

## Burden of erectile dysfunction and associated chronic medical conditions among adult men in an automobile spare parts market in Ibadan metropolis

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### Abstract

DOI: <https://doi.org/10.64052/v1ad6m77>

**Background:** Erectile dysfunction (ED) is a medical condition affecting psychosocial well-being. It has been linked to different chronic diseases, both of which can reduce Quality of Life (QoL). Individuals in the vehicle spare parts market may lack knowledge and resources for its proper management, based on their socio-economic status. This study aimed to assess the burden of ED and chronic diseases, along with associated factors, in this population.

**Methods:** A cross-sectional study was conducted among 400 men aged 18 to 59 years at a spare parts market in urban Ibadan, using a proportionate stratified sampling method. Data were collected via a pre-tested, interviewer-administered questionnaire and analysed with SPSS version 27. Associations were examined through chi-squared tests and logistic regression at a 5% significance level.

**Results:** The mean age was  $39.54 \pm 13.33$  years; most were married (69.4%) and had secondary education (71%). ED prevalence was 30.5%, with 17.5% experiencing mild and 3% the severe form. Reported chronic diseases had a prevalence of 10.5%. Additionally, 19.7% had elevated blood pressure, 48.2% had abnormal BMI, and 5.2% had deranged blood glucose. Significant associations with ED were found in older age (40-59 years,  $p=0.008$ ), chronic conditions ( $p=0.028$ ), abnormal glucose ( $p=0.006$ ), elevated blood pressure ( $p=0.003$ ) and use of chronic medications ( $p=0.022$ ). However, none were independently associated in multivariable analysis.

**Conclusion:** ED and chronic diseases are prevalent in this population. Although no independent predictors were identified, targeted health education and preventive strategies are recommended.

**Keywords:** Erectile dysfunction, Chronic diseases, Adult, Automobile spare parts market, Ibadan.

### Introduction

Erectile Dysfunction (ED) is a disorder of the arousal phase of sexual response characterised by the persistent inability to achieve or maintain an erection sufficient for satisfactory sexual intercourse.<sup>1</sup> It affects men of all ages, although increasing age has consistently been associated with the condition<sup>2-4</sup>. Recent evidence, however, suggests a rising prevalence among younger men, largely due to earlier development of chronic diseases within this population<sup>5-7</sup>. A hospital-based study conducted in Italy by Rastrelli et al. reported that the proportion of men younger than 40 years presenting with ED increased from 5% in 2010 to over 15% in 2015.<sup>5</sup>

Globally, the prevalence of ED has continued to rise<sup>8</sup>. Ayta et al. reported that by 2025, approximately 322 million men worldwide will be affected, compared with 152 million in 1995 as cited by Mohd Arsath et al.<sup>9</sup> A review of population studies by Michael et al., in 2019, reported prevalence rates ranging from 13.1–71.2% using the International Index of Erectile Function (IIEF) tool, and 15.5–69.2% using the Massachusetts Male Ageing Study (MMAS) self-assessment instrument<sup>10</sup>. In sub-Saharan Africa, a population-based review by Nyalile et al. in 2020 documented the prevalence of ED across several African countries, reporting rates of 65.9% in Ghana and 29.7% in Tanzania, while studies in Egypt reported 10% moderate and 13% severe ED<sup>11</sup>. In Nigeria, community-based studies have reported prevalence rates ranging from 43.8% to 66.4%<sup>12-15</sup>, with even higher rates of 48.4–98% observed among men with non-communicable diseases (NCDs).<sup>7,12-13</sup>

The increasing burden of NCDs such as Hypertension and Diabetes Mellitus has been linked to epidemiological and demographic transitions in both high-income and low- and middle-income countries.<sup>14,16</sup> A review conducted in 2019 reported that more than half (53.8%) of adults aged 18–34 years in the United States had at least one chronic condition, while approximately 22.3% had multiple chronic conditions.<sup>15</sup> In many low- and middle-income countries, the burden of NCDs is increasing due to lifestyle changes associated with westernisation.<sup>17</sup> Furthermore, advances in technology and improvements in life expectancy have also contributed to the rising prevalence of chronic diseases and their complications, including ED. For example, the Global Burden of Diseases, Injuries, and Risk Factors Study reported that disability-adjusted life years attributable to NCDs in sub-Saharan Africa increased by 67% between 1990 and 2017.<sup>14</sup>

