



Rural-urban health disparities among older adults in South Africa

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Background

- Non-communicable diseases (NCDs) have become one of the world's biggest public health problems.¹
- **Aging** is often associated with **decline in health status** characterized by limited physical functioning, increase in chronic diseases as well as decrease in cognitive functioning.^{2,3}
- **Social determinants** of non-communicable diseases include socioeconomic factors (e.g., poverty, inequality, **rural-urban differences**)⁴ and risky health behavioural repertoire.²⁻⁴

Background

Rural-urban health disparities persist in terms of sociodemographics, health care access, health status, and prevalence of chronic conditions.

Sociodemographics.

Rural older adults:

- younger, more likely to be women, widowed
- lower education and income (China)⁵
- <hypertension, <diabetes (South Africa)⁷

Health care access.

Urban residence:

→better access to health care (hospital admission, private transport to health facility, shorter travel distance to health facility, private out-patient care, less often experienced catastrophic health care costs and utilization of higher-level public facilities)(South Africa).⁸

Background

Health status

rural older dwellers:

<overall health status

<quality of life than urban ones^{5,6,9}

<level of cognitive function¹⁰

>cognitive impairment¹¹

>functional limitation (China)¹²

<functional disability (Bangladesh)¹³

>sarcopenia¹²

Background

Urban residence:

>prevalence of asthma morbidity,¹⁵

>chronic lung disease,¹⁶

>stroke,¹⁷ angina,¹⁶ hypertension,^{16,17} and diabetes.^{7,15,16,18}

<underweight or malnutrition.^{6,19}

>Overweight or obesity (Iran)¹⁹ (South Africa)⁷ <USA²⁰

>Poor oral health, edentulism (Ghana).²¹

Background

Mental health

Urban residence:

> & <depression (China)^{16,5,22}

Health risk behaviours

Urban residence:

>alcohol use^{7,18}

<vigorous physical activity (South Africa)²³

<tobacco use (India)²⁴

Background

There is a dearth of studies examining rural-urban differences in health at older ages in the African continent, including South Africa.¹⁸

This study examines rural-urban differences among older South Africans who participated in the Study of Global Ageing and Adults Health (SAGE).

The study provides critical evidence in terms of rural-urban health disparities in relation to health status and chronic conditions among older adults for health policy planning for South Africa, the fastest aging country in the African continent.

Methods-Design

- Cross-sectional data from SAGE,
- a population-based study
- sample of 3840 older South Africans aged 50+ years.
- A two-stage probability sample was used and it that produced representative estimates nationally and provincially by geographic type (urban and rural) and population group (Black, Coloured, Indian or Asian and White);

Methods-Measures

Health risk behaviours (daily tobacco use, problem drinking (≥ 10 drinks/week), physical inactivity (< 600 metabolic equivalent-minutes per week), and inadequate fruit and vegetable consumption (< 5 servings a day).

Health status variables: poor self-reported health status (bad or very bad general health), weak grip strength (< 30 kg for men and < 20 kg for women), functional disability (according to the International Classification of Functioning, Disability and Health, 50-100% were defined as severe or extreme functional disability, using the 12-item WHO Disability Assessment Schedule, version 2 (WHODAS-II), high cognitive functioning (a median score of 48 or more) and low quality of life (lowest tertile score) (assessed with the eight-item “World Health Organization Quality of Life” scale).

Measures

Chronic conditions: arthritis (symptoms algorithm based), asthma (self-reported diagnosed and/or symptoms algorithm based), lung disease and depression (symptoms algorithm based, according to the International Classification of Diseases tenth revision diagnostic criteria for research for depressive episodes), obesity (standard height and weight measures, ≥ 30 kg/m²), and diabetes, stroke, angina and edentulism (self-reported diagnoses), anxiety (severe or extreme), sleeping problems (severe or extreme) (self-reported), measured hypertension (based on three averaged blood pressure measurements and/or taking antihypertensive medication) and measured low vision using a tumbling “E” log MAR chart.²⁷

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Data analysis

Odds Ratios (OR) were used to determine associations between exposure (socio-demographics and health risk behaviours) and outcome (health status and chronic conditions) variables using multivariable logistic regression;

