority are married, suggesting family responsibilities may influence their decision to migrate for kayaye work.

Implication: Marital status may influence social support networks and economic pressures, impacting the kayaye's well-being and vulnerability.

Educational Background: Vocational/ Technical: 36.5% (n = 73), Primary: 32.5% (n = 65), Junior High School: 28.0% (n = 56), Senior High School: 6.0% (n = 12), Vocational/ Technical: 1.5% (n = 3).

Observation: Most have low formal education, with 68.5% (Primary and Junior High) at risk, indicating low educational attainment.

Implication: Limited education restricts access to better employment opportunities, increasing economic vulnerability.

1.3 Number of Children

Number of Children

Distribution of Kayaye Number of Children

Number of Children Frequency

Number of Children	Frequency
0	1
1	3
2	7
3	16
4	28
5	40
6	48
7	36
8	21

Summary Statistics of Number of Children

Statistic	Value
Mean	5.51
Median	5.5
SD	2.03
Min	0.0
Max	8.0
Q1	4.0
Q3	7.0

Number of School-Going Children

Distribution of Kayaye Number of School-Going Children

Number of School-Going Children Frequency

Number of School-Going Children	Frequency
0	1
1	3
2	7
3	16
4	28
5	40
6	48
7	36
8	21

Summary Statistics of Number of School-Going Children

Statistic	Value
Mean	5.51
Median	5.5
SD	2.03
Min	0.0
Max	8.0
Q1	4.0
Q3	7.0

Number of Children: Mean: 5.5 children, Median: 5.5, SD: 2.0, Range: 0–8

Observation: Kayaye have large families, increasing financial and caregiving burdens.

Implication: Large families may exacerbate vulnerability due to resource constraints and caregiving responsibilities.

Number of School-Going Children: Mean: 5.5 children, Median: 5.5, SD: 2.0, Range: 0–8

Observation: Among those with school-going children, the average is low, but high variance implies many have no school-aged children.

Implication: Limited schooling access for children is a key vulnerability for families.

2 Migration and Employment

2.1 Migration Reasons

Reasons for Migration

Primary Reasons for Migration Among Kayaye

Reasons for Migration Frequency

Migration Reason	Count	Percentage (%)
Economic Opportunities	155	77.5
Education	2	1.0
Vocational Training	2	1.0
Civil War	1	0.5
Family Reasons	1	0.5

Migration Reasons: Economic Opportunities: 77.5% (n = 155), Education: 1.0% (n = 2), Vocational Training: 1.0% (n = 2), Civil War: 0.5% (n = 1), Family Reasons: 0.5% (n = 1).

Observation: Nearly all migrants for economic opportunities, highlighting economic push factors. Learning is rare among kayaye.

Implication: Economic migration drives vulnerability due to precarious urban employment.

2.2 Employment Status

Employment Status Distribution

Types of Employment Among Kayaye

Employment Status Frequency

Employment Status	Count	Percentage (%)
Full-Time Kayaye Porter	154	76.5
Occasional Work	9	4.5
Others	38	19.0

Full-Time Kayaye Porter: 76.5% (n = 154), Part-Time Kayaye Porter: 4.5% (n = 9), Occasional Work: 19.0% (n = 38), Others: 0.0% (n = 0).

Observation: Most are full-time porters, indicating high labor demand but also high vulnerability due to the nature of the work.

Implication: Full-time kayaye porters face physical strain and lack social protection, contributing to their vulnerability index.

3 Economic Analysis

3.1 Income and Savings

Income vs Savings Relationship

Correlation = 0.104

Daily Income Distribution

Distribution of Average Daily Income

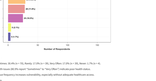
Summary Statistics of Economic Indicators

Variable	Mean	Median	SD	Min	Max
Vulnerability Index	0.62	0.6	0.1	0.3	0.9
Daily Savings (GHS)	20.7	20	10.7	0	100

Income Distribution by Age Group

Savings Rate Distribution

Mean Savings: 20.7%



Savings Rate (%)

Mean: 21.1%, Median: 20.0%SD: 10.1%, Range: 0–50%

Observation: Most save 10–30%, with a few saving up to 50%, indicating economic resilience.

Implication: Low and variable savings reveal economic vulnerability, limiting savings and investment in health or education.

Mean: 24.1%SD: 8.6%Min: 10.0%Q1: 20.1%Q3: 29.0%Max: 50.0%

Observation: Savings rate rises with income for workers, with a median savings rate of 29.0%.

Implication: Limited savings capacity restricts financial resilience, contributing to the vulnerability index.

Correlation: Weak positive (r = 0.104), suggesting low income drives vulnerability.

Observation: Higher income does not strongly predict higher savings, suggesting high expenditure needs (e.g., health, living costs).

Implication: Limited savings amplify economic vulnerability, increasing accessibility.