Beyond its medical implications, ED has substantial psychosocial and economic consequences. The condition can negatively affect self-esteem, interpersonal relationships, and overall quality of life, and may also impair productivity and economic performance.<sup>18,19</sup> These effects may be particularly pronounced among young and middle-aged men, for whom sexual performance is often culturally associated with masculinity and vitality. For instance, a multinational study conducted by Goldstein et al. in 2019 reported that men with ED experienced significantly higher rates of absenteeism and reduced work productivity compared with men without ED.<sup>20</sup>

The automobile spare-parts markets represent densely populated

occupational environments largely dominated by young men who are often exposed to stressful and unfavourable working conditions. Such conditions may promote unhealthy lifestyle behaviours, including excessive alcohol consumption, substance use, and poor dietary habits. These behaviours increase the risk of NCDs such as hypertension, diabetes mellitus, and dyslipidaemia, which may subsequently lead to ED as a complication.<sup>3,6</sup> This study therefore aimed to determine the prevalence of ED and its association with chronic diseases and lifestyle factors among men in an urban setting in Ibadan. The findings will provide evidence to guide targeted interventions aimed at preventing or delaying ED and other chronic diseases among men working in the Araromi spare-parts market in Ibadan.

### Ethical Consideration

Ethical approval for the study was obtained from the Health Research and Ethics Committee of the Oyo State Ministry of Health, Ibadan (NHREC/OYOSHRIEC/10/11/22). Permission was also obtained from the general president and sectional leaders of the Araromi spare-parts market. Written informed consent was obtained from each participant before data collection.

### Methods

#### Study design and setting

This cross-sectional study was conducted at the Araromi vehicle spare-parts market located at Agodi Gate in Ibadan North-East Local Government Area of Oyo State, Nigeria. Oyo State had an estimated population of about 7,976,100 in 2022, projected from the 2006 national population census assuming an annual growth rate of 2.3%.<sup>21</sup> Ibadan North-East Local Government Area is one of the urban local government areas within the Ibadan metropolis and had an estimated population of about 473,700 inhabitants in 2022.<sup>21</sup>

#### Data Collection

The sampling frame consisted of approximately 12,000 men distributed across eight sections of the market. A proportionate stratified sampling technique was used to recruit 50 consenting sexually active men aged 18–59 years from each section, resulting in a total sample size of 400 participants.

Participants were assessed for ED and chronic medical conditions. Clinical parameters measured included blood pressure, random blood glucose (RBG), and body mass index (BMI). The minimum sample size of 384 was calculated using the Leslie Kish formula for prevalence studies based on a prevalence of 48.9% of sexual dysfunction obtained from a hospital-based study among male patients attending a general outpatient clinic in Nigeria.<sup>22</sup>

Data were collected using a pre-tested semi-structured interviewer-administered questionnaire by trained research assistants. Interviews were conducted in private areas within each section of the market to ensure confidentiality. Participants signed written informed consent forms prior to participation and were identified using serial numbers.

The questionnaire included sections on socio-demographic characteristics, chronic medical conditions, lifestyle risk factors, prevalence of ED, and clinical profile. Lifestyle factors assessed included alcohol consumption, substance use, physical activity, and cigarette smoking. Alcohol consumption was assessed using the Alcohol Use Disorders Identification Test (AUDIT) developed by the World Health Organisation.<sup>23</sup> Physical activity was assessed

using the International Physical Activity Questionnaire (IPAQ) short form.<sup>24</sup>

Erectile function was assessed using the International Index of Erectile Function (IIEF), a validated 15-item instrument.<sup>25</sup> BMI was calculated as weight divided by height squared and classified according to World Health Organisation criteria.<sup>26</sup> Elevated screened blood pressure was defined as blood pressure  $\geq 140/90$  mmHg at the study assessment<sup>27</sup>, while RBG  $\geq 200$  mg/dl indicated diabetes and values between 140–199 mg/dl indicated pre-diabetes<sup>28</sup>

### Data Analysis

Data were analysed using IBM SPSS Statistics version 27. Descriptive statistics included means and standard deviations as summarised continuous variables, while categorical variables were presented as frequencies and percentages. Associations between variables were tested using chi-square and Fisher's exact tests with a significance level of  $p < 0.05$ . A binary logistic regression analysis was conducted to identify factors that are independently associated with ED. All variables with  $p < 0.20$  in the bivariate analysis were considered for inclusion in the multivariate analysis model to minimise the risk of excluding potentially important predictors or confounders that may become significant after adjustment. These variables were also factors that were clinically and theoretically important in ED.

