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REVIEW

Application of the EQ-5D in the Middle East: A Systematic Review Focusing on Patients Living in the Kingdom of Saudi Arabia

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Abstract: Patients' quality of life (QoL) and reported outcomes are critical indicators of the burden of a disease and the benefits of healthcare intervention. This systematic review explores publications that have adapted the EQ-5D for use with a population living in Saudi Arabia. The review of the following databases: MEDLINE, EMBASE, Wiley's Database, EBSCO, and ClinicalTrials.gov was conducted on December 1, 2020. The search strategy was adapted from the SPIDER search tool, and the included articles were classified by author, year of publication, region, disease of interest, sample size, type of EQ-5D, and format. Level of EQ-5D was classified as either 3L or 5L. Thirteen articles met the search inclusion criteria. The earliest publication was conducted in 2015 and the latest in 2020. These studies were conducted in four Saudi administrative regions, and multiple conditions or treatments were studied, the most studied condition being diabetes mellitus, followed by musculoskeletal disorders, back pain, and injuries. This systematic review article finds that the EQ-5D has been well adapted in the KSA. However, continued work is needed to investigate the quality of life for major conditions such as cardiovascular disease and cancer. Moreover, QoL research is lacking in certain regions, such as southern and northern Saudi Arabia. Despite the successful application and validation of the EQ-5D, a local QoL tool is needed to capture the unique context of patients within the healthcare system in the Middle East.

Keywords: EQ-5D in the Middle East, QoL in the KSA, health utilities

Introduction

The EQ-5D tool is used to deliver patient-reported outcomes (PROs) by measuring health status.[1] It was developed by the Research Foundation and an association of groups under the EuroQol umbrella.[1] Patients' quality of life (QoL) and reported outcomes are critical indicators of the burden of a disease and the benefits of healthcare intervention.[2] These measurements are key parameters for decision making based on pharmacoeconomic analysis.[2] Many international health technology assessment (HTA) bodies have adapted PROs as part of their decision making process, and this has resulted in EQ-5D becoming one of the world's most used tools.[3–5] For example, the National Institute for Health and Care Excellence in the United Kingdom prefers the EQ-5D and has adopted a specific methodology for its use.[3]

The main domains covered are mobility, usual activities, self-care, pain and discomfort, and anxiety and depression, as reflected by the five in the name EQ-5D.

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The EQ-5D can be administered in different formats, including using paper, smartphones, laptops, or more.[1] All answers are self-reported, and a range of responses are collected that reflect the degree of problem patients face in each domain depending on the survey's level of use; 3L or 5L. Beyond these domains, the EQ-5D scales QoL on a visual analog ranging from 0, or the worst health respondents can imagine, to 100, or the best.[1,6] These collected answers give health practitioners and policymakers health scores other than the traditional surrogate endpoints.[7] The EQ-5D's importance has seen it translated into numerous languages and dialects.[8] Additionally, researchers have applied various validation techniques to all aspects of the QoL tool.[9–11]

The EQ-5D is a generic measure of QoL, applicable to a variety of disease conditions and states.[1] The EuroQol group set out to develop a brief and practical questionnaire that would allow researchers to compare different patient populations,[12] and many researchers have indeed applied EQ-5D to a range of diseases, treatments, and measurements.[13–15] Although some researchers have used the EQ-5D with a Middle Eastern population, much of the literature focuses on Western societies.[15] Healthcare Utilities should be calculated based on specific populations, considering that sociodemographic context could influence QoL scores.[16,17] Accordingly, this systematic review explores publications that have adapted the EQ-5D for use with a population living in Saudi Arabia.

Materials and Methods

A systematic review was conducted on December 1, 2020, of the following databases: MEDLINE, EMBASE, Wiley's Database, EBSCO, and ClinicalTrials.gov. The search strategy was adapted from the SPIDER search tool and is detailed in Table 1.[18] All identified titles and abstracts were scanned to confirm that the associated article met the inclusion criteria, which was that it had to be an original article published fully and conducted in the KSA using the EQ-5D instrument to describe a medical condition or treatment. Articles' reports of the descriptive part of the EQ-5D instrument or the visual analog score were then scanned.