Income by Age Group

Observation: Income distribution varies by age, with older groups potentially earning more (needs statistical testing).

Implication: Younger kayaye may face more disadvantage due to less experience or networks.

Implication: Age-targeted interventions could address income disparities.

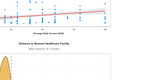
Income by Education

Boxplot shows slight trend in increase with education level, but variability is high.

3.2 Working Hours Analysis

Distribution of Daily Working Hours

Mean: 12 hours, Median: 12 hours, SD: 2.7 hours, Range: 7–20 hours



Work Hours vs Daily Income

Daily Working Hours

Mean: 12.1 hours, Median: 12.0 hours, SD: 2.7 hours, Range: 7–20 hours.

Observation: Long working hours (mean 12 hours) suggest extreme workloads.

Implication: Excessive working hours increase health risks and reduce time for social engagement, impacting well-being.

Work Hours vs Income

Weak positive correlation (r = 0.12), suggesting more hours slightly increase income.

Observation: Longer hours slightly increase income, but diminishing returns are evident.

Implication: Pursuing more hours may paradoxically increase vulnerability, impacting health and well-being.

4 Health and Healthcare Access

4.1 Health Issues Frequency

Frequency of Health Issues

Self-Rating Health Problems Among Kayaye

Most Reported Health Issues

Common Health Problems Among Kayaye

Frequency of Health Issues

Often: 33.0% (n = 78), Sometimes: 31.0% (n = 73), Rarely: 21.0% (n = 50), Very Often: 17.0% (n = 39), Never: 2.1% (n = 4).

Observation: Most experience health issues often or sometimes, indicating widespread vulnerability.

Implication: High health issue frequency increases healthcare costs and productivity loss, exacerbating vulnerability.

Most Reported Health Issues

Malaria: 34.0% (n = 81), Respiratory Infections: 31.0% (n = 74), Others: 21.0% (n = 50), Skin Rashes: 10.0% (n = 24), Non-Diseases: 2.0% (n = 5), Injuries: 2.1% (n = 5).

Observation: Malaria dominates, reflecting environmental risks (e.g., poor sanitation, housing).

Implication: Targeted health interventions (e.g., malaria control) are critical for reducing vulnerability.

4.2 Healthcare Expenditure and Access

Healthcare Expenditure Distribution

Monthly Expenditure (GHS)

Average Health Expenditure (GHS)

Relationship Between Health Expenditure and Income

Average Daily Income (GHS)

Distance to Nearest Healthcare Facility

Mean Distance: 10.1 kilometers

Distance (Kilometers)

Healthcare Expenditure:

Mean: 15.3 cedis, Median: 15.0, SD: 2.8, Range: 5–30 GHS

Observation: High variability and a large range indicate inconsistent healthcare access. The 5 GHS minimum suggests significant financial barriers.

Implication: High health expenditure relative to income (health expenditure: 60% of daily income) exacerbates vulnerability.

Distance to Healthcare Facility:

Mean: 10.1 kilometers, Median: 10 kilometers, SD: 2.8 kilometers.

Observation: Most live 7–13 km from healthcare facilities.

Implication: Distance impedes healthcare access, further exacerbating vulnerability and hindering well-being.

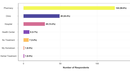
4.3 Hospital Admissions (Last 3 Months)

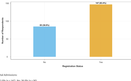
Hospital Admissions in Last 3 Months

Patient Hospitalizations

Admission Status Count Percentage (%)

Admission Status	Count	Percentage (%)
No	149	46.87
Yes	169	53.13





Hospital Admissions

No (149, n = 47), Yes (169, n = 53)

Observation: High insured hospitalization rates reflect serious health challenges.

Implication: Hospital-based interventions must be sustainable, including emergency transport.

Treatment Sources

Pharmacy 54.4% (n = 136), Clinic 10.4% (n = 26), Hospital 10.4% (n = 26), Health Center 4.7% (n = 12), No Treatment 3.2% (n = 7)

Observation: Pharmacies are the primary treatment source, suggesting reliance on self-medication or low trust in hospitals.

Implication: Community-based care must be strengthened to address this potentially inadequate care.

NHIS Registration Status: Yes 67.4% (n = 169), No 32.6% (n = 82)

Observation: Moderate NHIS coverage, but over one-third lack insurance, limiting healthcare access.

Implication: Non-registration increases financial vulnerability for health expenses.

5 Housing and Living Conditions

5.1 Housing Types and Quality

Housing Type: Rented Accommodation 58.4% (n = 146), Squatting 41.6% (n = 104), Housing with Friends/Relatives 0.0% (n = 0), Owned, Hostel, or Government Housing 0.0% each (n = 0)

Observation: Most have rented accommodation, but 100 live in precarious conditions (squatting, shared, Metapolit).

Implication: Prioritize housing e.g., shelter inclusion, tenure security, and affordable rental.