All respondents received health education on sexual dysfunction and chronic diseases. Participants identified with ED, abnormal blood pressure, or abnormal blood glucose levels were referred to appropriate health facilities for further evaluation.

## RESULTS

**Table I. Socio-Demographic Characteristics of Respondents (N=400)**

| Variables                  | Frequency(N=400) | Percentage (%) |
|----------------------------|------------------|----------------|
| <b>Age Group(years)</b>    |                  |                |
| < 25                       | 93               | 23.3           |
| 25 - 39                    | 93               | 23.3           |
| 40 - 59                    | 214              | 53.4           |
| <b>Marital Status</b>      |                  |                |
| Single                     | 98               | 24.5           |
| Married                    | 278              | 69.4           |
| Cohabiting                 | 10               | 2.5            |
| Divorced/separated/widowed | 14               | 3.6            |
| <b>Educational level</b>   |                  |                |
| No formal Education        | 15               | 3.8            |
| Primary                    | 84               | 21.0           |
| Secondary                  | 284              | 71.0           |
| Post-secondary             | 17               | 4.2            |
| <b>Income</b>              |                  |                |
| $\leq$ N30,000             | 104              | 26.0           |
| $>$ N30,000                | 296              | 74.0           |
| <b>Religion</b>            |                  |                |
| Christianity               | 51               | 12.8           |
| Islam                      | 349              | 87.2           |

|                         |     |      |
|-------------------------|-----|------|
| <b>Ethnicity</b>        |     |      |
| Hausa                   | 2   | 0.5  |
| Ibo                     | 3   | 0.88 |
| Yoruba                  | 395 | 98.7 |
| <b>Occupation</b>       |     |      |
| Apprentice              | 135 | 33.8 |
| Dealer                  | 265 | 66.2 |
| <b>Health insurance</b> |     |      |
| Yes                     | 5   | 1.3  |
| No                      | 395 | 98.7 |

**Table II: Pre-existing and undiagnosed chronic medical conditions among respondents**

| Variables                                | Frequency | Percentage(%) |
|------------------------------------------|-----------|---------------|
| <b>Chronic medical conditions</b>        |           |               |
| Yes                                      | 42        | 10.5          |
| No                                       | 358       | 89.5          |
| <b>Known medical conditions (n = 42)</b> |           |               |
| Hypertension                             | 34        | 81.0          |
| Diabetes                                 | 3         | 7.1           |
| *Others                                  | 5         | 11.9          |
| <b>Medication history (n=42)</b>         |           |               |
| Yes                                      | 36        | 85.7          |
| No                                       | 6         | 14.3          |
| <b>BMI</b>                               |           |               |
| Underweight                              | 14        | 3.5           |
| Normal                                   | 207       | 51.8          |
| Overweight                               | 127       | 31.7          |
| Obesity                                  | 52        | 13.0          |
| <b>Screened Blood Pressure</b>           |           |               |
| Elevated                                 | 79        | 19.7          |
| Not elevated                             | 321       | 80.3          |
| <b>Random Blood Glucose</b>              |           |               |
| Normal                                   | 379       | 94.8          |
| Pre-diabetes                             | 16        | 4.0           |
| Diabetes                                 | 5         | 1.2           |

\*Others (arthritis, glaucoma & hepatitis B)

Few respondents, 42 (10.5%), reported a history of known medical conditions and hypertension 34 (81.0%) was the most common. Of the 42 respondents being managed for chronic conditions, 36 (85.7%) were on medications. About half, 193 (48.2%) of the respondents had abnormal BMI (underweight, overweight and obesity). Abnormal blood glucose (prediabetes and diabetes range) and elevated screened blood pressure were identified in 21 (5.2%) and 79 (19.7%) of the respondents, respectively.

