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RESEARCH

ARTHRITIS AND ASSOCIATED FACTORS IN OLDER ADULTS IN SOUTH AFRICA

ABSTRACT

Introduction: Arthritis is one of the more prevalent chronic conditions and a leading cause of disability in the elderly. The objective of this study is to assess the prevalence and to identify the factors associated with arthritis in a national probability sample of older South Africans who participated in the Study of Global Ageing and Adults Health (SAGE) in 2008.

Materials and Method: We conducted a national population-based cross-sectional study with a sample of 3840 aged 50 years or older in South Africa in 2008. The questionnaire included socio-demographic characteristics, health variables, anthropometric and blood pressure measurements. Multivariable regression analysis was performed to assess the association of socio-demographic factors, health variables and arthritis.

Results: Overall 24.7% had self-reported diagnosed arthritis, 28.4% symptom-based arthritis; and of those who had self-reported diagnosed arthritis 77.3% were undergoing routine ongoing therapy in the past 12 months and 67.6% were under current therapy (in past 2 weeks) for arthritis. In multivariable analysis female gender, Coloured, Indian or Asian population group, other illness or chronic conditions (Stroke, Depression, Sleeping problem, Diabetes and Obesity), poorer subjective health status, greater activity limitations and low quality of life were associated with self-reported arthritis.

Conclusion: Considering the paucity of similar studies addressing the impact of arthritis in Africa, these findings may be applied to similar communities and support better planning of resource allocations to minimize the effects of arthritis among the elderly.

Key Words: Arthritis; Chronic Disease; Aged; South Africa.



ARAŞTIRMA

GÜNEY AFRIKA'DAKİ YAŞLI BİREYLERDE ARTRİT VE İLİŞKİLİ FAKTÖRLER

Öz

Giriş: Artrit yaşlılarda yaygın bir kronik durumdur ve engelliliğin başlıca nedenlerinden biridir. Bu çalışmanın amacı, 2008 yılında Küresel Yaşlanma ve Erişkin Sağlığı Çalışmasına (SAGE, Study of Global Ageing and Adults Health) katılan Güney Afrikalı yaşlı bireyleri içeren bir ulusal olasılık örnekleminde artritin prevalansını değerlendirmek ve ilişkili faktörleri belirlemektir.

Gereç ve Yöntem: Güney Afrikada 2008 yılında 50 yaş ve üzeri 3840 kişiden oluşan bir örnekleme ulusal toplum temelli, çapraz kesitsel bir çalışma yaptık. Araştırmada, sosyodemografik özellikler, sağlık değişkenleri, antropometrik ölçümler ve kan basıncı ölçümleri incelendi. Sosyodemografik faktörler, sağlık değişkenleri ve artrit arasındaki ilişkiyi değerlendirmek için çok değişkenli regresyon analizi yapıldı.

Bulgular: Toplamda hastaların %24.7sinde hasta tarafından bildirilen tanı konulmuş artrit, %28.4'ünde semptomlara dayalı artrit vardı. Hasta tarafından bildirilen tanı konulmuş artriti olan grubun %77.3'ü önceki 12 ayda artrit için rutin tedavi görüyordu, %67.6'sı halen artrit tedavisi (son 2 haftada) görüyordu. Çok değişkenli analize göre kadın cinsiyet, Siyah, Hintli ve Asyalı popülasyon grubu, diğer hastalıklar veya kronik durumlar (İnme, depresyon, uyku problemi, diyabet ve obezite), subjektif sağlık durumunun daha kötü olması, daha fazla aktivite kısıtlaması bulunması ve yaşam kalitesinin düşüklüğü hasta tarafından bildirilen artrit ile ilişkiliydi.

Sonuç: Artritin Afrika'daki etkisini ele alan benzer çalışmaların azlığı düşünüldüğünde, bu bulgular benzer toplumlar için geçerli kabul edilebilir ve yaşlılarda artritin etkilerini en aza indirmek için kaynak dağıtımının daha iyi planlanmasına yardımcı olabilir.

Anahtar Sözcükler: Artrit; İlişkili Faktörler; Yaşlı; Güney Afrika.

