Sociodemographic Determinants, Health Conditions, and Mental Status as Predictors of the Functional Status of Older Saudi People

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Abstract: The increasing population of Saudi elderly demands adequate assessment of their functional health status and mental status to improve their health and quality of life. This study aimed to determine the functional status of older Saudi people in performing basic activities of daily living (ADLs) and instrumental activities of daily living (IADLs) and its influencing factors. This quantitative, descriptive-correlational study surveyed a total of 203 participants using the Mini-Mental State Examination, Katz Index of ADL, and Lawton IADL. Overall, the participants had moderate cognitive impairment and were able to perform basic ADLs and IADLs independently, but they needed assistance in doing housework. Functional status was sensitive to their sociodemographic characteristics, presence of health problems, and mental status. Mental status, education, employment, marital status, and source of support were significantly associated with their ability to perform basic ADLs and IADLs. This study suggests that more efforts are needed to understand the sociodemographic characteristics, presence of health problems, and mental status that support the development of evidence-based public health policy on the functional status among older Saudi people. The findings can be utilized by hospital and nursing administrators to initiate educational and training programs for healthcare professionals including nurses and to create healthcare policies so that the health concerns and functional difficulties of older patients are adequately addressed.

Keywords: activities of daily living; functional status; health condition; mental status; older people; Saudi Arabia; sociodemographic determinant

1. Introduction

Approximately 110 to 190 million older people experience difficulties in performing basic functions around the world, and this increasing rate of disability has been associated with the increasing incidence of chronic illnesses [1], including cancer [2,3], diabetes mellitus (DM) [4], and cardiovascular diseases such as heart failure [5], myocardial infarction and hypertension [4,6]. According to the World Health Organization (WHO) [7], the number of individuals aged 60 or more will increase from 900 million in 2015 to 2 billion in 2050. In Saudi Arabia, national reports showed that the older Saudi people aged 65 years old or above increased from 2.86% in 2011 to 3.2% in 2020 of the total population, and with associated increase in life expectancy at birth from 73.8 to 75 years [8].

The gerontological data have been receiving wide interest in global scientific inquiries, which increases the demand for baseline data. This increased demand is also observed for Arab adults including older Saudi people, wherein the aging population will reach its peak in 2050 [7,9–11]. Despite the imminent consequences of the rising population of older people in the Arab region, gerontological studies in these countries are still limited [9], particularly...
in Saudi Arabia where the latest elderly survey (i.e., sociodemographic characteristics, needed services, role in voluntary work and communication with homes for older people) was conducted in 2017 [12].

2. Literature Review

The United Nations does not have a standard numerical criterion to label the older population; however, those aged 60 years and above can be referred to as the older population [1]. Following the demographic indicators of Saudi Arabia, those aged 65 years old and above comprise a population group [8]. Hence, for this study, this population group is considered as older people.

Various studies in Europe and the United States have indicated that as the chronological age of older people advances, the functional deterioration or increasing dependence on basic activities of daily living (ADLs) and instrumental activities of daily living (IADLs) becomes evident [12–14]. Among older people, impaired mobility and functional decline are associated with negative effects on independence, decreased quality of life, and high risk of mortality, as reported in previous studies conducted in Belgium [15], Brazil [16], France [17], and Norway [18]. Moreover, a recent study in Spain reported that functional impairment of older people is associated with increased mortality rates [19].

Previous studies explored the functional well-being of older Saudi people. Among those studies, a descriptive report by Asiri et al. [5] showed that older people with heart failure who received rehabilitation services at home made improvements in their gait performance and ADL function. However, the greater ADL improvements are reported to be correlated with older people having younger age, faster gait performance, and greater impairment ADL scores at baseline. Al Senany and Al Saif [20] explored the physical health status and quality of life among older Saudi people and revealed a significant positive correlation between demographic factors including age and ADLs, memory problems, anxiety, sleep disturbance, and falls. The study of Alhusain et al. [4] among older Saudi people showed that the prevalence of common non-communicable diseases such as obesity is linked with complications and diseases causing physical health concerns and functional status. Collectively, as age advances among older Saudi people, health conditions are likely to be experienced, and increased dependence in performing their basic ADLs and IADLs becomes evident.