**Table III: Lifestyle factors among respondents (N=400)**

| Variables                     | Frequency | Percentage (%) |
|-------------------------------|-----------|----------------|
| <b>Ever smoked cigarette</b>  |           |                |
| Yes                           | 77        | 19.2           |
| No                            | 323       | 80.8           |
| <b>Current cigarettes use</b> |           |                |
| Yes                           | 43        | 10.8           |
| No                            | 357       | 89.2           |

### Alcohol Consumption

|     |     |      |
|-----|-----|------|
| Yes | 139 | 34.7 |
| No  | 261 | 65.3 |

### Psychoactive substance use

|     |     |      |
|-----|-----|------|
| Yes | 72  | 18.0 |
| No  | 328 | 82.0 |

### Physical activity levels

|          |     |      |
|----------|-----|------|
| Low      | 76  | 19.0 |
| Moderate | 281 | 70.2 |
| High     | 43  | 10.8 |

History of smoking cigarettes and current smoking were 77 (19.2%) and 43 (10.8%), respectively. A smaller proportion, 72 (18%), took psychoactive substances, and 139 (34.7%) were drinking alcohol. Most, 281 (70.2%) of the respondents had moderate levels of physical activity.

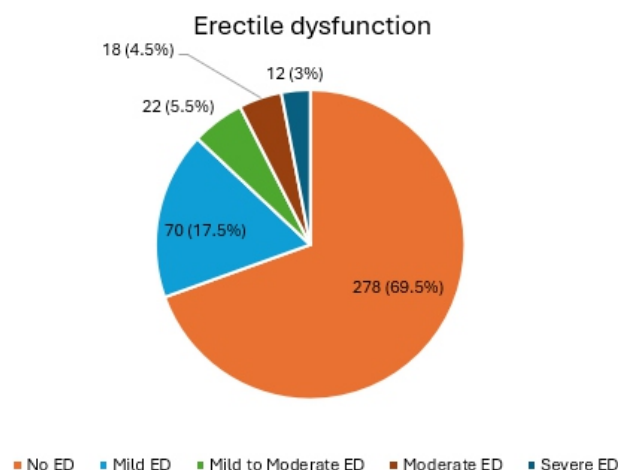


**Figure 1. Prevalence of Erectile function among respondents (N=400)**

A greater proportion, 278 (69.5%), of the respondents had no erectile dysfunction; 70 (17.5%) had mild ED; 22 (5.5%) had mild to moderate ED; 18 (4.5%) had moderate and 12 (3.0%) had severe ED.

**Table IV: Socio-demographic factors associated with erectile dysfunction among respondents**

| Variables                 | Erectile dysfunction |            | $\chi^2$           | df | p-value |
|---------------------------|----------------------|------------|--------------------|----|---------|
|                           | Present              | Absent     |                    |    |         |
| <b>Age Group (years)</b>  |                      |            | 9.571              | 2  | 0.008*  |
| <25                       | 24 (25.8)            | 69 (74.2)  |                    |    |         |
| 25-39                     | 19 (20.4)            | 74 (79.6)  |                    |    |         |
| 40-59                     | 79 (36.9)            | 135 (63.1) |                    |    |         |
| <b>Marital Status</b>     |                      |            | 0.272              | 1  | 0.602   |
| Currently Married         | 87 (31.3)            | 191(68.7)  |                    |    |         |
| Not Currently Married     | 35 (28.7)            | 87 (71.3)  |                    |    |         |
| <b>Educational levels</b> |                      |            | 1.687 <sup>f</sup> | 2  | 0.430   |
| No Formal                 | 6 (40.0)             | 9 (60.0)   |                    |    |         |
| Primary/Secondary         | 109 (29.6)           | 259 (70.4) |                    |    |         |
| Post-secondary            | 7 (41.2)             | 10 (58.8)  |                    |    |         |
| <b>Income</b>             |                      |            | 0.005              | 1  | 0.945   |
| ≤ N30,000                 | 32(30.8)             | 72 (69.2)  |                    |    |         |
| > N30,000                 | 90 (30.4)            | 206 (69.6) |                    |    |         |
| <b>Religion</b>           |                      |            | 0.256              | 1  | 0.613   |
| Christianity              | 14 (27.5)            | 37 (72.5)  |                    |    |         |
| Islam                     | 108 (30.9)           | 241 (69.1) |                    |    |         |

|                         |            |            |                    |   |       |
|-------------------------|------------|------------|--------------------|---|-------|
| <b>Ethnicity</b>        |            |            | 0.216 <sup>f</sup> | 1 | 0.642 |
| Yoruba                  | 120 (30.4) | 275 (69.6) |                    |   |       |
| *Others                 | 2 (40.0)   | 3 (60.0)   |                    |   |       |
| <b>Occupation</b>       |            |            | 2.011              | 1 | 0.156 |
| Dealer                  | 87 (32.8)  | 178 (67.2) |                    |   |       |
| Apprentice              | 35 (25.9)  | 100 (74.1) |                    |   |       |
| <b>Health Insurance</b> |            |            | 2.222 <sup>f</sup> | 1 | 0.136 |
| Yes                     | 0(0.00)    | 5 (100.0)  |                    |   |       |
| No                      | 122 (30.9) | 273 (69.1) |                    |   |       |