Ultimately thirteen articles were identified. Figure 1 shows the articles included and excluded after application of the SPIDER tool. Included articles were classified by author, year of publication, region, disease of interest, sample size, type of EQ-5D, and format. Year of publication was adapted to ensure a uniform comparison, as some studies had been conducted during different calendar years. Region was identified by linking the site of the study to Saudi Arabia's thirteen official administrative regions.[19] Level of EQ-5D was classified as either 3L or 5L. EQ-5D levels were established earlier, reflecting three levels of each of the five dimensions measured: no problems, small or moderate problems, and extreme problems. The 3L yields in maximum of health status that was equivalent to 243,[20,21] whereas the five-level EQ-5D was established later, indicating no, slight, moderate, severe, or extreme problems, summing to a health status of 3125.[20,21]

We focused on three themes of analysis when comparing the selected articles: patient population, time, and place. Our approach was inspired by the work of Costanza et al.[22] According to them, QoL is a multidimensional theory that captures multiple needs for individuals, communities, nations, and global use. A QoL scale should thus be designed to capture a value for a group of people in a certain place at a certain time.[22] In our review, we compare our selected articles quantitatively and qualitatively across different diseases, publication times, and country regions.
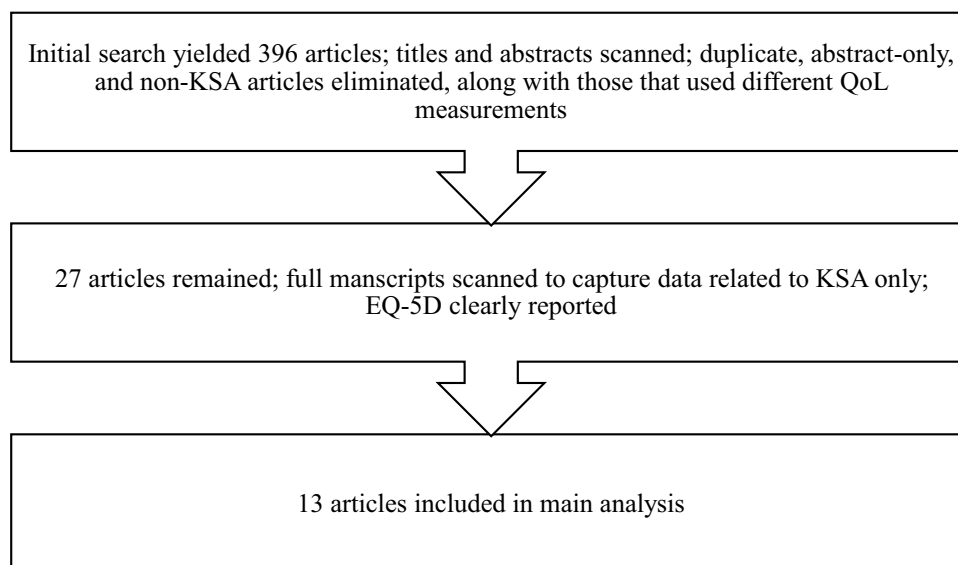
Results and Discussion

Thirteen articles met the search inclusion criteria. The earliest publication was conducted in 2015 and the latest in 2020. These studies were conducted in four Saudi administrative regions, and multiple conditions or treatments were studied. Table 2 shows the characteristics of the reviewed studies.

Comparison of Results by Condition or Treatment

The most studied condition was diabetes mellitus (n=4),[23–26] followed by musculoskeletal disorders, back pain, and injuries (n=3).[27–29] The remaining articles focused either on a specific condition, such as urinary

Table 1 Description of SPIDER Search Tool

SPIDER	Description
Sample	Population from Saudi Arabia
Phenomenon of Interest	Comorbid condition or treatment
Design	Quantitative data
Evaluation	Used EQ-5D instrument
Research type	Original article; full article

Initial search yielded 396 articles; titles and abstracts scanned; duplicate, abstract-only, and non-KSA articles eliminated, along with those that used different QoL measurements

27 articles remained; full manscripts scanned to capture data related to KSA only; EQ-5D clearly reported

13 articles included in main analysis

Figure 1 Article selection process.

tract infections,[30] chronic obstructive pulmonary disease,[31] or multiple sclerosis;[32] on a treatment, such as teriparatide,[33] warfarin, or apixaban;[34] or on a nonspecific condition.[35] For all the reviewed studies, only one study reported the Cronbach's alpha value of 0.72, which could indicate an acceptable reliability and an opportunity for enhancement.[35]

The sample size of each study was related to the condition of interest. Out of a summed sample equal to 2025 patients, 36% had diabetes,[23–26] —unsurprising considering that the prevalence of diabetes in the KSA exceeds 14% of the population.[36] The second largest sample study was patients who had cardiovascular diseases, which also affect millions in the KSA.[36]

Four articles reported EQ-5 dimensions and covered two medical conditions, diabetes and multiple sclerosis. For the diabetes studies, the results were consistent, with the majority of enrolled patients reporting no problems with mobility, self-care, usual activities, or anxiety and depression. However, a high percentage of patients who had diabetes reported slight problems with pain and discomfort. A higher percentage of patients with multiple sclerosis reported extreme difficulties with mobility, self-care, usual activities, anxiety and depression, and pain and discomfort.

