Investigating the Impact of Chronic Diseases and Disability on Quality of Life in Saudi Arabian Patients

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Abstract

Background and Objective: With greater life expectancy comes an increased risk of chronic diseases, which can lead to disability. This study aimed to investigate the relationship between chronic diseases and the development of disability, as well as their impact on quality of life (QoL). **Methods:** From March to May of 2024, a cross-sectional survey was conducted in Riyadh, Saudi Arabia. Participants in the study were approached in a range of locations, such as disability centres, hospitals, health clinics, community gatherings, charity events, and health camps. The participants were given link to online questionnaires supplied via Google Forms. With SPSS-IBM 2023, the descriptive analysis was carried out. A significance level of $P < 0.05$ was applied to all comparisons. A binary regression analysis was done to determine factors that influence the QoL of the participants, while a multinomial regression analysis was carried out to explore factors that triggered the difficulty due to disability. **Results:** Of the 394 study participants, 70.8% were female and represented a range of age categories. Thirty-seven percent of the participants held a degree or higher education, and more than half of them—54 percent—were married. Compared to individuals without a disability, people with mild or severe disabilities are 2.355 times more likely to report a decline in QoL. There is a considerable chance that participants' quality of life will decline when the number of chronic diseases rises from one to two or more. The quality of life (QoL) significantly improved 1.943 times among married individuals compared to those who lived alone. Growing older is linked to notable shifts in attaining a high quality of life. In general, women suffered from higher levels of disability than men did; people with good quality of life and physical activity were less likely to have higher disability indices. **Conclusion:** According to the study's findings, the number of chronic illnesses and the onset of difficulty are related, and both considerably lower quality of life. Stabilizing quality of life, preventing disability, and managing chronic diseases all require effective processes involving patients, family members, and healthcare providers.

Key words: Chronic diseases, Disability, Life expectancy, Multimordibity, Quality of life, Saudi Arabia

INTRODUCTION

The Saudi population's life expectancy has climbed to 77.6 years, up from 74 years in 2016, as a result of enhanced healthcare facilities, increased resource availability, and the implementation of health promotion principles in all policies and elements of life.[1] Multimorbidity is a potential threat with advancing age. These uncontrolled morbidities

can affect adults, elderly individuals, and children of any gender.[2-4] About 30.3% of the 2047 patients in the Alhabib *et al.* study[5] had hypertension, 25.1% had diabetes, 49.6% were obese, and 32.1% had dyslipidemia. It is a challenge to the health system due to the physical, cognitive, and psychosocial repercussions in addition to the compounding effect of coexisting conditions.[6]

Multimorbidity has a significant and continuous correlation with poor health outcomes, including death, higher use of health and social services, polypharmacy, impairment and reliance, and worse quality of life (QoL).[6-8] The majority of research has discovered a connection between older adults' worse QoL and the existence of chronic illnesses,[7,9] although this association was not particularly examined in the multimorbidity group. Research has also demonstrated the impact of the rising number of chronic illnesses and disease patterns on QoL.[9,10] Less is understood, though, about the factors mediating this link. Age, sex, depression, social support, and socioeconomic level are examples of sociodemographic, emotional, and economic factors that have been proposed as intermediary factors between chronic conditions and QoL.[11-13]

The basis for the relationship between multimorbidity and QoL can be found in the international classification of functioning, disability, and health (ICF)[14] paradigm. According to the ICF framework, disability is defined as a negative outcome of the "dynamic interaction between a person's health condition, environmental factors, and personal factors"[15] and a deficit in any one of three domains (body functions and structure, activity, and participation). QoL may be adversely affected by any medical condition that causes deficiencies in bodily functions, limits one's activities, or prohibits one from participating in certain activities.[16] Impairment and multimorbidity have a clear correlation,[6,9] with some research demonstrating both multiplicative and additive impacts of the mix of diseases on impairment.[17-19]

The purpose of this study was to ascertain how multimorbidity chronic illnesses affected QoL and disability. The particular goals were to: (1) identify the frequency of specific chronic diseases among the people living in Riyadh City, Saudi Arabia; (2) determine the effect of the chronic conditions on functional status and QoL; and (3) examine the ways in which disability affects the relationship between the chronic conditions and QoL.