\* Significant at  $p < 0.05$ ,  $f$  = Fisher Exact test \* Others-Hausa and Ibo  
Seventy-nine (36.9%) respondents within the age group 40–59 years had erectile dysfunction. This was statistically significant at  $p = 0.008$ . Erectile dysfunction was present in almost equal proportions across the income categories, religion, and marital status, and these were not statistically significant

**Table V: Association between pre-existing and undiagnosed medical conditions and erectile dysfunction among respondents**

| Variables                             | Erectile dysfunction |            | $\chi^2$           | df | p-value |
|---------------------------------------|----------------------|------------|--------------------|----|---------|
|                                       | Present              | Absent     |                    |    |         |
| <b>Known medical conditions</b>       |                      |            | 4.809              | 1  | 0.028*  |
| Yes                                   | 19 (45.2)            | 23 (54.8)  |                    |    |         |
| No                                    | 103 (28.8)           | 255 (71.2) |                    |    |         |
| <b>Undiagnosed medical conditions</b> |                      |            |                    |    |         |
| <b>Screened blood pressure:</b>       |                      |            | 8.849              | 1  | 0.003*  |
| Elevated                              | 35 (44.3)            | 44 (55.7)  |                    |    |         |
| Not elevated                          | 87 (27.1)            | 234 (72.9) |                    |    |         |
| <b>RBG:</b>                           |                      |            | 7.422 <sup>f</sup> | 1  | 0.006*  |
| Normal                                | 110 (29.0)           | 269 (71.0) |                    |    |         |
| Abnormal                              | 12 (57.1)            | 9 (42.9)   |                    |    |         |
| <b>BMI:</b>                           |                      |            | 0.808              | 1  | 0.369   |
| Normal                                | 59 (28.5)            | 148 (71.5) |                    |    |         |
| Abnormal                              | 63 (32.6)            | 130 (67.4) |                    |    |         |
| <b>Medication history</b>             |                      |            | 5.219              | 1  | 0.022*  |
| Yes                                   | 17 (47.2)            | 19 (52.8)  |                    |    |         |
| No                                    | 105 (28.8)           | 259(71.2)  |                    |    |         |

\* Significant at  $p < 0.05$ ,  $f$  = Fisher Exact test

More, 19 (45.2%) and 17 (47.2%) of those who had pre-existing medical conditions and were on medications had erectile dysfunction compared to those who did not or were not taking medications, at  $p = 0.028$  and  $p = 0.022$ , respectively.

Greater proportions, 35 (44.3%) and 12 (57.1%) of those who had elevated B/P and abnormal RBG had ED at a significant value of  $p = 0.003$  and  $p = 0.006$ , respectively. There was no significant association between abnormal BMI and the presence of ED.

**Table VI. Lifestyle factors associated with erectile dysfunction among respondents**

| Variables                    | Erectile dysfunction |            | $\chi^2$ | df | p-value |
|------------------------------|----------------------|------------|----------|----|---------|
|                              | Present              | Absent     |          |    |         |
| <b>Ever smoked cigarette</b> |                      |            | 1.526    | 1  | 0.217   |
| Yes                          | 19 (24.7)            | 58 (75.3)  |          |    |         |
| No                           | 103 (31.9)           | 220(68.1)  |          |    |         |
| <b>Current Smoker</b>        |                      |            | 1.639    | 1  | 0.200   |
| Yes                          | 10 (22.2)            | 35 (77.8)  |          |    |         |
| No                           | 112 (31.5)           | 243 (68.5) |          |    |         |
| <b>Alcohol Consumption</b>   |                      |            | 1.514    | 1  | 0.219   |
| Yes                          | 37 (26.6)            | 102 (73.4) |          |    |         |
| No                           | 85 (32.6)            | 176 (67.4) |          |    |         |

|                                   |            |            |       |   |       |
|-----------------------------------|------------|------------|-------|---|-------|
| <b>Psychoactive Substance use</b> |            |            | 0.700 | 1 | 0.403 |
| Yes                               | 19 (26.4)  | 53 (73.6)  |       |   |       |
| No                                | 103 (31.4) | 225 (68.6) |       |   |       |
| <b>Physical activity</b>          |            |            | 0.437 | 1 | 0.509 |
| Low/Moderate                      | 107 (30.0) | 250 (70.0) |       |   |       |
| High                              | 15 (34.9)  | 28 (65.1)  |       |   |       |