Thus, evaluating the functional ability and mental status of older people requires specialized assessment methods. In Saudi Arabia, limited studies have evaluated the health attributes among its older citizens. The scarcity of current studies on older Saudi people’s functional abilities had motivated this study. To optimize healthcare for older Saudi adults, more knowledge is needed to understand the association between sociodemographic characteristics, presence of health problems, mental status, and functional ability to perform basic ADLs and IADLs. Hence, this study aimed to determine the functional status among older people in performing their basic ADLs and IADLs and the factors predictive of this.

Research Questions

- What is the functional status of older Saudi people in performing basic ADLs and IADLs?
- What are the influencing factors of older Saudi people’s functional status in performing basic ADLs and IADLs?

3. Materials and Methods

3.1. Study Design and Setting and Participants

This quantitative study employed a cross-sectional design and adhered to the Strengthening the Reporting of Observational Studies in Epidemiology guidelines. This study was conducted in the Family Medicine Department at King Saud University Medical City in Riyadh, Saudi Arabia. The Medical City has a 1351-bed capacity. A total convenience sample of 203 participants was recruited and voluntarily participated in the study. The
inclusion criteria included: Saudi citizens ≥ 65 years old and willing to participate in the study. The sample size was determined through a priori method using G*Power version 3.1.7 software [21], with a computed sample size of 200. This sample size was sufficient to yield a large effect size (0.8), with an error probability of $\alpha = 0.05$ and a statistical power of 0.95.

3.2. Instrument

The study survey was comprised of four main parts. The first part included participants’ sociodemographic profile, such as gender, age, marital status, employment status, source of support, highest education attained and residence as well as presence of health-related conditions and chronic disease. The second part included participants’ mental status profile, particularly their cognitive function that was measured using the Mini-Mental Status Examination (MMSE) [22]. This measure has been used extensively in testing cognitive function. The concurrent validity of the original MMSE was established by correlating MMSE scores with verbal IQ (Pearson $r = 0.77; p < 0.0001$) and performance IQ (Pearson $r = 0.66; p < 0.001$). Reliability was established by test–retest correlation at 24 h apart (Pearson $r = 0.887$) and 28 days apart (Pearson $r = 0.98$). For mental status, the sum of the scores of each participant was calculated, and the overall mean score was derived and interpreted as follows: no impairment (23–30), mild impairment (21–22), moderate impairment (10–20), and severe impairment (9 or less) [22].

The third and fourth parts measured participants’ functional status by using the Katz Index of ADL [23] and Lawton IADL scale [24], respectively. The performance in basic ADLs was measured using the Katz Index of ADL [23]. This study tool measured the ability of older Saudi people in performing activities, such as bathing, dressing, toileting, transfer, continence, and feeding. Scoring was determined using three criteria: independent (coded as 3), needs assistance (coded as 2), and dependent (coded as 1). Scores per item were aggregated to obtain the level of function of the specific task. The individual aggregated scores per task were averaged to calculate the overall basic ADL level of function. Scores were interpreted using a mean–range model: dependent (1.00–1.66), needs assistance (1.67–2.33), and independent (2.34–3.00) [21]. The tool was chosen on the basis of its extensive use in assessing the function of older persons and in research [21]. It exhibited a reliability coefficient ranging from 0.87 to 0.94 and a concurrent validity of Pearson $r = 0.95$ [25]. The performance of IADLs was measured using the Lawton IADL scale that evaluates the patient’s ability to perform more complex activities that are necessary for optimal independent functioning. This study tool measured the functional capacities of older Saudi people that involved activities, such as using the telephone, traveling, shopping, preparing meals, doing housework, taking medicine and managing money. Scoring and interpretation of scores were the same as that of the basic ADL scale described previously. Reliability was established using the Guttman scale with Pearson $r$ between 0.87 and 0.91 and found to be significant at $p < 0.01$. Validity was also established using Pearson correlation and found to be significant at the $p < 0.01$ level [24].