MATERIALS AND METHODS

Research design, participants, and settings

This study examined the association between chronic illnesses, disability, and QoL. It was conducted in Riyadh, Saudi Arabia, from March to May of 2024. The participants were approached in a number of locations, including disability centers, hospitals, health clinics, community gatherings, charity events, and health camps. They were provided links to online surveys generated with Google Forms, which required them to scan QR codes. They had the option of working with their attendant, who typed their responses into the Google Form on their behalf or working alone. If there were any questions, the interviewer was ready to answer them.

ELIGIBILITY REQUIREMENTS

Inclusion criteria

People aged 18 years and above who are suffering from a chronic disease with stable mental health were included in the study.

Exclusion criteria

Patients with chronic diseases have mental illness and those who are <18 years were excluded from the study.

Sample size calculation

With a 5% margin of error and a 95% confidence level, the sample size for our study was determined to be 377 using the online sample size calculator at http://www.raosoft.com/samplesize.html. There were 394 participants in our study overall.

Questionnaire development and validation

With the aid of published literature, the questionnaire was developed. The questionnaire was divided into three pieces. Items pertaining to sociodemographic traits were found in part I, while items for evaluating disability were found in section II. The patients' disability level and profile were evaluated using the 12-item WHO Impairment Assessment Schedule 2.0 (WHODAS 2.0), a quick, straightforward, and easy-to-administer assessment tool that may be utilized in both clinical and general population settings (https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health/who-disability-assessment-schedule).

The WHOQOL-BREF instrument was used to collect data on the QoL questions in the third segment. This 26-item test has four domains: social connections (3 items), psychological health (6 items), physical health (7 items), and environmental health (8 items). QOL and general health items are also included.

The generated questionnaire was translated into Arabic using a forward and backward approach. With the assistance of bilingual scientific specialists in the subject, the

questionnaire's construct, content, and criteria validity were verified.

Ethical consideration

The research proposal of the study was approved by AlMaarefa University's Institutional Ethical Committee with reference number IRB24-024/01 dated March 25th, 2024. Participation was voluntary since participants were given the choice to accept or decline the study's terms and conditions, including informed consent. Those who could not read for themselves were given an oral explanation of the informed consent's contents.

Statistical analysis

The gathered information was loaded into IBM's statistical software, SPSS (version 25). The sociodemographic features of the research sample were first subjected to univariate descriptive analysis, and then, a bivariate analysis utilizing the Pearson Chi-square test was carried out. The level of impairment was measured using the WHO Impairment Assessment Schedule 2.0 (WHODAS 2.0), and multinomial regression analysis was performed to evaluate the factors that influence the development of disability. The QoL was assessed using the WHOQOL-BREF. Four domains – physical, psychological, social, and environmental – had their key values determined. To ascertain the effect of independent factors, such as sociodemographic variables and the degree of difficulty resulting from a disability, on the participants' overall QoL, a binomial regression analysis was conducted. The outcomes are displayed as the odds ratio. For all statistical purposes, $P < 0.05$ will be considered significant.

RESULTS AND DISCUSSION

Sociodemographic characteristics of the participants

Table 1 illustrates the demographic characteristics of the study participants. The majority were female (70.8%), spanning various age groups. Over half of the participants were married (54%), while 30.7% had achieved a degree or higher education. A significant portion of the participants resided in the eastern region (64.7%), contrasting with a minority from the western region (3.3%). Around half were employed, with 25.9% reporting no income source. The study cohort predominantly consisted of Saudi nationals.

Prevalence of chronic diseases

The study participants exhibited a range of prevalent chronic diseases, with diabetes mellitus being the most common at 38.4%. Following closely were bronchial asthma at 36.1%

and hypertension at 34.7%. In additiona, other frequently observed chronic conditions included cardiac ailments, osteoarticular diseases, thyroid diseases, cancer, mental health disorders, and stroke [Figure 1]. These findings highlight the diverse health challenges present among the study population, underscoring the need for comprehensive management strategies targeting these prevalent conditions.

Health status of the participants

Table 2 presents several key aspects of the study participants' health and well-being. More than half of the participants reported having good health, and three-fourths indicated having more than two close relatives who support them in managing their health effectively. However, 44.9% expressed having some concerns in life. Two-thirds of the participants reported having a single chronic disease, and a similar percentage engaged in regular physical activity. Approximately a quarter of the participants had a body mass index over 30, indicating obesity. Regarding disability, more than 60% reported no difficulty at all, while 31% experienced mild disability, and around 7% reported moderate-to-severe difficulty due to disability. These findings provide insights into the health status, social support, chronic disease prevalence, physical activity levels, obesity rates, and disability impact among the study participants.