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INTRODUCTION

Arthritis is a musculoskeletal disorder that occurs in one or more joints, causing pain, immobility and stiffness. Arthritis is a major contributor to disability among older people (1). Prevalence rates of arthritis have been found to be high in the older population in high-income countries (25%-44%) (2) and in middle income countries such as Brazil (25.3%) (3). In the last population survey in 2003 in South Africa, arthritis presented in both men (13%) and women (18%) as the second-most (after high blood pressure) commonly reported chronic condition among older adults (4). Various factors have been identified as associated with arthritis: women (1,3), lower socioeconomic status (less education, lower income and less wealth) (2,3), race (5) limitations in activities of daily living (2,6,7), poor self-rated health (6), poorer health related quality of life (QoL) (8,9), mental health problems (6,10), sleep complaints (6), Body Mass Index (6) report of myocardial infarct, stroke symptoms (6).

The study aims to investigate self-reported doctor diagnosed arthritis and associated factors in a national probability sample of older South Africans who participated in the Study of Global Ageing and Adults Health (SAGE) in 2008. Estimating the burden in the South African older adult population that comprise arthritis is important for understanding their current and potential future impact on the health care and public health systems. Equally important is identifying the gaps in our understanding of burden.

MATERIALS AND METHOD

Sample and Procedure

We conducted a national population-based cross-sectional study with a sample of 3840 aged 50 years or older in South Africa in 2008. The SAGE sample design entails a two-stage probability sample that yields national and sub-national estimates to an acceptable precision at provincial level, by locality type (urban and rural), and by population group (including black, coloured, Indian or Asian and white). The overall response rate among those aged 50 years or older was 60%. The Global Study on Ageing (SAGE) survey was carried out in South Africa in partnership between the World Health Organization (WHO), the National Department of Health, and the Human Sciences Research Council (HSRC). The study was approved by the Human Sciences Research Council Research Ethics Committee and the national Department of Health.

Measures

Arthritis. Participants were asked "Have you ever been diagnosed with/told you have arthritis- a disease of the joints, or by other names rheumatism or osteoarthritis? In addition, symptom-based arthritis was assessed as well as past 12 month and current (past month) treatment for arthritis. Based on cognitive and validation studies (11), "self-reported doctor-diagnosed arthritis is thought to provide the most credible estimate of overall arthritis prevalence, with acceptable sensitivity and specificity for surveillance purposes" (12).

Activity limitation (difficulty an individual may have in executing task or actions) was assessed with one item "Overall in the last 30 days, how much difficulty did you have with work or household activities?" Response options ranged from 1=none to 5=extreme/cannot do. From this we created a dichotomous measure coded 0 if response was 'none' or 'mild' or 'moderate' and 1 if response was 'severe' or 'extreme/cannot do'.

Depression. Symptom-based depression in the past 12 months was assessed based on the World Mental Health Survey version of the Composite International Diagnostic Interview (13). The diagnosis of depression was based on the International Classification of Diseases tenth revision (ICD-10) diagnostic criteria for research for depressive Episodes (14) and was derived from an algorithm that took into account respondents reporting symptoms of depression during the past 12 months (15). In addition, the ones who responded affirmatively to the question, "Have you ever been diagnosed with depression?" were added to the symptom-based depression.

Sleeping quality was assessed with two questions about the quality of sleep in the previous two nights prior to the survey. Sleeping problem was defined as poor or very poor sleep in one or two of the past two nights.

Blood pressure (systolic and diastolic) was measured three times on the right arm/wrist of the seated respondent using an automated recording device (OMRON R6 Wrist Blood Pressure Monitor, HEM-6000-E, Omron Healthcare Europe, B.V., Hoofddorp, and The Netherlands).

Out of three measurements, the average of the last two readings was used. In accordance with the Seventh Report of the Joint National Committee of Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, individuals with systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg and/ or who reported the current use of antihypertensive medication were considered to be suffering from high blood pressure (16).



Tobacco use- Lifetime tobacco used was assessed with the question "Have you ever smoked tobacco or used smokeless tobacco?" Lifetime tobacco users were asked "Do you currently use (smoke, sniff or chew) any tobacco products such as cigarettes, cigars, pipes, chewing tobacco or snuff? The response options were "Yes, daily", "Yes, but not daily" and "No, Not at all". These questions are based on the WHO Guidelines for Controlling and Monitoring the Tobacco Epidemic (17).

Height and weight were measured. Body mass index (BMI) was used as an indicator of obesity (≥ 30 kg/m²). Body mass index (BMI) was calculated as weight in kg divided by height in metre squared.