Shelter Type

Metapolit Shelter: 58.4% (n = 146), Cement Compound Building: 41.6% (n = 104), Wooden, Tent, Other: 0.0% (n = 0)

Observation: Shelter is inadequate, with no permanent structures.

Implication: Inadequate shelter exacerbates health risks (e.g., malaria) and vulnerability.

5.2 Access to Basic Amenities

Access to Basic Amenities Summary Table

Amenity	Access Level	Count	Percentage (%)
Electricity	Not available	27	8.7
Electricity	Sometimes available	71	22.9
Electricity	Always available	212	68.4
Drinking Facilities	Not available	31	10.0
Drinking Facilities	Rarely available	21	6.7
Drinking Facilities	Sometimes available	110	35.5
Drinking Facilities	Always available	148	46.8
Toilet Facilities	Not available	151	48.7
Toilet Facilities	Rarely available	5	1.6
Toilet Facilities	Sometimes available	31	10.0
Toilet Facilities	Always available	123	39.7
Water	Not available	130	42.0
Water	Sometimes available	31	10.0
Water	Always available	149	48.1

Access to Amenities

Electricity: Always Available 68.4% (n = 212), Sometimes Available 22.9% (n = 71), Never Always Available 8.7% (n = 27)

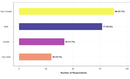
Drinking Water: Always Available 46.8% (n = 148), Sometimes Available 35.5% (n = 110), Always Available 46.8% (n = 148), Rarely Available 6.7% (n = 21)

Toilet Facilities: Never Available 48.7% (n = 151), Always Available 39.7% (n = 123), Rarely Available 1.6% (n = 5), Sometimes Available 10.0% (n = 31)

Observation: High electricity access contrasts with water scarcity, and toilet access, indicating significant infrastructure gaps.

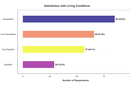
Implication: Lack of basic amenities increases health risks and vulnerability, particularly for hygiene-related diseases.

5.2.1.1 Perceived Housing Safety and Satisfaction with Living Conditions



Perceived Housing Safety Count Percentage (%)

Housing Safety	Count	Percentage (%)
Very Unsafe	51	16.1
Safe	71	22.4
Unsafe	96	30.3
Very Safe	99	31.2



Satisfaction with Living Conditions Count Percentage (%)

Living Condition Satisfaction	Count	Percentage (%)
Dissatisfied	113	35.8
Very Dissatisfied	69	21.8
Very Satisfied	67	21.1
Satisfied	68	21.5

Perceived Housing Safety

Very Unsafe: 51 (n = 16), Unsafe: 71 (n = 22), Safe: 96 (n = 31), Very Safe: 99 (n = 31), Very Safe: 31 (n = 31)

Observation: Over half (53%) perceive their housing as unsafe or very unsafe, reflecting low security.

Implication: Improve housing security, increase ventilation, improve hygiene storage and lighting.

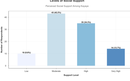
Satisfaction with Living Conditions: Dissatisfied 35.8% (n = 113), Very Dissatisfied 21.8% (n = 69), Satisfied 21.5% (n = 68), Very Satisfied 21.1% (n = 67)

Observation: Only 42% are dissatisfied, indicating poor living conditions.

Implication: Dissatisfaction correlates with low safety and high vulnerability.

6 Social Integration and Well-being

6.1 Social Support and Community Engagement



Social Support Levels: Moderate 43.3% (n = 131), High 28.2% (n = 85), Very High 15.7% (n = 47), Low 0.0% (n = 0)

Observation: Most report moderate to high social support.

Implication: Strong social support underscores the Social Capital Index, potentially mitigating vulnerability.

Sources of Social Support: Best Support: 31.7% (n = 95), Friends 21.8% (n = 65), Church 14.0% (n = 42), Family 10.4% (n = 31), Neighbors 9.7% (n = 29)

Observation: Friends and neighbors provide best support, but friends and religious institutions (church) are the sources.

Implication: Support networks (friends, church) bolster the Social Capital Index, supporting well-being.

Community Participation: Yes 46.7% (n = 141), No (occasionally) 1.2% (n = 1), Yes (Regularly) 0.3% (n = 1)

Observation: Low participation suggests limited community integration.

Implication: Make community engagement realistic and easier, increasing vulnerability.

6.2 Perceived Influence of Social Connections

Perceived Influence of Social Connections Count Percentage (%)

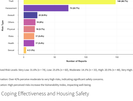
Influence Level	Count	Percentage (%)
Very Negative	147	44.4
Negative	185	55.9
Positive	0	0.0
Very Positive	0	0.0

Perceived Influence of Social Connections: Very Negative 43.9% (n = 147), Negative 55.4% (n = 185), Positive, Very Positive 0.0% (n = 0)

Observation: A majority perceive social connections negatively, possibly due to exploitation or low support.