QoL of the participants

Table 3 illustrates various domains of QoL and the corresponding satisfaction levels among the study participants. Nearly, equal proportions of participants expressed satisfaction with the environmental, psychological, and physical domains of their QoL. Satisfaction with the social domain of QoL was higher compared to those who were not satisfied. The overall satisfaction rate with QoL was 48.5%, which is lower than the satisfaction rates observed in individual domains of QoL. These findings highlight varying levels of satisfaction across different aspects of life quality among the study participants, underscoring the need for targeted interventions to enhance overall QoL satisfaction.

Factors that influence the QoL of the participants

Table 4 presents factors influencing the overall QoL among the study participants:
- Transition from no disability to mild/moderate disability: Participants experiencing mild or moderate disability are 2.355 times more likely to report a decrease in QoL compared to those with no disability. Disability status significantly impacts QoL, indicating higher levels of impairment correspond to lower QoL ratings
- Number of chronic diseases: As the number of chronic diseases increases from one to two or more, there is a

Characteristics	Variables	Frequency	Percentage
Gender	Female	279	70.8
	Male	115	29.2
Age	18–25	109	27.7
	26–35	94	23.9
	36–45	88	22.3
	≥46	103	26.1
Marital status	Single	179	45.4
	Married	215	54.6
Education	Upto high school	107	27.2
	Secondary school	166	42.1
	Graduates and higher studies	121	30.7
Location	Middle region or around it	85	21.6
	Western region or around it	13	3.3
	Eastern region or around it	255	64.7
	Southern region or around it	17	4.3
	Northern region or around it	24	6.1
Employment status	Employed	194	49.2
	Unemployed	88	22.3
	Inactive	23	5.8
	Student	89	22.6
Income status	<5000 SAR	72	18.3
	5000–10000 SAR	65	16.5
	10000–20000 SAR	80	20.3
	More than 20000 SAR	75	19.0
	No income	102	25.9
Nationality status	Saudi	339	86.0
	Non-Saudi	55	14.0

Table 1: Sociodemographic characteristics of the participants
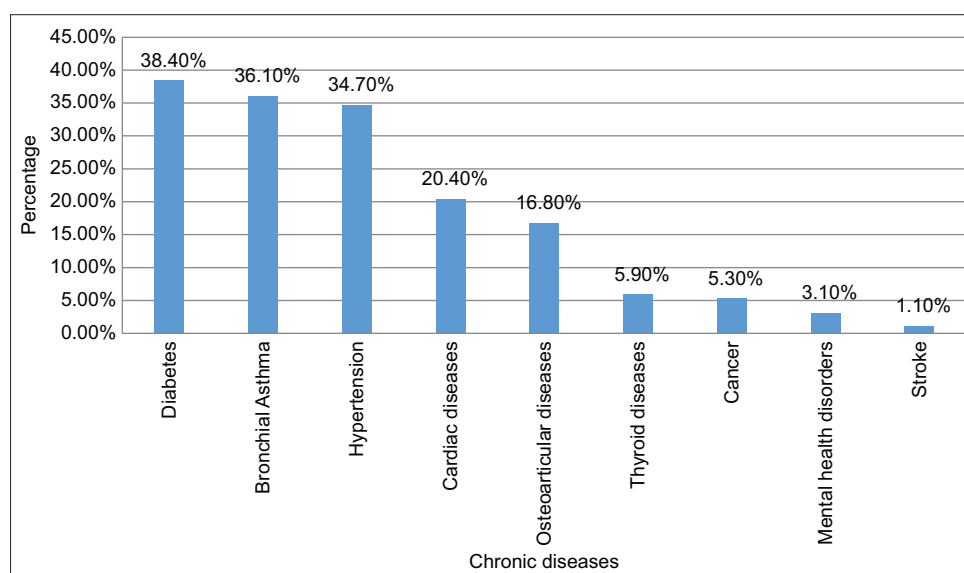
Figure 1: Prevalence of chronic diseases among participants

Table 2: Health status of the participants			
Characteristics	**Variables**	**Frequency**	**Percentage**
Self-assessment of health	Bad	16	4.1
	Average	157	39.8
	Good	221	56.1
Number of close people	None	41	10.4
	One	50	12.7
	Two or more	303	76.9
Presence of concerns	No	217	55.1
	Yes	177	44.9
Number of chronic diseases	One	265	67.3
	Two	50	12.7
	More than two	79	20.1
Physical activity	Active	269	68.3
	Inactive	77	19.5
	Unknown	48	12.2
BMI type	Below 18.5	17	4.3
	18.5–24.9	182	46.2
	25–29.9	95	24.1
	30 or more	100	25.4
Status of disability	No difficulty	240	60.9
	Mild difficulty	124	31.5
	Moderate to severe difficulty	30	7.6