Physical activity was measured using the General Physical Activity Questionnaire (GPAQ). The instrument gathers information on physical activity in three domains (activity at work, travel to and from places, and recreational activities), as well as time spent on sitting. The questionnaire also assesses vigorous and moderate activities performed at work and for recreational activities. Information on the number of days in a week spent on different activities and time spent in a typical day for each activity was also recorded (18). The number of days and total physical activity metabolic equivalents (METs) minutes per week were used to classify respondents into three categories of low, moderate, and high level of physical activities (18).

Social cohesion- Social cohesion was measured with 9 items, starting with the introduction "How often in the last 12 months have you..." e.g., attended any group, club, society, union or organizational meeting?" Response options ranged from never=1 to daily=5. Cronbach alpha for this social cohesion index in this sample was 0.73.

Quality of life- was assessed with the WHOQol-8 containing eight items that were empirically derived from the WHOQOL-Bref (19). The summative model was used producing an index. Cronbach alpha for the WHOQol-8 was 0.85 in this sample.

Economic or wealth status. To estimate economic or wealth status, a random-effects probit model was used to identify indicator-specific thresholds that represent the point on the wealth scale above which a household is more likely to own a particular asset than not. This enabled an estimation of an asset ladder. These estimates of thresholds, combined with actual assets observed to be owned for any given household, were used to produce an estimate of household-level wealth status. This was used to create wealth quintiles (20).

Chronic conditions. Other chronic conditions such as stroke and diabetes were assessed by self-report.

Data Analysis

The data were entered using CSPRO and analysed using STATA Version 10. Data was weighted using post-stratified individual probability weights based on the selection probability at each stage of selection. Individual weights were post-stratified by province, sex and age-groups according to the 2009 Medium Mid Year population estimates from Statistics South Africa¹. Weights were not normalised. Outliers were removed after examining the data using boxplot analyses. Computed estimates and odds ratios are reported with 95% confidence intervals and a two-side p-value of 0.05 used as the cut-off point for statistical significance. Associations between key outcomes of doctor diagnosed arthritis and sociodemographic, social and health variables were evaluated calculating odds ratios (OR). Unconditional multivariable logistic regression was used for evaluation of the impact of explanatory variables for key outcome of arthritis (binary dependent variable). All variables statistically significant at the $P < .05$ level in bivariate analyses were included in the multivariable models. In the analysis, weighted percentages are reported. The reported sample size refers to the sample that was asked the target question. The two-sided 95% confidence intervals are reported. The P values less or equal to 5% is used to indicate statistical significance. Both the reported 95% confidence intervals and the P value are adjusted for the multi-stage stratified cluster sample design of the study.

RESULTS

Sample Characteristics and Arthritis Prevalence

The total sample included 3840 50 years or older South Africans, 44.1% men and 55.9% women. The most prevalent population group was African Black (74%), almost half (49.9%) was between 50 to 59 years old. The educational level of most participants (71.6%) was lower than secondary school education and almost two-thirds (64.9%) lived in an urban area. A very large proportion of older adults had hypertension (77.3%), 20.4% were daily tobacco users, 5.8% had depression combining self-reported diagnosed depression and symptom reporting, 9.2% had diabetes and 46.7% were obese. In addition, 4.0% had had a stroke, 8.9% a sleeping problem and 10.7% reported severe or extreme activity limitations. More than half (60.5%) engaged in low physical activity and 38.1% rated their quality of life as high. Overall, 24.7% had self-reported diagnosed arthritis, 28.4% symptom-based arthritis; and of those who had self-reported diag-


Table 1— Sample Characteristics and Prevalence of Arthritis Among Older South Africans.