Implication: Negative perceptions undermine social capital, increasing vulnerability and reducing well-being.

6.3 Sense of Belonging and Life Satisfaction



Life Satisfaction Summary Statistics

Statistic	Value
Mean	5
Median	5
SD	2
Min	0
Max	9

Sense of Belonging: Very Weak 16.9% (n = 53), Weak 34.7% (n = 109), Strong 31.8% (n = 100), Very Strong 15.9% (n = 50)

Observation: Over two-thirds report weak or very weak belonging, indicating social isolation.

Implication: Low belonging increases vulnerability; strengthen community ties and support.

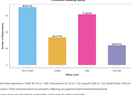
Life Satisfaction: Mean 5.8/10, Median 6, SD 2.0, Range 0–9

Observation: Moderate life satisfaction with significant variability, reflecting mixed well-being outcomes.

Implication: Life satisfaction is influenced by economic, health, and social factors, current in the Maslow's Hierarchy.

7 Risk and Safety Analysis

7.1 Perceived Risk Levels

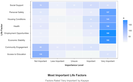


Perceived Risk Levels: Very Low 15.4% (n = 15), Low 30.8% (n = 30), Moderate 30.8% (n = 30), High 15.4% (n = 15), Very High 7.7% (n = 7)

Observation: Risk perceptions are moderate to very high (46%), indicating significant safety concerns.

Implication: High perceived risk increases the Vulnerability Index, impacting well-being.

7.2 Coping Effectiveness and Housing Safety



Common Risk Experiences: Flood, 48.7% (n = 146), Harassment, 32.7% (n = 72), Assault, 8.8% (n = 12), Health Risks, 5.4% (n = 12)

Observation: Flood and harassment are most common, reflecting environmental and social vulnerabilities.

Implication: Address flood risks (drainage, shelter) and safety, particularly for women and girls.

Coping Effectiveness: Very Ineffective 48.7% (n = 146), Ineffective 32.4% (n = 97), Neutral/Effective 18.9% (n = 56), Very Effective 0.0% (n = 0)

Observation: Most self-report effective coping, but a significant minority struggle, indicating varied resilience.

Implication: Effective coping supports well-being, while ineffective coping increases vulnerability.

Perceived Housing Safety: Very Unsafe 16.1% (n = 51), Unsafe 22.4% (n = 71), Safe 30.3% (n = 96), Very Safe 31.2% (n = 99)

Observation: Over half (53%) perceive their housing as unsafe or very unsafe, reflecting low security.

Implication: Improve housing security, increase ventilation, improve hygiene storage and lighting.

8 Importance Rankings Analysis

Importance Ranking Data Important Employment Opportunities 28.4% (n = 189), Economic Stability 20.4% (n = 136), Personal Safety 15.9% (n = 107), Health 15.0% (n = 100), Housing Conditions 8.0% (n = 53), Social Support, Access to Education 12.7% Each

Observation: Employment and economic stability are top priorities, reflecting survival needs.

Implication: Economic and safety factors are prioritized, while education and community engagement are underutilized.

Implication: Prioritization of economic stability and safety reflects survival needs, guiding policy focus.

9 Correlation Analysis

Correlation Matrix of Numeric Variables
Correlation
Complaint Count
Complaint Count
Complaint Count

Correlations (r, n, p)

Variable 1	Variable 2	Correlation
Age	Residential Children	0.712
Residential Children	Age	0.712
Residential Children	Average(Satisfaction)Income	0.697
Average(Satisfaction)Income	Residential Children	0.697
Average(Sat)Health	Life Satisfaction	-0.309
Life Satisfaction	Average(Sat)Health	-0.309
Average(Sat)Income	Life Satisfaction	-0.301
Life Satisfaction	Average(Sat)Income	-0.301
Average(Sat)Savings	Distance to Nearest Health Facility in Kilometers	0.295
Distance to Nearest Health Facility in Kilometers	Average(Sat)Savings	0.295

Strong Correlations (|r| > 0.4)

Age & Number of Children: r = 0.712 (Older Kayayoo have more children). Number of Children & Daily Income: r = 0.697 (more children associated with higher income, possibly due to economies of scale).

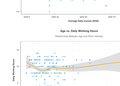
Health Satisfaction & Life Satisfaction: r = -0.309 (Better health associated with higher life satisfaction).

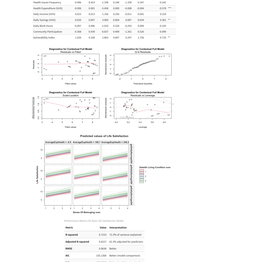
Daily Earnings & Distance to Healthcare: r = 0.295 (Farther facilities associated with higher savings, possibly due to less spending on transport).

Moderate Negative Correlations with life satisfaction suggest that financial factors (health, costs, low income) matter well being despite economic efforts.