3.3. Ethical Consideration and Data Collection Procedure

Ethical approval to conduct the study was obtained from the Institutional Review Board (IRB) at the College of Medicine at King Saud University, and administrative approval was obtained from the Head of the Family Medicine Department at King Saud University Medical City. The objectives of the study, procedures, anonymity, and confidentiality were explained in Arabic to the participants. Informed consent was obtained from the participants, and their participation was voluntary. The privacy of participants was maintained by ensuring the anonymity of their responses.

After the IRB and the Family Medicine Department Head approval were obtained, the researchers started gathering data from patients seeking consultation in the department. A single room inside the department’s clinic was allocated for the researchers to distribute the survey to patients while waiting for their initial or follow-up check-up with the consul-
tants. During this time, the researchers discussed the study’s details and the rights of the participants and requested that the participants who agreed to participate in the study sign the informed consent.

Subsequently, the researchers handed out the questionnaire inside a white blank envelope to the participants. The participants’ sociodemographic characteristics were collected using questions about their gender, age, marital status, employment status, source of support, highest education attained and residence as well as presence of health-related conditions and chronic disease. Their mental status referring to the assessment of cognitive impairment was measured using the original MMSE scale. The participants were asked questions or provided directions to assess their orientation (maximum score of 10), immediate recall (maximum score of 3), attention and calculation (maximum score of 5), recall (maximum score of 3), and language (maximum score of 9), with a total score of 30. For their basic ADLs, the participants were asked to measure their ability in performing activities, such as bathing, dressing, toileting, transferring, continence, and feeding by using the three scoring criteria: independent (3), needs assistance (2), and dependent (1). For their IADLs, the participants were asked to measure their ability in performing functional capacities that involved activities such as using the telephone, traveling, shopping, preparing meals, doing housework, taking medicine, and managing money using similar scoring criteria with basic ADLs. The survey lasted for 20 to 30 min. Data were collected for approximately 3 months between March 2019 and May 2019.

3.4. Statistical Analysis

The participants’ sociodemographic characteristics, presence of health-related conditions including chronic disease, and mental status were analyzed, interpreted and presented using frequency, percentage, mean and standard deviation. The results of basic ADLs and IADLs were analyzed using the mean–range interpretation model. Multiple regression analyses were performed to determine the influence of sociodemographic characteristics, presence of health conditions, and mental status on the functional status (i.e., basic ADLs and IADLs) of participants. The findings were inferred when the resulting p-value was <0.05. The IBM SPSS Statistics for Windows v.23 software (IBM Corp., Armonk, NY, USA) was used in data processing and analysis.

4. Results

4.1. Characteristics, Health Conditions, Chronic Disease and Mental Status of Participants

Out of the 230 older Saudi people approached by the researchers, 203 had voluntarily participated in the study, indicating a response rate of 88%. Table 1 shows the participants’ sociodemographic characteristics, presence of health-related conditions and chronic disease, and mental status for cognitive function. The majority of the participants were female (52.71%), with an age range between 65 and 75+ years (71.92%; mean = 72.36; SD = 5.21). Most of them were married (70.94%), unemployed (81.28%), supported by their family (62.07%), had elementary education (93.60%) and resided with their family (97.04%). Most participants (97.54%) had concurrent health-related conditions which were commonly reported among female Saudis. More than half of them had a cardiovascular health condition (51.72%), which was more common among male Saudis and Type 2 diabetes mellitus (62.07%), which was more prevalent among female Saudis. The MMSE scores of participants revealed that they had moderate cognitive impairment (mean = 19.09; SD = 6.09).
Table 1. Characteristics, Health Conditions, Chronic Disease and Mental Status of Participants (n = 203).