BMI: Body mass index

Table 3: Satisfaction ratings of the participants			
Characteristics	**Variables**	**Frequency**	**Percentage**
Overall QoL	Satisfied	191	48.5
	Not satisfied	203	51.5
Physical domain QoL	Satisfied	200	50.8
	Not satisfied	194	49.2
Psychological domain QoL	Satisfied	199	50.5
	Not satisfied	195	49.5
Social domain QoL	Satisfied	233	59.1
	Not satisfied	161	40.9
Environmental domain QoL	Satisfied	195	49.5
	Not satisfied	199	50.5

QoL: Quality of life

- Age: Increasing age is associated with significant changes in achieving overall QoL. Age-related factors such as health status, social support, and personal resilience play crucial roles in shaping QoL perceptions over time.

These factors underscore the complex interplay between health status, social dynamics, and personal circumstances in determining the overall QoL among the study participants. Targeted interventions addressing disability management, chronic disease burden, marital support, and age-related challenges can potentially enhance QoL outcomes in this population.

Factors that influence the disability status in the study participants

Model 1: Likelihood of developing mild disability

- Gender differences: The model suggests that females in the study are more likely to develop mild disability compared to male participants. This could be due to various factors such as differences in biological susceptibility, health-seeking behavior, or sociocultural factors affecting health outcomes
- Physical activity satisfaction: Patients who are dissatisfied with their physical activity have a 2.09 times

significant risk of reduced QoL among participants. Multiple chronic conditions contribute to a cumulative burden on health and well-being, thereby affecting overall QoL negatively
- Marital status: Participants who transition from single to married status show a significant improvement in QoL by 1.943 times. Marriage often provides emotional support, companionship, and a sense of stability, contributing positively to overall QoL

Table 4: Binary regression analysis to compare the overall QoL with other independent variables

Independent variables	*P*-value	Odds ratio	95% Confidence interval	
			Lower	Upper
Physical activity	0.561	0.909	0.658	1.255
BMI type	0.564	0.923	0.702	1.213
Status of disability	**0.000**	**−2.355**	**1.608**	3.449
Gender	0.461	1.198	0.741	1.936
Age	**0.022**	**0.727**	**0.553**	**0.955**
Marital status	**0.025**	**1.943**	**1.088**	**3.469**
Education	0.592	1.089	0.797	1.489
Region	0.387	0.912	0.741	1.123
Nationality	0.733	0.897	0.482	1.672
Employment	0.925	1.011	0.812	1.258
Income	0.658	1.034	0.891	1.201
Number of close people	0.886	0.976	0.702	1.357
Number of concerns	0.665	1.117	0.678	1.840
Number of chronic diseases	**0.008**	**−1.599**	**1.130**	2.261

BMI: Body mass index, QoL: Quality of life, Bold value: Significant

higher likelihood of developing mild disability than those who are satisfied. This finding underscores the importance of physical activity in maintaining physical function and preventing disability. Lack of satisfaction with physical activity might lead to reduced engagement, lower physical fitness, and ultimately, a higher risk of mild disability

- Overall QoL: Individuals dissatisfied with their overall QoL are significantly more likely to develop mild disability compared to those without chronic diseases. QoL encompasses various aspects such as physical, mental, and social well-being. Chronic diseases can impact overall QoL negatively, which, in turn, may exacerbate disability risk through reduced functional capacity, increased symptom burden, and diminished psychological resilience [Table 5].

Model 2: Likelihood of developing moderate-to-severe disability

- Marital status and education: Single individuals and those with lower levels of education are more likely to develop moderate-to-severe disability compared to married individuals and those with higher education, respectively. Marriage often provides social and emotional support, which can positively influence health outcomes. Higher education correlates with better health literacy, access to resources, and potentially healthier lifestyles, all of which contribute to lower disability risk
- Physical activity satisfaction: Similar to mild disability, dissatisfaction with physical activity is associated with a higher likelihood of developing moderate-to-severe disability. Regular physical activity promotes cardiovascular health, muscle strength, and joint flexibility, all of which are critical in preventing severe disability
- Overall QoL: Individuals dissatisfied with their overall QoL also face a significant likelihood of developing moderate to severe disability. Poor overall QoL can exacerbate chronic health conditions, increase stress levels, and impair coping mechanisms, thereby accelerating disability progression.