\* Significant at  $p < 0.05$ ,  $f$  = Fisher's exact test

There were no significant associations between the various lifestyle factors and Erectile dysfunction.

**Table VII. Logistic Regression of Factors Associated with Erectile Dysfunction amongst respondents (N=400)**

| Variables                       | AOR   | p-value | 95% C.I for OR |       |
|---------------------------------|-------|---------|----------------|-------|
|                                 |       |         | LCI            | UCI   |
| <b>Age</b>                      |       |         |                |       |
| < 25 (ref)                      | 1     |         |                |       |
| 25-39                           | 0.842 | 0.650   | 0.400          | 1.711 |
| 40-59                           | 0.599 | 0.117   | 0.315          | 1.136 |
| <b>Occupation</b>               |       |         |                |       |
| Dealers (ref)                   | 1     |         |                |       |
| Others                          | 1.047 | 0.881   | 0.569          | 1.927 |
| <b>Current Smoker</b>           |       |         |                |       |
| Yes (ref)                       | 1     |         |                |       |
| No                              | 0.720 | 0.405   | 0.333          | 1.559 |
| <b>Known Medical Conditions</b> |       |         |                |       |
| Yes (ref)                       | 1     |         |                |       |
| No                              | 0.979 | 0.981   | 0.168          | 5.702 |
| <b>Medication History</b>       |       |         |                |       |
| Yes (ref)                       | 1     |         |                |       |
| No                              | 1.365 | 0.743   | 0.213          | 8.774 |
| <b>Screened B/P</b>             |       |         |                |       |
| Elevated (ref)                  | 1     |         |                |       |
| Not Elevated                    | 0.630 | 0.116   | 0.354          | 1.121 |
| <b>RBG</b>                      |       |         |                |       |
| Abnormal (ref)                  | 1     |         |                |       |
| Normal                          | 0.448 | 0.094   | 0.175          | 1.147 |
| <b>Constant</b>                 | 1.511 | 0.474   |                |       |

No variables were independently associated with ED in the binary logistic regression

## Discussion

This study determined the prevalence of ED and chronic diseases, as well as the relationship between reported and undiagnosed chronic medical conditions and ED among male adults in Nigeria. About one-third of the respondents in this study have erectile dysfunction, which is consistent with studies done in Northcentral Nigeria and Poland<sup>29-30</sup>. This prevalence is, however, lower compared to rates of between 43.8% and 58.9% obtained in other population studies in different geopolitical zones of Nigeria and HICs like Italy, Spain, the USA, etc.<sup>20-31-34</sup>. The difference seen in these studies with higher rates may be because the studies included older men, aged 60years and above. However, lower prevalence rates of 24% and 25.4% of erectile dysfunction using similar tools were found in studies done in Tanzania and Ethiopia.<sup>35-36</sup> The difference could be because of the smaller population size in this current study.

Mild erectile dysfunction was the most common in this study, and this is in agreement with many other population-based studies

globally.<sup>11-34-37-38</sup> The few studies reporting a high rate of severe erectile dysfunction comparable to mild were done in patients with comorbidities<sup>34-39</sup>, which may explain the disparity. Erectile dysfunction was significantly associated with increasing age on the bivariate analysis, as more participants aged 40-59 years had ED. This significant association was, however, eroded on multivariate analysis in this study. This finding is consistent with what most studies have reported: that erectile dysfunction is associated with increasing age<sup>4-12-29-36-40-41</sup>

One-tenth of the participants reported a history of chronic diseases in this study, the majority of which was hypertension. This finding was consistent with what was reported in a community survey in South Africa, where it was reported that 16.3% of South Africans aged 18 years and above had a single or multiple chronic diseases of lifestyle, and hypertension was the most common.<sup>42</sup> In a population-based study in Nigeria, a higher prevalence of chronic diseases of 51.5% was reported by Faronbi et al. in 2021.<sup>43</sup> The disparity could be attributed to the older population surveyed in the later study compared to this current study. Other studies in the United States of America and Denmark reported a higher prevalence of 53.8% and 65.6%, respectively<sup>15-44</sup>, and this could be because the studies were done in a larger population and in the Western world with high consumption of unhealthy diets.