| Variables | Total sample n (%) | SR % | Sx % | CTx % | RTx % |
|---|-----------------------|---------|---------|----------|----------|
| All Age | 3840 | 24.7 | 28.4 | 67.6 | 77.3 |
| 50-59 | 1695 (49.9) | 21.6 | 25.7 | 66.0 | 78.2 |
| 60-69 | 1233 (30.6) | 30.1 | 31.5 | 65.3 | 77.9 |
| 70-79 | 661 (14.0) | 22.8 | 27.6 | 72.6 | 67.7 |
| 80 and over | 251 (5.5) | 28.1 | 37.8 | 83.4 | 86.8 |
| Gender | | | | | |
| Male | 1638 (44.1) | 18.9 | 22.6 | 68.9 | 75.9 |
| Female | 2202 (55.9) | 29.3 | 33.0 | 67.0 | 77.9 |
| Population Group | | | | | |
| African Black | 2053 (74.0) | 21.4 | 27.3 | 68.0 | 76.3 |
| White | 269 (9.3) | 20.2 | 18.7 | 61.9 | 67.7 |
| Coloured | 655 (12.8) | 40.9 | 39.1 | 65.3 | 80.4 |
| Indian or Asian | 307 (3.8) | 42.3 | 43.5 | 65.5 | 69.1 |
| Wealth | | | | | |
| Low | 1482 (40.6) | 21.7 | 27.0 | 70.3 | 82.8 |
| Medium | 731 (18.2) | 23.1 | 30.9 | 67.5 | 80.6 |
| High | 1608 (41.2) | 28.3 | 28.8 | 65.9 | 71.6 |
| Geolocality | | | | | |
| Rural | 1276 (35.1) | 21.7 | 25.9 | 74.1 | 81.9 |
| Urban | 2561 (64.9) | 26.3 | 29.8 | 64.8 | 75.2 |
| Subjective Health Status | | | | | |
| Very good/good | 1469 (37.9) | 13.3 | 13.4 | 57.3 | 73.2 |
| Moderate | 1681 (44.9) | 28.9 | 34.5 | 66.9 | 75.9 |
| Bad/very bad | 617 (17.5) | 39.1 | 47.8 | 76.8 | 82.8 |
| Other Conditions | | | | | |
| Hypertension | 2842 (77.3) | 26.3 | 30.4 | 71.8 | 80.6 |
| Stroke | 139 (4.0) | 50.9 | 48.0 | 75.9 | 89.8 |
| Diabetes | 219 (5.2) | 44.9 | 47.6 | 73.6 | 82.2 |
| Depression | 219 (5.8) | 41.6 | 58.3 | 65.7 | 75.4 |
| Sleeping problem | 308 (8.9) | 40.1 | 48.0 | 71.0 | 77.8 |
| Obesity (BMI >30) | 1539 (46.7) | 32.0 | 34.3 | 68.9 | 80.3 |
| Physical Activity | | | | | |
| Low | 2455 (60.5) | 28.6 | 28.0 | 69.5 | 76.8 |
| Medium | 446 (10.9) | 20.6 | 27.0 | 68.5 | 74.7 |
| High | 939 (28.6) | 18.6 | 29.9 | 61.6 | 79.6 |
| Activity Limitation | | | | | |
| None/mild | 2090 (55.2) | 16.6 | 19.4 | 63.7 | 79.7 |
| Moderate | 1275 (34.2) | 32.5 | 37.6 | 66.8 | 74.9 |
| Severe/extreme | 370 (10.7) | 41.3 | 49.2 | 79.6 | 80.1 |
| Social cohesion index (range 9-72); M (SD) | 22.1 (6.5) | | | | |
| Quality of Life (QoL) (range 0-100); M (SD) | 47.1 (12.5) | | | | |
| Low | 956 (28.5) | 35.0 | 41.4 | 68.8 | 76.8 |
| Medium | 1384 (33.5) | 21.3 | 26.9 | 66.0 | 74.7 |
| High | 1500 (38.1) | 19.7 | 20.0 | 67.6 | 79.6 |

CTx, current therapy (in past 2 weeks); RTx, routine ongoing therapy (past 12 months); SR, self-reported prevalence of a diagnosed condition; Sx, symptom-based prevalence of condition.