Scientific insights and implications

- Biopsychosocial model: Disability is influenced by a complex interplay of biological (gender and chronic diseases), psychological (QoL and satisfaction), and social (marital status and education) factors. Understanding these interactions helps in developing targeted interventions to prevent or manage disability.
- Preventive strategies: Enhancing physical activity satisfaction and improving overall QoL through holistic approaches (e.g., health education and social support networks) could mitigate disability risk across different demographic groups
- Health-care interventions: Health-care providers can use these findings to tailor interventions that address specific risk factors associated with disability, thereby improving patient outcomes and QoL.

In summary, the models highlight the multifaceted nature of disability risk and underscore the importance of addressing physical, psychological, and social determinants to mitigate disability progression effectively.

Study implications

Our study documented a significant level of disability among people suffering from more than two chronic diseases. The level of difficulty due to chronic disease-induced disability is also inversely related to the QoL. An earlier study that evaluated the QOL of people with normal and chronic disease-induced disabilities found that people with disabilities had significantly worse QOL scores across the majority of WHOQOL-BREF domains. In a previous study[20] conducted by our team on disabled individuals, we observed higher mean values for each domain of QoL. However, in the present study, we found a decline of at least 10% across most QoL domains. This decline suggests that disabilities induced by chronic diseases have significant implications for overall QoL. These findings highlight the profound impact of chronic diseases on various aspects of

Table 5: Multinomial regression analysis to compare the disability status with independent variables

Status of disability	Significant	Odds ratio	95% Confidence interval for odds ratio	
			Lower bound	Upper bound
Mild disability				
Intercept	0.330			
Gender	**0.001**	**−0.375**	**0.206**	**0.684**
Age	0.305	1.174	0.864	1.595
Marital status	0.418	0.766	0.402	1.461
Education	0.134	0.768	0.544	1.085
Region	0.508	1.084	0.855	1.374
Nationality	0.423	0.736	0.348	1.557
Employment	0.192	0.844	0.655	1.089
Income	0.981	1.002	0.845	1.188
Number of close people	0.908	0.978	0.668	1.432
Number of chronic diseases	0.263	0.817	0.574	1.164
BMI type	0.766	1.048	0.771	1.424
Physical activity	**0.000**	**2.095**	**1.487**	**2.950**
Overall QoL	**0.000**	**−0.383**	**0.233**	**0.628**
Moderate-to-severe				
Intercept	0.414			
Gender	0.553	1.336	0.513	3.475
Age	**0.005**	**2.213**	**1.277**	**3.834**
Marital status	0.046	−0.319	0.104	0.978
Education	**0.041**	**−0.488**	**0.245**	**0.971**
Region	0.174	1.353	0.875	2.092
Nationality	0.635	1.320	0.419	4.159
Employment	0.850	1.047	0.654	1.675
Income	0.236	0.832	0.614	1.127
Number of close people	0.101	0.608	0.336	1.102
Number of chronic diseases	0.445	1.267	0.691	2.323
BMI type	0.517	0.834	0.481	1.444
Physical activity	**0.001**	**2.731**	**1.495**	**4.989**
Overall QoL	**0.001**	**−0.200**	**0.077**	**0.521**

BMI: Body mass index, QoL: Quality of life, Bold value: Significant

individuals' lives, underscoring the need for comprehensive support and interventions to mitigate the negative effects on QoL. Understanding these implications can guide healthcare strategies aimed at improving the well-being and QoL of individuals living with chronic disease-induced disabilities.

The decline in the majority of QOL domain mean scores might be attributed to the negative effects of impairment on health. This could be explained by arguing that people with disabilities have more challenges in achieving a satisfying QoL because they are unable to begin or maintain the kinds of interactions and relationships that people in good health do.

CONCLUSION

The study's findings underscore a significant correlation between the prevalence of chronic diseases and the subsequent onset of disability, highlighting their substantial collective impact on diminishing QoL. Addressing these challenges necessitates the implementation of effective

strategies involving health-care professionals, patients, and their families. Collaborative efforts are essential for managing chronic conditions, preventing disability, and maintaining or enhancing QoL. By promoting proactive health-care interventions and fostering supportive environments, stakeholders can collectively contribute to the well-being and resilience of individuals affected by chronic diseases.

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