| Sociodemographic Characteristics | f   | %   | Male f(%) | Female f(%) |
|----------------------------------|-----|-----|-----------|-------------|
| Gender                           |     |     |           |             |
| Male                             | 96  | 47.29| 65 (32.02)| 81 (39.90)  |
| Female                           | 107 | 52.71|           |             |
| Age (In years)                   |     |     |           |             |
| 65–74                            | 146 | 71.92| 65 (32.02)| 81 (39.90)  |
| (Mean = 72.36; SD = 5.21)        |     |     | 75+       |             |
| 75+                              | 57  | 28.08| 21 (10.34)| 36 (17.73)  |
| Marital Status                   |     |     |           |             |
| Married                          | 144 | 70.94| 111 (54.68)| 33 (16.26)  |
| Separated, Divorced and Widow     | 59  | 29.06| 8 (3.94)  | 51 (25.12)  |
| Widow/Widower                    |     |     |           |             |
| Employment Status                |     |     |           |             |
| Employed                         | 38  | 18.72| 29 (14.29)| 9 (4.43)    |
| Unemployed                       | 165 | 81.28| 78 (38.42)| 87 (42.86)  |
| Source of Support                |     |     |           |             |
| Retirement Benefits              | 77  | 37.93| 53 (26.11)| 24 (11.82)  |
| Family                           | 126 | 62.07| 38 (18.72)| 88 (43.35)  |
| Highest Education                |     |     |           |             |
| Elementary                       | 190 | 93.60| 126 (62.07)| 64 (31.53)  |
| Secondary                        | 13  | 6.40 | 5 (2.46)  | 8 (3.94)    |
| Residence                        |     |     |           |             |
| Not with Family                  | 6   | 2.96 | 4 (1.97)  | 2 (0.98)    |
| With Family                      | 197 | 97.04| 103 (50.74)| 94 (46.31)  |
| Health Conditions                |     |     |           |             |
| No                               | 5   | 2.46 |           |             |
| Yes                              | 198 | 97.54| 89 (43.84)| 109 (53.69) |
| Chronic Disease                  |     |     |           |             |
| Lung Problem                      |     |     |           |             |
| No                               | 198 | 97.54|           |             |
| Yes                              | 5   | 2.46 | 2 (0.99)  | 3 (1.47)    |
| Cancer                           |     |     |           |             |
| No                               | 200 | 98.52|           |             |
| Yes                              | 3   | 1.48 | 1 (0.49)  | 2 (0.99)    |
| Hearing Problem                  |     |     |           |             |
| No                               | 184 | 90.64|           |             |
| Yes                              | 19  | 9.36 | 8 (3.94)  | 11 (5.42)   |
| Type 2 Diabetes Mellitus         |     |     |           |             |
| No                               | 77  | 37.93|           |             |
| Yes                              | 126 | 62.07| 54 (26.60)| 72 (35.47)  |
| Liver Disease                    |     |     |           |             |
| No                               | 198 | 97.54|           |             |
| Yes                              | 5   | 2.46 | 3 (1.47)  | 2 (0.99)    |
| Visual Problem                   |     |     |           |             |
| No                               | 173 | 85.22|           |             |
| Yes                              | 30  | 14.78| 12 (5.91) | 18 (8.87)   |
| Gastrointestinal Problem         |     |     |           |             |
| No                               | 157 | 77.34|           |             |
| Yes                              | 46  | 22.66| 21 (10.34)| 25 (12.32)  |
| Cardiovascular Problem           |     |     |           |             |
| No                               | 98  | 48.28|           |             |
| Yes                              | 105 | 51.72| 63 (31.03)| 42 (20.69)  |
| Musculoskeletal Problem          |     |     |           |             |
| No                               | 146 | 71.92|           |             |
| Yes                              | 57  | 28.08| 31 (15.27)| 26 (12.81)  |

| Mental Status Score for Cognitive Function | Mean | SD  | Range |
|--------------------------------------------|------|-----|-------|
|                                            | 19.09| 6.09| 0 to 30|

Note. f = Frequency; % = Percentage; SD = Standard Deviation. Marital Status (Dichotomized) = Separated, Divorced and Widow/Widower were combined.

4.2. Activities of Daily Living of Participants

Table 2 shows the participants’ basic ADL and IADL profile with overall mean scores of 2.47 (SD = 0.65) and 2.43 (SD = 0.78), respectively. The majority of the participants reported being able to perform all basic ADLs independently (mean range = 2.35–2.50). While most of them needed assistance in doing housework (mean = 2.30; SD = 0.85) and were closely independent in preparing meals (mean = 2.32; SD = 0.82), they were able to perform other IADLs independently (mean range = 2.36–2.65).
Table 2. Activities of Daily Living of Participants (n = 203).