**Table 2**— Multivariable Logistic Regression with Arthritis in Older South Africans.

| | UOR (95% CI) | AOR (95% CI) |
|---------------------------------|---------------------|---------------------|
| Gender | | |
| Female | 1.00 | 1.00 |
| Male | 0.56 (0.43-0.74)*** | 0.57 (0.44-0.74)*** |
| Age Group | | |
| 50-59 | 1.00 | — |
| 60-69 | 1.57 (0.96-2.56) | |
| 70-79 | 1.07 (0.63-1.82) | |
| 80 and over | 1.42 (0.76-2.67) | |
| Population Group | | |
| Black African | 1.00 | 1.00 |
| White | 0.93 (0.50-1.71) | 0.98 (0.81-1.98) |
| Coloured | 2.54 (1.51-4.29)*** | 3.38 (2.28-5.01)*** |
| Indian or Asian | 2.69 (1.23-5.88)* | 3.16 (1.42-7.02)** |
| Wealth | | |
| Low | 1.00 | — |
| Medium | 1.09 (0.68-1.73) | |
| High | 1.43 (0.88-2.31) | |
| Geolocality | | |
| Rural | 1.00 | — |
| Urban | 1.29 (0.70-2.38) | |
| Other Conditions | | |
| Hypertension | 1.49 (1.06-2.11)* | 1.02 (0.69-1.50) |
| Stroke | 3.35 (1.65-6.82)*** | 2.19 (1.04-4.60)* |
| Depression | 2.29 (1.41-3.74)*** | 1.79 (1.07-3.00)* |
| Sleeping problem | 2.94 (1.90-4.55)*** | 1.80 (1.20-2.71)** |
| Diabetes | 2.78 (1.79-4.34)*** | 1.79 (1.18-2.71)** |
| Obesity BMI>30 | 2.15 (1.55-2.90)*** | 2.21 (1.62-3.02)*** |
| Subjective Health Status | | |
| Very good/good | 1.00 | 1.00 |
| Moderate | 2.66 (1.75-4.03)*** | 2.66 (1.75-4.03)*** |
| Bad/very bad | 4.20 (2.19-8.04)*** | 4.20 (2.19-8.04)*** |
| Activity Limitation | | |
| None/mild | 1.00 | 1.00 |
| Moderate | 2.42 (1.69-3.45)*** | 1.63 (1.24-2.15)*** |
| Severe/extreme | 3.53 (1.75-7.12)*** | 1.75 (1.13-2.98)** |
| Physical Activity | | |
| Low | 1.00 | 1.00 |
| Moderate | 0.65 (0.47-0.90)** | 0.98 (0.69-1.40) |
| High | 0.57 (0.37-0.87)** | 0.86 (0.65-1.13) |
| Social cohesion index | 0.98 (0.96-0.99)* | 1.00 (0.98-1.02) |
| Quality of Life | | |
| Low | 1.00 | 1.00 |
| Medium | 0.50 (0.35-0.72)*** | 0.56 (0.42-0.75)*** |
| High | 0.45 (0.27-0.76)** | 0.64 (0.41-1.02) |

***P<.001; **P<.01; *P<.05

nosed arthritis 77.3% were undergoing routine ongoing therapy in the past 12 months and 67.6% were under current therapy (in past 2 weeks) for arthritis (see Table 1).

Predictors of Arthritis

In univariate analyses female gender, Coloured, Indian or Asian population group, other illness or chronic conditions (Hypertension, Stroke, Depression, Sleeping problem, Diabetes and Obesity), poorer subjective health status, greater activity limitations, low physical activity, low social cohesion and low quality of life were associated with self-reported arthritis. In multivariable analysis female gender, Coloured, Indian or Asian population group, other illness or chronic conditions (Stroke, Depression, Sleeping problem, Diabetes and Obesity), poorer subjective health status, greater activity limitations and low quality of life were associated with self-reported arthritis (Table 2).

DISCUSSION

The study found in a national sample of older adults in South Africa an overall prevalence of 24.7% self-reported diagnosed arthritis. These rates seem to be higher than previously found in South Africa (4) but similar to other studies in middle and high-income countries (2,3).

Further, the study found, in concordance with other studies (1-3,6-10) that female gender, Coloured, Indian or Asian population group, other illness or chronic conditions (stroke, depression, sleeping problem, diabetes and obesity), poorer subjective health status, greater activity limitations and low quality of life were associated with self-reported arthritis. The association between arthritis and sleep complaints may be related to overnight pain and discomfort. Moreover, the finding that the Coloured, Indian or Asian population group had higher rates of arthritis than the African and White population groups need further investigation.

Unlike in other studies, this study did not find any association between lower income and less wealth (2,3) and prevalence of arthritis.

This study had several limitations. Firstly, the self-report of health variables such as depression symptoms, tobacco or alcohol use should be interpreted with caution; it is possible that measurement errors occurred. Another issue with regard to research on arthritis prevalence is the use of self-report data obtained via questionnaires or interviews. It has been documented that a higher prevalence is found for musculoskeletal diseases from self-reporting than when estimated from physi-



cal examinations (21). Finally, this study was based on data collected in a cross-sectional survey. We cannot, therefore, ascribe causality to any of the associated factors in the study.

In conclusion, high rates of arthritis were found in this older adult population in South Africa. Considering the paucity of similar studies addressing the impact of arthritis in Africa, these findings may be applied to similar communities and support better planning of resource allocations to minimize the effects of arthritis among the elderly. Further study is needed to confirm and elucidate the reasons for racial disparities in older populations.

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