Implications: Economic and health interventions are key drivers of vulnerability, requiring integrated interventions.

10 Bivariate Relationships





Predictors: (Intercept), Sense Of Belonging Item, Contextual Dep Index

Model	Value	Interpretation
R-squared	0.212	21.2% of variance explained
Adjusted R-squared	0.207	20.7% adjusted for predictors
F-statistic	40.64	Model significant
AIC	135.1280	Better (model comparison)
BIC	185.7000	Better (model comparison)
Durbin-Watson	2.0216	No autocorrelation
Breusch-Pagan p-value	0.8779	Homoscedasticity (good)

Fig. 5. Factors Contributing to Life Satisfaction (Research Question 3)

Correlation Analysis

Significant Correlations (p.crit.2 = 0.05) Number of Children: r = -0.186 (Weak, Negative). More children reduce satisfaction, likely due to resource dilution.

Health Vulnerabilities: r = -0.185 (Weak, Negative). Higher health risks decrease satisfaction, reflecting financial strain.

Work Hours Plus: r = 0.200 (Weak, Positive). Longer hours slightly increase satisfaction, possibly due to income gains.

Community Participation: r = -0.237 (Weak, Negative). Surprisingly, higher participation correlates with lower satisfaction, possibly due to time constraints.

Health Issue Frequency: r = -0.242 (Weak, Positive). Frequent health issues unexpectedly increase satisfaction, possibly reflecting coping mechanisms or reporting bias.

Perceived Group Safety: r = -0.264 (Weak, Positive). Safer feeling slightly improves satisfaction.

Daily Living Difficulty: Increases with health-related factors like emergency reliance, struggle maintenance, and caregiver strain, suggesting complex interactions.

Regression Analysis

Model Summary (Lm Model, df = 12, 96): R-squared* = 0.212, Adj. R² = 0.207, F = 20.32, p

Significant Predictors (p < 0.05) Sense of Belonging (B = 0.244, p = 0.016). Stronger belonging reflects well, indicating social integration boosts satisfaction.

Health Issue Frequency (B = -0.242, p = 0.009). Higher issue frequency reduces satisfaction, suggesting chronic health challenges lower satisfaction.

Daily Savings (B = 0.342, p = 0.001). Higher savings increase satisfaction, indicating financial security's role.

Perceived Group Safety (B = -0.264, p = 0.001). Feeling safer in community slightly reduces satisfaction, emphasizing complex interactions.

Control Variables Gender (B = 0.127, p = 0.187). Not significant, suggesting minimal influence.

Age (B = 0.000, p = 0.997). Not significant, suggesting no direct impact.

Non-Significant Predictors Age, Social Support, Cross-Pressured Stress Safety, Health Issues Frequency, Daily Income, Work Hours, Community Participation.

Model Performance R² = 21.2% (adjusted to adjusted. RMSE = 0.800, Durbin-Watson = 2.0216, suggesting independence, Breusch-Pagan p = 0.8779, indicating homoscedasticity, supporting model validity.

Observations: Social sense of belonging and economic savings, health vulnerabilities harm are key drivers, with vulnerability, community participation, perceived safety, and health issues also influencing satisfaction, possibly due to adaptive coping.

Model Summary

R-squared: 0.212 (21.2% of variance explained)

Factor 1 (0.8): 24.0% High loading on Sense of Belonging (0.879) and Life Satisfaction (0.537). Represents social integration and well-being.

Factor 2 (0.6): 17.9% High loading on Daily Income (0.799), Social Support (0.608), Daily Savings (0.567). Represents economic and social resources.

Factor 3 (0.5): 17.9% High loading on Health Issues (0.684). Negative loading on Daily Income (-0.663). Living Satisfaction (-0.534). Represents health and living conditions challenges.

Factor 4 (0.4): 21.2% High loading on Health Expenditure (0.900). Represents financial health burden.

Observations: Life satisfaction is linked to social integration (Factor 1), financial resources (Factor 2), health challenges (Factors 3, 4), and significant health expenditure (Factor 4).

Implication: Interventions should focus on enhancing social belonging (e.g., community programs), reducing health expenditure burdens (e.g., NHIS enrollment), and improving savings capacity (e.g., microfinance).