| Activities of Daily Living | Dependent | Needs Assistance | Independent | Mean | Standard Deviation (SD) |
|----------------------------|-----------|------------------|-------------|------|------------------------|
| Basic Activities of Daily Living (Overall) | 2.47 | 0.65 | 2.49 | 0.70 | 2.47 | 0.75 |
| Bathing | 41 | 20.20 | 21 | 10.34 | 141 | 69.46 | 2.49 | 0.70 |
| Dressing | 41 | 20.20 | 20 | 9.85 | 142 | 69.95 | 2.50 | 0.70 |
| Toileting | 41 | 20.20 | 22 | 10.84 | 140 | 68.97 | 2.49 | 0.71 |
| Transferring | 43 | 21.18 | 46 | 22.66 | 114 | 56.16 | 2.35 | 0.82 |
| Continence | 50 | 24.63 | 3 | 1.48 | 150 | 73.89 | 2.49 | 0.73 |
| Feeding | 47 | 23.15 | 13 | 6.40 | 143 | 70.44 | 2.47 | 0.75 |

Instrumental Activities of Daily Living (Overall) | 2.43 | 0.78 | 2.43 | 0.78 |
| Using Telephone | 13 | 6.40 | 45 | 22.17 | 145 | 71.43 | 2.65 | 0.67 |
| Traveling | 16 | 7.88 | 85 | 41.87 | 102 | 50.25 | 2.42 | 0.62 |
| Shopping | 26 | 12.81 | 60 | 29.56 | 117 | 57.64 | 2.45 | 0.86 |
| Preparing Meals | 38 | 18.72 | 63 | 31.03 | 102 | 50.25 | 2.32 | 0.82 |
| Housework | 35 | 17.24 | 72 | 35.47 | 96 | 47.29 | 2.30 | 0.85 |
| Taking Medicine | 40 | 19.70 | 50 | 24.63 | 113 | 55.67 | 2.36 | 0.81 |
| Managing Money | 32 | 15.76 | 30 | 14.78 | 141 | 69.46 | 2.54 | 0.71 |

4.3. Results of Multiple Regression Analysis on Basic Activities of Daily Living

As shown in Table 3, age was significantly and negatively influencing the overall basic ADL (ß = 0.01) and, particularly, in terms of bathing (ß = −0.03, p = 0.022), continence (ß = −0.04, p = 0.016), and feeding (ß = −0.15, p = 0.04). In addition, marital status showed significant and negative influence on the overall basic ADL (ß = −0.14, p = 0.001) and, specifically, in bathing (ß = −0.01, p = 0.002) and continence (ß = −0.05, p = 0.023). Employment status was significantly and negatively influencing the overall basic ADL (ß = −0.03, p = 0.001), which was mostly in bathing (ß = −0.27, p = 0.01). Education revealed significant and negative influence on overall basic ADLs (ß = 0.04, p = 0.003).

Table 3. Results of Multiple Regression Analysis on Basic Activities of Daily Living (n = 203).

| Predictor Variables | Bathing | Dressing | Toileting | Transferring | Continence | Feeding | Overall |
|---------------------|---------|---------|-----------|--------------|------------|---------|---------|
| Gender | 0.35 | 0.547 | 0.19 | 0.568 | 0.07 | 0.550 | 0.08 | 0.866 | 0.19 | 0.556 | 0.01 | 0.231 | 0.18 | 0.835 |
| Age | (0.17) | (0.18) | (0.22) | (0.17) | (0.15) | (0.02) | (0.21) | (0.02) | (0.07) | (0.09) | (0.01) | (0.2) | (0.09) |
| Marital Status | 0.01 | 0.028 ** | −0.25 | 0.281 | −0.17 | 0.391 | −0.06 | 0.907 | −0.04 | 0.016 * | −0.15 | 0.040 * | −0.01 | 0.014 * |
| Employment Status | −0.03 | 0.002 ** | −0.19 | 0.541 | −0.01 | 0.992 | −0.01 | 0.994 | −0.05 | 0.023 * | −0.23 | 0.328 | −0.14 | 0.001 *** |
| Source of Support | −0.07 | 0.010 ** | −0.06 | 0.956 | −0.17 | 0.847 | −0.03 | 0.641 | −0.14 | 0.062 | −0.46 | 0.923 | −0.03 | 0.001 *** |
| Highest Education | −0.14 | 0.281 | −0.05 | 0.923 | −0.09 | 0.099 | −0.04 | 0.512 | −0.41 | 0.707 | −0.45 | 0.657 | −0.04 | 0.003 ** |
| Residence | −0.19 | 0.071 | −0.57 | 0.710 | −0.09 | 0.109 | −0.09 | 0.663 | −0.25 | 0.257 | −0.24 | 0.074 | −0.28 | 0.594 |
| Health Conditions | 0.45 | 0.001 *** | 0.26 | 0.279 | 0.08 | 0.307 | 0.09 | 0.026 * | 0.32 | 0.374 | 0.12 | 0.068 | 0.06 | 0.001 *** |
| Mental Status | 0.48 | 0.010 ** | 7.17 | 0.010 ** | 6.53 | 0.030 * | 6.23 | 0.037 * | 8.85 | 0.006 ** | 9.23 | 0.003 ** | 8.02 | 0.036 * |