The presence of chronic diseases was significantly associated with ED on bivariate analyses in this study. Such findings are in tandem with what was reported by Pallangyo et al. in 2016 in Tanzania, as chronic diseases proved to be a significant predictor on bivariate analysis but lost its significance after multivariate analysis.<sup>35</sup> However, Li et al., 2021 in a prospective real-world study of the United Kingdom population, reported that men with ED had  $\geq 1$  comorbid chronic condition (73.7% vs. 47.7%) compared to the control.<sup>45</sup> A plausible reason for this difference could be the larger population in the later study.

This present study further identified screened elevated blood pressure in about one-fifth of the participants. The reason for this high prevalence of elevated blood pressure could be because more than half of the participants are aged between 40 to 59 years. This age period is associated with loss of elasticity of the vessels with attendant development of NCDs such as hypertension. Elevated blood pressure was significantly associated with ED in the bivariate analysis, and this is similar to findings in other studies done in Nigeria<sup>29-32-34-45</sup>, African countries<sup>11-35</sup>, and HICs.<sup>45</sup> Elevated blood pressure was used instead of hypertension because the participants had no prior diagnosis of hypertension before data collection. According to the JNC guideline, for the diagnosis of hypertension to be made, elevation in blood pressure must have been recorded on 2 or more occasions in a subject, except if the one-time reading showed severely elevated blood pressure. The plausible reason for this finding is that persistent elevated blood pressure and hypertension are important non-modifiable risk factors in the aetiology of erectile dysfunction<sup>7-8-46</sup>. However, in multivariable analysis, screened elevated blood pressure and known history of hypertension were not independently associated with ED.

In this study, being on medications for chronic medical conditions was significantly associated with ED in bivariate analysis. Being on antihypertensive medication could be a plausible explanation for

this association, as more than 80% of chronic diseases reported in this study were hypertension. However, this study cannot infer this causation, as the type of medication used and the drug level data were not analysed in this study. Although, being on blood pressure-lowering drugs was not independently associated with ED after adjusting for confounders in this study, research has however documented a significant association between use of antihypertensive drugs and development of ED<sup>32-39</sup>

Prediabetes and diabetes mellitus were significantly associated with ED in the bivariate analysis but were not independently significantly associated with ED in the multivariate analysis. The reason for this could be because of the low prevalence (5.2%) of abnormal blood glucose found in this current study. This finding is consistent with what was reported by Agaba et al. in Jos, Nigeria, in 2018.<sup>37</sup> However, many studies globally have documented that diabetes mellitus is a strong predictor of ED<sup>29-31-32-34-39-45</sup> and this is through both macrovascular and microvascular mechanisms.

The strengths of this study include the assessment of previously undiagnosed chronic medical conditions and the use of an internationally validated tool for assessing ED, which facilitates comparison with other studies. A limitation of this study is the possibility of social desirability bias during the assessment of ED, as ED is a sensitive condition associated with social stigma. However, this challenge was mitigated by ensuring that the confidentiality, autonomy and privacy of the participants were maintained at every point during the data collection. In addition, the cross-sectional design and single occupational setting limit generalisability. Furthermore, the use of RBG in asymptomatic participants has its limitations in making a diagnosis of diabetes mellitus.

## Conclusion

The burden of ED was high in the population sampled, and ED was more frequent in the older age group. Pre-existing medical conditions, screened abnormalities such as elevated blood pressure and abnormal random blood glucose, and alcohol consumption were also present among adult men in the Araromi automobile spare-parts market. Although age, chronic medical conditions, medication use, elevated screened blood pressure and abnormal random blood glucose showed significant bivariate associations with ED, none was independently associated with ED in the multivariable analysis. Further research is needed to clarify factors independently associated with ED in this population. Strategic interventions, including regular health education on erectile dysfunction, promotion of therapeutic lifestyle changes and periodic medical outreaches for screening of chronic diseases, should be considered.

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