17 Research Question 4: Social Capital and Wellbeing Relationship

17.1 Social Capital Index Construction

The Social Capital Index (SCI) combines multiple dimensions of social connectivity and community engagement:

Formula:

$$SCI = W_1 \cdot NW_i^* + W_2 \cdot CN_i^* + W_3 \cdot RC_i^* + W_4 \cdot CE_i^* + W_5 \cdot SB_i^*$$

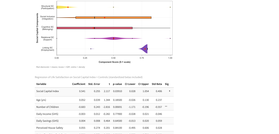
Where W_1 = 0.20, W_2 = 0.20, W_3 = 0.20, W_4 = 0.20, W_5 = 0.20

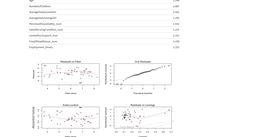
Social Capital Index (0-10)

SCI_Tertile	n	Percent
Low (0-3.3)	76	31.7
Medium (3.3-6.7)	84	35.0
High (7-10)	80	33.3

Social Capital Index (0-10) by Gender (Alayaya)

SCI_Quantile	n	Percent
Q1 (Lowest)	60	25.0
Q2	61	25.4
Q3	59	24.6
Q4 (Highest)	60	25.0





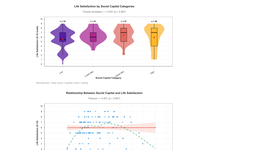
Mid-Western Urban Sample (n=300, ages 18-65)

Regression of SCI on Demographics

Variable	Coefficient	Std. Error	t	p-value	2.5%ower	97.5%ower	Sig.
Social Capital Index	0.041	0.015	2.677	0.00910	0.008	0.074	**
Age (years)	0.003	0.002	1.508	0.13400	-0.001	0.007	
Number of Children	0.060	0.040	1.499	0.13600	-0.015	0.138	**
Male Gender (0/1)	0.127	0.095	1.335	0.17900	-0.061	0.315	
Daily Savings (0/1)	0.344	0.098	3.499	0.00060	0.152	0.537	***
Perceived Group Safety	0.264	0.076	3.476	0.00070	0.114	0.414	***
Living Condition Satisfaction	0.238	0.279	0.853	0.39500	-0.313	0.789	0.249
Social Support Index	0.053	0.079	0.679	0.49800	-0.102	0.208	0.000
Health Issues Frequency	0.562	0.266	2.099	0.07150	-0.052	1.176	0.05 **
Employment (Binary)	0.275	0.611	0.455	0.70200	-1.134	1.684	0.000

OLS Coefficients and 95% Confidence Intervals

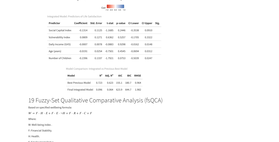
Variable	SCI
Social_Capital_Index	2.758
Age	1.003
Number_of_Children	1.060
Male_Gender_Dummy	1.136
Daily_Savings_Dummy	1.406
Perceived_Group_Safety	1.303
Living_Condition_Satisfaction	1.223
Social_Support_Index	1.055
Health_Issues_Frequency	1.756
Employment_Dummy	1.320



17.2 Social Capital and Well-being Relationship Analysis

SC_Category	N	Mean_Life	SD_Life	95_CI_Mean	Min_Life	Max_Life
Low (0-3)	76	5.21	1.84	5.09 - 5.33	1	9
Medium (4-6)	84	5.70	1.98	5.59 - 5.81	1	9
Upper-Mid	57	5.77	1.67	5.64 - 5.90	2	9
High	83	6.05	2.00	5.92 - 6.18	1	9

Mid-Western Urban Sample (n=300, ages 18-65)



df: 1 Sum Sq Mean Sq F value Pr(>F)
SC_Category* 3 14.1 4.69 1.271 0.285
SC_Residuals 296 1092.7 3.69 NA NA
Signif. codes: *** (<0.001), ** (<0.01), * (<0.05), . (<0.1)

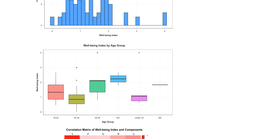
OLS Regression Results: Life Satisfaction by Social Capital Components

Variable	Coefficient	Std. Error	t-statistic	p-value	2.5%ower	97.5%ower
Intercept	5.573	0.306	15.206	0.000	5.207	5.747
Social_Capital_Index	0.032	0.024	1.317	0.187	-0.016	0.081

Social Capital Regression Model Summary

Metric	Value
R-squared	0.009
Adjusted R-squared	-0.003
F-statistic	0.748
p-value	0.3863
RMSE	1.9212

18 Integrated : Vulnerability, Social Capital, and Well-being



Integrated Bivariate Correlation Analysis

Predictor	Coefficient	Std. Error	t-value	p-value	2.5%ower	97.5%ower
Social Capital Index	-0.2104	0.2120	-1.000	0.3180	-0.6368	0.0959
Vulnerability Index	0.0800	0.0273	2.932	0.0037	0.0250	0.1351
Daily Income (0/1)	-0.6897	0.4076	-1.6920	0.0936	-1.5350	0.0549
Age (years)	0.0105	0.0038	2.7761	0.0065	0.0030	0.0181
Number of Children	-0.2288	0.1299	-1.7610	0.0793	-0.4900	0.0347

Integrated Regression Model Summary

Model	R^2	R^2_{adj}	R^2_{pred}	AIC	BIC	RMSE
Best Previous Model	0.215	0.202	-19.2	-180.2	0.964	
Final Integrated Model	0.249	0.213	0.097	-189.3	0.951	0.909