Note. f = Frequency; % = Percentage; ADL = Activities of Daily Living. Dependent ADL = Performance mean–range of 2.34–3.00. Needs assistance ADL = Performance mean–range of 1.67–2.33. Independent ADL = Performance mean–range of 2.34–3.00.

R² (Adjusted R²) | 0.660 (0.569) | 0.530 (0.419) | 0.463 (0.361) | 0.554 (0.446) | 0.578 (0.483) | 0.653 (0.548) | 0.681 (0.575) |

Note. Dependent Variables = Six Dimensions and Overall Basic Activities of Daily Living. ß = Unstandardized Coefficients; SE-b = Standard Error; R² = Coefficient of Determination. * Significant at 0.05; ** Significant at 0.01; *** Significant at 0.001.
Meanwhile, presence of health-related problems displayed significant and positive influence on the overall basic ADL ($ß = 0.06, p = 0.001$), which was mainly in bathing ($ß = 0.45, p = 0.001$) and transferring ($ß = 0.09, p = 0.026$). Mental status showed significant and positive influence in all dimensions: bathing ($ß = 9.48, p = 0.01$), dressing ($ß = 7.17, p = 0.01$), toileting ($ß = 6.53, p = 0.03$), transferring ($ß = 6.23, p = 0.037$), continence ($ß = 8.85, p = 0.006$), and feeding ($ß = 9.23, p = 0.003$), and on the overall basic ADL ($ß = 8.02, p = 0.036$). By contrast, gender, source of support and residence did not show any prediction in performing functional abilities in basic ADLs.

4.4. Results of Multiple Regression Analysis on Instrumental Activities of Daily Living

As presented in Table 4, age was significantly and negatively influencing the overall IADL ($ß = -0.42, p = 0.001$) and in terms of traveling ($ß = -0.61, p = 0.013$) and doing housework ($ß = -0.76, p = 0.012$). In addition, marital status showed significant and negative influence on the overall IADL ($ß = -0.43, p = 0.001$) and specifically in shopping ($ß = -0.76, p = 0.019$) and managing money ($ß = -0.88, p = 0.041$). Employment status revealed a significant and negative effect on the overall IADL ($ß = -0.30, p = 0.002$) and mainly in using the telephone ($ß = -0.19, p = 0.018$) and managing money ($ß = -0.86, p = 0.039$). Source of support significantly and negatively predicted the overall IADL ($ß = -0.01, p = 0.028$). Education showed a significant and negative influence on the overall IADL ($ß = -0.47, p = 0.001$) and, particularly, in using the telephone ($ß = -0.51, p = 0.050$), doing housework ($ß = -0.66, p = 0.017$) and managing money ($ß = -0.91, p = 0.002$).