Adjusted for age, sex, population group, education, wealth, tobacco use, alcohol use, physical inactivity and fruit and vegetable consumption

Results

Exposure variables by rural-urban residence (N=3840)

Variable	Rural	Urban	p-Value
	n=1276	n=2561	
	M (SD)	M (SD)	
Age	63.6 (10.2)	62.3 (9.4)	<0.001
	n (%)	n (%)	
Sex			
Female	715 (57.1)	1485 (55.2)	0.404
Male	561 (42.9)	1076 (44.8)	
Population group			
Black African	920 (90.8)	1131 (64.8)	0.003
White African	51 (4.0)	218 (12.2)	
Coloured	110 (3.8)	545 (17.8)	
Indian/Asian African	22 (1.5)	285 (5.1)	
Education			
<7 years	785 (70.7)	901 (41.3)	<0.001
8-11	205 (21.5)	846 (38.2)	
12 or more	76 (7.7)	339 (20.5)	
Wealth			
Low	722 (58.8)	(30.7)	<0.001
Medium	250 (19.7)	(17.4)	
High	299 (21.5)	(51.8)	
Marital status			
Not married, single, widowed	129 (13.0)	383 (15.0)	0.666
Married, cohabiting	1115 (87.0)	2139 (85.0)	
Daily tobacco use	285 (21.7)	523 (19.7)	0.602
Problem drinking	47 (3.1)	111 (4.1)	0.414
Physical inactivity	780 (58.1)	1673 (61.8)	0.674
Inadequate fruit and vegetable consumption	1048 (75.1)	1782 (64.9)	0.268

Prevalence of health status and chronic conditions by rural-urban residence

Variable	Rural	Urban
	n (%)	n (%)
Health status		
Poor self-rated health	230 (22.3)	386 (14.9)
Quality of life (low)	385 (36.2)	571 (24.3)
Grip strength (weak)	242 (28.0)	537 (28.4)
Functional disability (severe)	142 (14.6)	223 (9.2)
Cognitive functioning (high)	471 (38.9)	1322 (58.9)
Physical chronic conditions		
Arthritis	294 (25.9)	757 (29.8)
Asthma	115 (12.1)	254 (11.7)
Lung disease	86 (6.4)	153 (6.4)
Hypertension	916 (77.5)	1923 (77.2)
Underweight	65 (5.8)	120 (4.1)
Obesity	445 (42.5)	1118 (49.3)
Diabetes	62 (5.6)	297 (11.1)
Stroke and/or angina	93 (7.6)	245 (9.1)
Edentulism	44 (3.5)	324 (11.1)
Low vision	502 (43.4)	1060 (43.1)
Mental health		
Depression	38 (3.7)	80 (2.5)
Anxiety	119 (11.5)	171 (8.5)
Nocturnal sleep problem	123 (10.8)	205 (8.5)

Odds ratios for health status by rural-urban residence

	Rural (n=2202)	Urban (n=1638)	
		OR (95% CI)	P value
Health status			
Poor self-rated health			
Unadjusted	1 (Reference)	0.61 (0.26, 1.46)	0.260
Adjusted ¹	1 (Reference)	0.77 (0.38, 1.55)	0.453
Quality of life (low)			
Unadjusted	1 (Reference)	0.57 (0.31, 1.05)	0.068
Adjusted ¹	1 (Reference)	0.78 (0.44, 1.39)	0.389
Grip strength (weak)			
Unadjusted	1 (Reference)	1.02 (0.62, 1.69)	0.939
Adjusted ¹	1 (Reference)	1.05 (0.65, 1.71)	0.831
Functional disability (severe)			
Unadjusted	1 (Reference)	0.60 (0.21, 1.69)	0.322
Adjusted ¹	1 (Reference)	0.65 (0.23, 1.89)	0.423
Cognitive functioning (high)			
Unadjusted	1 (Reference)	2.25 (1.40, 3.63)	<0.001
Adjusted ¹	1 (Reference)	1.91 (1.27, 2.85)	0.002