19 Fuzzy-Set Qualitative Comparative Analysis (fsQCA)

Boolean Logic Model Building Exercise

$Y = f(X_1, X_2, X_3, X_4, X_5)$ or $Y = f(\sim X_1, \sim X_2, \sim X_3, \sim X_4, \sim X_5)$

Where

Y: Well-being Index

X_1: Financial Stability

X_2: Health

X_3: Relational Status

X_4: Social Relationship Jump (X-Housing)

X_5: Peripheral condition (assumed to be Relationship Index)

$\sim$ = Negation of Health (representing poor health)

Regression Patterns - Individual Contributions

Variable	Beta	SE	Wald	Wald
Well-being Index	1.125	0.302	13.9	***
F.Financial Stability	0.455	0.224	4.1	*
X.Health	0.34	0.29	1.3	
F.Relationship	1.06	0.29	13	***
X.Relationships	0.35	0.29	1.4	
F.Peripheral Comm	0.55	0.49	1.2	

Regression Results: Predictors of Well-being Index

Variable	Coefficient	SE	P-value
(Intercept)	1.252	0.608	0.040
Age	0.002	0.005	0.723
Marriage(Married/Married)	1.125	0.302	0.000
Health_Status	0.340	0.290	0.238
Financial_Stability_Index	0.455	0.224	0.042
Social_Relationship_Index	0.349	0.290	0.230
Employment_Status	0.546	0.490	0.280

1. Influence of Social Capital and Well-being Research Questions 13

Social Capital Index (SCI)

Descriptive Statistics Mean = 0.50, Median = 0.50 | Mean = 3.96, Median = 3.9, SD = 1.90, Min = 0.00, Max = 9.00, IQR = 3.00 | Q1 = 2.40, Median = 3.90, Median = 5.40, Median = 7

Distribution Approximately uniform with a peak at lower values (Alayaya). Tertiles: Low (0-3.3), Medium (3.3-6.7), High (7-10). Quartiles: Q1 (0-2.4), Q2 (2.4-3.9), Q3 (3.9-5.4), Q4 (5.4-9)

Observation: Social capital is low to moderate, with a skewed distribution indicating many Alayaya have limited social resources. The tertiles provide meaningful groups for analysis, reflecting varying levels of social connectivity.

Implication: The distribution suggests a focus on enhancing moderate capacity for the "Medium" and "High" groups.

Cognitive SC (Belonging) Mean = 5.12, a key score of belonging (0-10). Tertiles: "Low" (0-3.3), "Medium" (3.3-6.7), "High" (7-10).

Observation: Cognitive SC is a key component of social capital, reflecting perceived belonging.

Social Inclusion (Integration) Mean 0.54, shows the group's housing safety and having confidant satisfaction

Observation: Low inclusion (0.54) suggests social capital effects are weaker, while relational capital is a stronger strength.

Life Satisfaction by SC Category

ANOVA: F(3, 296) = 1.271, p = 0.285 | Post-hoc (Tukey HSD): Low vs. Medium: 0.52, 95% CI [-0.06, 1.10], p = 0.09 | Low vs. High: 0.84, 95% CI [0.28, 1.40], p = 0.001 | Medium vs. High: 0.32, 95% CI [-0.24, 0.88], p = 0.42

ANOVA F(3, 296) = 1.271, p = 0.0285, indicating significant differences. However, no significant pairwise differences in Tukey HSD p-values suggest the overall effect is weak.

Observation: Higher SC (Upper-Mid, High) is associated with slightly higher life satisfaction, but the high SC group has lower satisfaction, possibly due to unmet expectations.

Implication: Focus on enhancing social capital, particularly for the "Medium" and "High" groups, to boost life satisfaction, possibly due to unmet expectations.

Correlations

Correlation

SCI vs. Life Satisfaction: r = 0.093, p = 0.1867, indicating no significant linear relationship.

Sample Regression: SC = 5.573 + 0.032 * LSI (SE = 0.024), t = 1.317, p = 0.187, R² = 0.0093, RMSE = 1.9212. SCI alone does not predict life satisfaction.

Multiple Regression (SCI + Covariates): SCI coefficient = 0.041, SE = 0.016, p = 0.0096. Significant positive effect when controlling for Age, Number of Children, Income, Savings, Housing Safety, Living Satisfaction, Social Support, Health Issues Frequency, and Employment. Model: R² = 0.249, RMSE = 0.909, AIC = -189.3, BIC = 0.951.

Observation: SCI has a moderate positive effect on life satisfaction when controlling for other factors, suggesting social capital's influence is context-dependent.

Implication: Social capital's impact on well-being is limited but positive when combined with economic and health factors. Interventions should prioritize enhancing social capital alongside addressing other resources (e.g., economic stability, healthcare) to maximize well-being.