Table 4. Results of Multiple Regression Analysis on Instrumental Activities of Daily Living (n = 203).

| Predictor Variables | Using Telephone | Traveling | Shopping | Preparing Meals | Housework | Taking Medicine | Managing Money | Overall |
|---------------------|-----------------|-----------|----------|----------------|-----------|----------------|----------------|--------|
| Gender              |                 |           |          |                |           |                |                |        |
| $ß$                 | 0.08            | 0.20      | 0.24     | 0.13           | 0.06      | 0.278          | 0.048          | 0.38   |
| Age                 |                 |           |          |                |           |                |                |        |
| $ß$                 | -0.02           | 0.24      | 0.16     | 0.013          | 0.135     | 0.238          | 0.184          | 0.043  |
| Marital Status      |                 |           |          |                |           |                |                |        |
| $ß$                 | -0.05           | 0.045     | 0.16     | 0.10           | 0.193     | 0.046          | 0.089          | 0.086  |
| Employment Status   |                 |           |          |                |           |                |                |        |
| $ß$                 | -0.39           | 0.018*    | 0.198    | 0.127          | 0.129     | 0.127          | 0.218          | 0.116  |
| Source of Support   |                 |           |          |                |           |                |                |        |
| $ß$                 | -0.30           | 0.135     | 0.204    | 0.113          | 0.113     | 0.129          | 0.047          | 0.029  |
| Highest Education   |                 |           |          |                |           |                |                |        |
| $ß$                 | -0.51           | 0.050*    | 0.14     | 0.314          | 0.09      | 0.078          | 0.035          | 0.029  |
| Residence           |                 |           |          |                |           |                |                |        |
| $ß$                 | 0.24            | 0.356     | 0.32     | 0.234          | 0.285     | 0.275          | 0.125          | 0.017  |
| Health conditions   |                 |           |          |                |           |                |                |        |
| $ß$                 | 0.23            | 0.48      | 0.26     | 0.026          | 0.42      | 0.24           | 0.215          | 0.04  |
| Mental Status       |                 |           |          |                |           |                |                |        |
| $ß$                 | 0.73            | 0.026*    | 0.86     | 0.019          | 0.71      | 0.004**        | 0.723          | 0.016  |
| $R^2$ Adjusted $R^2$ | 0.750          | 0.644(0.554) | 0.667(0.584) | 0.620(0.523) | 0.590(0.488) | 0.425(0.338) | 0.493(0.507) | 0.560(0.456) |

Note. Dependent Variables = Seven Dimensions and Overall Instrumental Activities of Daily Living, $ß$ = Unstandardized Coefficients; SE-b = Standard Error; $R^2$ = Coefficient of Determination. * Significant at 0.05; ** Significant at 0.01; *** Significant at 0.001.

On the other hand, the presence of health-related conditions significantly and positively predicted the overall IADL ($ß = 0.41, p = 0.001$) as well as with the four dimensions: traveling ($ß = 0.43, p = 0.02$), shopping ($ß = 0.28, p = 0.047$), preparing meals ($ß = 0.42, p = 0.036$) and taking medicine ($ß = 0.22, p = 0.009$). Mental status showed a significant and positive influence in all dimensions: using the telephone ($ß = 7.23, p = 0.028$),Interrupting ($ß = 8.56, p = 0.019$), shopping ($ß = 7.13, p = 0.031$), preparing meals ($ß = 7.25, p = 0.004$), doing housework ($ß = 7.64, p = 0.043$), taking medicine ($ß = 7.75, p = 0.016$) and managing money ($ß = 7.45, p = 0.024$), and on the overall IADL ($ß = 7.18, p = 0.001$). By contrast, gender and residence did not show any prediction in performing functional abilities in IADLs.

5. Discussion

This study determined the functional status among older Saudi people in performing basic ADLs and IADLs and its relationship to their sociodemographic characteristics, presence of health-related conditions, and mental status. In this study, the prevalence of self-reported Type 2 DM is 62.07%, which is higher than the reported adults’ DM prevalence (16.7%) by the International Diabetes Federation in 2006 [26] and the WHO 2015 report.
(17%) [1]. More than 50% of older Saudi people were suffering from a cardiovascular problem, which is associated with increased mortality and morbidity. This finding is congruent with the study of Alhusain et al. [4] among older Saudi people that showed the prevalence of common non-communicable diseases, including DM and hypertension.