Odds ratios for chronic conditions by rural-urban residence

Chronic conditions			
Arthritis			
Unadjusted	1 (Reference)	1.22 (0.78, 1.90)	0.381
Adjusted ¹	1 (Reference)	1.22 (0.83, 1.80)	0.302
Asthma			
Unadjusted	1 (Reference)	0.96 (0.62, 1.49)	0.865
Adjusted ¹	1 (Reference)	0.97 (0.70, 1.44)	0.838
Lung disease			
Unadjusted	1 (Reference)	1.00 (0.51, 1.95)	0.998
Adjusted ¹	1 (Reference)	1.01 (0.56, 1.82)	0.962
Hypertension			
Unadjusted	1 (Reference)	0.98 (0.59, 1.64)	0.952
Adjusted ¹	1 (Reference)	1.00 (0.67, 1.49)	0.995
Obesity			
Unadjusted	1 (Reference)	1.31 (0.83, 2.09)	0.240
Adjusted ¹	1 (Reference)	1.25 (0.77, 2.01)	0.353
Underweight			
Unadjusted	1 (Reference)	0.82 (0.49, 1.37)	0.437
Adjusted ¹	1 (Reference)	0.79 (0.37, 1.69)	0.537

Odds ratios for chronic conditions by rural-urban residence

Diabetes			
Unadjusted	1 (Reference)	2.11 (1.48, 3.01)	<0.001
Adjusted ¹	1 (Reference)	2.36 (1.37, 4.04)	0.003
Stroke and/or angina			
Unadjusted	1 (Reference)	1.21 (0.82, 1.77)	0.324
Adjusted ¹	1 (Reference)	0.94 (0.63, 1.40)	0.743
Edentulism			
Unadjusted	1 (Reference)	3.43 (1.50, 7.87)	0.004
Adjusted ¹	1 (Reference)	2.79 (1.27, 6.09)	0.012
Low vision			
Unadjusted	1 (Reference)	0.99 (0.61, 1.61)	0.964
Adjusted ¹	1 (Reference)	0.86 (0.55, 1.35)	0.508
Depression			
Unadjusted	1 (Reference)	0.66 (0.33, 1.32)	0.233
Adjusted ¹	1 (Reference)	0.73 (0.33, 1.64)	0.436
Anxiety			
Unadjusted	1 (Reference)	0.73 (0.35, 1.55)	0.406
Adjusted ¹	1 (Reference)	0.82 (0.45, 1.50)	0.516
Nocturnal sleep problems			
Unadjusted	1 (Reference)	0.68 (0.32, 1.47)	0.317
Adjusted ¹	1 (Reference)	0.82 (0.44, 1.55)	0.539

Discussion

Rural older adults in this study were predominantly Black African (90.8%), while urban ones were proportionally more white and Coloured (30%). As found in previous studies in developing countries, such as China,^{5,6} rural older adults in this study had less education and were less wealthy than urban older adults were.

This could mean that rural older adults have less access to health care services than urban dwellers, and health care access should be improved for rural older adults in South Africa.⁸

Discussion

Consistent with previous studies,^{10,11} this study found higher cognitive functioning in urban compared to rural older adults. Better cognition in later life has been associated with higher levels of education.^{29,30} Our urban sample had much more formal education than the rural sample, which may explain the higher levels of cognitive functioning among the urban older adults. It is possible that early and later life transitions of migration to urban areas, seeking and receiving higher levels of education impacted on the levels of cognitive functioning in South Africa.¹⁰ Further studies should validate these findings and develop explanatory models that could help in describing the mechanisms responsible for the found associations

Discussion

Health status, this study found that poor self-rated health and low quality of life was higher among rural than urban older adults, but this was not significantly higher.

Previous studies found that rural subjects reported significant lower overall health status and lower quality of life than urban dwellers.^{5,6,28}

Poorer perceived health status and lower quality of life in rural dwellers may be related to lower socioeconomic status and higher unemployment, which in turn reduce affordability of good nutrition and access to health care .⁹

This highlights the importance of an integrated national development plan in which the provision of health is not in isolation but situated within a larger developmental context

Discussion

Chronic conditions, urban residence was significantly associated with diabetes and edentulism in this study, as found in previous studies.^{15,16,21}

The higher self-reported prevalence of diabetes in urban than rural areas may be related to a higher prevalence of combined risk factors, such as dietary changes, physical inactivity and obesity¹⁶ and older adults in rural areas may have less access to being diagnosed with diabetes than in urban areas.¹⁶

Possible reasons for the higher prevalence of edentulism in urban areas may be related to dietary changes such as increased consumption of refined sugars, which may lead to caries and tooth loss,²¹ and dental care services and tooth extractions are more likely to be available in urban than rural areas.