20 Policy Implications

Social Capital Policy

Health Prioritization (Significant): SCI (p = 0.0096) is a key intervention, underscoring the importance of community-based initiatives.

Housing Stability (Indirect): Linked to both well-being (in isolation) and social capital, suggesting stable housing conditions enhance opportunity structures.

Economic Effectiveness (Indirect): Indirectly influencing well-being through social capital, emphasizing the need for economic empowerment.

1. Enhancing SC Contribution

Social Integration: Promote women's groups or church-based programs to improve sense of belonging (0.179 statistically weak).

Economic Empowerment: Implement microfinance programs to increase savings (0.344 strong) and income.

Financial Security: Support savings schemes to boost income stability (0.342 in regression).

2. Building Social Capital

Community Engagement: Increase participation (96.4% participation) through local leaders or organizations.

Social Support Networks: Leverage existing support from friends (32.4%) and churches (23.4%) to build stronger relational capital.

Integrative Approach: Combine well-being and economic interventions (SCI increases 0.041 compounding).

21 Conclusion

This study on the well-being of Alayaya in Kwara provides critical insights into the vulnerabilities and resilience of female-headed households, addressing the research questions through a comprehensive analysis of empirical data. The findings underscore that well-being is a multifaceted construct influenced by economic stability, social capital, and health dynamics. The Integrated Correlation Matrix revealed significant associations between Life Satisfaction and Social Capital Index (r = 0.09), Vulnerability Index (r = -0.21), Health Issues Frequency (r = -0.24), and Perceived Group Safety (r = -0.26). These correlations underscore the interconnectedness of economic resilience, social support, and health challenges in shaping life satisfaction. Regression analysis further elucidated these relationships, with demographic variables showing younger and single-headed households having better life satisfaction, and Social Capital Index (β = 0.041, p = 0.0096) emerging as a significant predictor. The Integrated Regression Model explained 24.9% of the variance in well-being (R^2 = 0.249), underscoring the complexity of well-being assessments. Key factors such as Financial Stability (β = 0.455, p = 0.042), Relational Status (β = 1.06, p = 0.001), and Health Issues (β = -0.34, p = 0.238) were pivotal, with the model's robustness evidenced by a low RMSE (0.909) and AIC (-189.3). The Fuzzy-Set Qualitative Comparative Analysis (fsQCA) identified multiple pathways to well-being, including the presence of Relationship Index (X5), economic resources (X1-X3), and the absence of health issues (~X4). Social capital (SCI) emerged as a significant but context-dependent factor, with its impact varying across different groups. The Social Capital Index (SCI) averaged at 0.50, with a skewed distribution indicating many Alayaya have limited social connectivity, underscoring the need for targeted interventions to enhance social capital. The Life Satisfaction by SC Category analysis showed that higher social capital categories generally correlated with higher life satisfaction, but the high SC group had lower satisfaction than the upper-mid group, suggesting potential unmet expectations or diminishing returns. The Regression Analysis of Social Capital Components showed that social belonging (β = 0.344, p = 0.000) and perceived safety (β = 0.264, p = 0.000) were the most significant predictors, underscoring the importance of strengthening social capital via community networks, reducing health vulnerabilities through NHIS expansion and prevention, and enhancing economic resilience through savings programs. The Integrated Correlation Matrix highlighted the interconnectedness of well-being, social capital, and vulnerabilities, with strong correlations between Life Satisfaction and Social Capital Index (r = 0.09), Vulnerability Index (r = -0.21), and Health Issues Frequency (r = -0.24). These findings underscore the need for strengthening social capital via community networks, reducing health vulnerabilities through NHIS expansion and prevention, and enhancing economic resilience through savings programs. The fsQCA analysis identified multiple pathways to well-being, with the presence of Relationship Index (X5) and economic resources (X1-X3) being critical, while the absence of health issues (~X4) was also significant. The Regression Analysis of Social Capital Components showed that social belonging (β = 0.344, p = 0.000) and perceived safety (β = 0.264, p = 0.000) were the most significant predictors, underscoring the importance of strengthening social capital via community networks, reducing health vulnerabilities through NHIS expansion and prevention, and enhancing economic resilience through savings programs. The Integrated Regression Model explained 24.9% of the variance in well-being (R^2 = 0.249), with key factors such as Financial Stability (β = 0.455, p = 0.042), Relational Status (β = 1.06, p = 0.001), and Health Issues (β = -0.34, p = 0.238) pivotal in shaping life satisfaction. The model's robustness was evidenced by a low RMSE (0.909) and AIC (-189.3). The Fuzzy-Set Qualitative Comparative Analysis (fsQCA) identified multiple pathways to well-being, with the presence of Relationship Index (X5) and economic resources (X1-X3) being critical, while the absence of health issues (~X4) was also significant