The findings of this study revealed that older Saudi people have moderate cognitive impairment on the basis of their overall MMSE score, which significantly influenced all dimensions of performing basic ADLs and IADLs. This result affirms that other studies that cognitive impairment is a common condition among older people who generally have problems with perception, reasoning, and remembering [27–29]. The findings also showed that older Saudi people were able to perform basic ADLs independently but needed assistance in performing IADLs, particularly in doing housework. These results are supported by studies in the Netherlands [13], the United States [14], Taiwan [30] and in a systematic review conducted by Marengoni et al. [31], indicating that the presence of comorbidities and dependence in performing ADLs increase as age advances. Diabetes and cardiovascular problems are two common health problems identified in this study. This study supports the findings of other studies that DM [14] and cardiac problems [5,6] are associated with impairments in performing ADLs. Additionally, recent research in Spain indicates that older people who have functional unawareness and cognitive impairment may suffer from an early sign of neuropathological burden [19].

In this study, age was significantly and negatively associated with ADLs, which indicated that independence in performing ADLs decreases with the increase in age. This finding supports those of various studies that functional deterioration or increasing dependence on basic ADLs and IADLs becomes evident in older people as their age advances [13,14,20]. Moreover, recent studies in Brazil demonstrate that functional dependence in ADLs [32] and IADLs [32,33] among older people is related with frailty, a critical depletion of physiologic reserve compromising functional status. The presence of health condition was significantly and positively associated with functional status. As the number of concurrent health conditions increases, difficulties in performing ADLs increase. The presence of comorbidities or multiple health conditions has been found to be associated with the decline in function among older people [13,30,31]. Diabetes is associated with mortality and functional deterioration, and cancer with morbidity [13], arthritis with functional deterioration [14,34], and neuropathological burden with functional unawareness and cognitive impairment [19].

The presence of cognitive impairment and comorbidities brought by advancing age has significantly contributed to the deterioration in the performance of IADLs among older people. This finding is supported by Borg et al. [35], in that health and cognitive abilities become impaired increasingly as age advances. This condition contributes to the deterioration in the performance of IADLs. Cognitive function (MMSE) is significantly associated with functional status. This study finds that declining cognitive trajectories are significantly associated with physical function. This finding is similar to those of previous studies indicating that poor physical function coexists with cognitive impairment [27,36]. According to Borg et al. [35], those who are 85 years old and above often have severe or total impairment in their activities of daily living than those in the younger age group.

The results of this study are further supported by the study of Inocian et al. [28], which found a significant relationship between cognitive status and ADL performance among older people. This finding shows that health and cognitive abilities become impaired increasingly as age advances. This condition contributes to the deterioration in the performance of ADLs. Marital status, employment status, source of support, and highest education attained were significantly and negatively associated with functional status. Difficulty in performing ADLs was evident in older people who are unemployed and those with a low education level. Older people with a higher level of education were found to develop dementia more slowly than those with a lower level of educational attainment. This finding suggests that persons with a high level of education are able to maintain high levels of cognitive function, which is similar to previous research [30,37]. However,
highly educated older Spanish people with cognitive impairment who present functional unawareness seem to manifest an early sign of neuropathological burden [19].

6. Conclusions and Implications for Practice

This study revealed that sociodemographic characteristics, mental state, and presence of health problems significantly influenced the functional capabilities of older Saudi people in performing their basic ADLs and IADLs. The findings of this study also supported those of previous research, that declines in physiologic, cognitive, and functional capabilities become noticeable in older people as their age increases. However, more efforts should be exerted to understand the characteristics and the social determinants of health for this population to support the development of evidence-based public health policy and interventions. Social support is essential to the health needs of older people given the functional decline with the increase in age. The findings of this study should be utilized in the nursing academe as a benchmark in building a curriculum that focuses on the health needs, including assistance for cognitive deficits and ADLs, of the older population. Hospital and nursing administrators should initiate educational programs and training for healthcare professionals, including nursing staff, and create policies that ensure adequate health assessment and interventions are rendered to older people who need assistance in performing ADLs. Finally, future research can be conducted with a higher number of older people participating from different hospitals, both private and government, and other regions in Saudi Arabia to attain generalizability of results.

Limitations of the Study

This study inherits few limitations. This study used a convenience sampling method and was conducted in only one institution, which may limit the generalizability of the results. Additionally, the cross-sectional nature of this study hindered the examination of causal relationships between variables.

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