Discussion

The study found that the prevalence of underweight was higher in rural than urban older adults, while the prevalence of obesity was higher among urban than rural older adults, but the differences did not reach significant levels. Previous studies^{6,19} confirm the relationship between rural residence and underweight or malnutrition among older adults, while mixed results were found on urban-rural differences in relation to obesity.^{7,1}

Discussion

Previous studies^{5,16,22} found mixed results regarding rural-urban differences and mental health indicators such as depression, while this study did not find significant differences for depression, anxiety and nocturnal sleep problems.

Surprisingly, contrary to some previous studies,^{7,23-25} no rural-urban differences were found for behavioural risk factors of NCDs (tobacco use, problem drinking, physical inactivity and insufficient fruit and vegetable consumption).

This could mean that health risk behaviours, such as tobacco use, problem drinking, physical inactivity and inadequate fruit and vegetable consumption, have penetrated into both urban and rural areas in South Africa. Therefore, health behaviour interventions should target rural and urban dwellers equally.

Gender differences

	Women (n=2202)	Men (n=1638)	
			OR (95% CI) P value
Health status			
Poor self-rated health			
Unadjusted	1 (Reference)	0.97 (0.76, 1.23)	0.800
Adjusted ¹	1 (Reference)	1.16 (0.78, 1.73)	0.450
Quality of life (high)			
Unadjusted	1 (Reference)	1.31 (1.03, 1.66)	0.411
Adjusted ¹	1 (Reference)	1.05 (0.76, 1.44)	0.773
Grip strength (weak)			
Unadjusted	1 (Reference)	2.10 (1.40, 3.15)	<0.001
Adjusted ¹	1 (Reference)	1.99 (1.30, 3.05)	0.002
ADL-severe			
Unadjusted	1 (Reference)	0.96 (0.62, 1.48)	0.852
Adjusted ¹	1 (Reference)	1.07 (0.66, 1.74)	0.779
IADL-severe			
Unadjusted	1 (Reference)	0.72 (0.57, 0.91)	0.007
Adjusted ¹	1 (Reference)	0.84 (0.58, 1.23)	0.365
Cognitive functioning (high)			
Unadjusted	1 (Reference)	1.50 (1.00, 2.23)	0.001
Adjusted ¹	1 (Reference)	1.50 (1.00, 2.23)	0.001

Gender differences

	Women (n=2202)	Men (n=1638)	
		OR (95% CI)	P value
Chronic conditions			
Arthritis			
Unadjusted	1 (Reference)	0.60 (0.47, 0.75)	<0.001
Adjusted ¹	1 (Reference)	0.52 (0.41, 0.67)	<0.001
Lung disease			
Unadjusted	1 (Reference)	0.68 (0.45, 1.04)	0.074
Adjusted ¹	1 (Reference)	0.67 (0.49, 0.91)	0.012
Obesity			
Unadjusted	1 (Reference)	0.59 (0.48, 0.72)	<0.001
Adjusted ¹	1 (Reference)	0.57 (0.43, 0.75)	<0.001
Underweight			
Unadjusted	1 (Reference)	1.56 (0.87, 2.82)	0.111
Adjusted ¹	1 (Reference)	2.17 (1.31, 3.60)	0.004
Diabetes			
Unadjusted	1 (Reference)	0.60 (0.44, 0.83)	0.002
Adjusted ¹	1 (Reference)	0.48 (0.31, 0.77)	0.003
Anxiety			
Unadjusted	1 (Reference)	0.68 (0.47, 0.99)	0.045
Adjusted ¹	1 (Reference)	0.51 (0.28, 0.92)	0.026

Conclusions

- There are some rural-urban health disparities in South Africa, i.e. urban dwellers had a higher prevalence of diabetes, edentulism and cognitive functioning than rural ones.
- Understanding these rural-urban health variations may help in developing better strategies to improve health across geolocality in South Africa.

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