Interestingly, some local quality-of-life figures align with international results obtained using the EQ-5D. Saudi patients who had atrial fibrillation reported an average EQ-VAS score of 67.99. Similarly, Brüggenjürgen et al collected

EQ-VAS scores from the European Registry in Atrial Fibrillation (PREFER in AF) and obtained a similar average score of 68.80.[37] By contrast, Alanazi (2020) explored QoL in women treated for UTI and reported a utility index of 0.524, lower than those reported in international studies and equivalent to females who had a resistant UTI (0.565), as reported by Abrahamian et al (2011), whose study was conducted in the United States and used SF-36, mapped to the EQ-5D index.[38,39]

Comparison of Results by Date

A chronological review of the data reveals an increase in research using the QoL tool between 2015 and 2020. The first publication concerning the EQ-5D in the KSA appeared in 2015, with another following in 2017. About two-thirds of the reviewed publications were released in 2020. Moreover, the average VAS score has increased, with patients who had type 2 diabetes scoring 71 in 2020 compared with a score of 68.5 in 2015. These results indicate growing interest among Saudi scholars in patients' QoL. Indeed, great investments have been made in the Saudi healthcare system infrastructure, with QoL a major indicator of return on investment.

Another important explanation for the increased number of publications using EuroQol is its availability in an Arabic format. Alaboudi (2016) explored the QoL using the EQ-5D in a form produced by a group of local translators.[26] Translating a QoL tool can be an imposing additional challenge for a researcher and requires

Table 2 Characteristics of the Reviewed Articles

Article	Year	Region	Disease	Sample #	Type of EQ-5D	Format
Algarni et al[27]	2020	Makkah (Taif)	Musculoskeletal disorders	153	EQ-5D-3L	Self-report questionnaire
Alshayban and Joseph[23]	2020	Eastern Province	Type 2 diabetes	378	Q-5D-5L	Interview
Althemery et al[34]	2020	Riyadh	AF patients	388	Q-5D-5L	Paper
Elsalmawy et al[33]	2020	Not specified	Patients using Teriparatide F	364	EQ-5D-5L	Self-report questionnaire
Abdelbasset et al[28]	2020	Alkharj;	Chronic nonspecific low back pain	60	EQ-5D-3L	Self-report questionnaire
Alanazi[30]	2020	Riyadh	Urinary tract infection	131	EQ-5D-3L	Self-report questionnaire
Almasri et al[24]	2020	Jeddah	Type 2 diabetes	339	Q-5D-5L	Interview
Alghnam et al[29]	2020	Riyadh	Blunt trauma	249	EQ-5D-5L	Interview
Gelhorn et al[25]	2020	Jeddah, Riyadh, and Dammam	Type 2 diabetes	310	EQ-5D-5L	Self-report questionnaire
Bekairy et al[35]	2018	Riyadh	No specific disease	80	EQ-5D-3L	Interview
Kokturk et al[31]	2018	All	Chronic obstructive pulmonary disease	206	EQ-5D-3L	Self-report tool
Algahtani et al[32]	2017	Jeddah	Multiple sclerosis	292	EQ-5D-5L	Interview
Al-Aboudi et al[26]	2015	Riyadh	Type 2 diabetes	75	EQ-5D-3L	Self-report tool

a substantial budget.[40] In recent years, EuroQol has made an Arabic-format version of the EQ-5D readily available, with many researchers validating and modifying the tool, even to the point of covering certain Arabic dialects.[35,41] At the end of 2020, more than 109 EQ-5D tools were available for different dialects and platforms.[42]

Comparison of Results by Region

Only three of the thirteen official administrative Saudi Arabian regions have been studied: Riyadh,[26,29,30,34] Makkah,[24,27,32] and Dammam.[23] Riyadh likely accounts for more publications, being the capital of the KSA and home to many hospitals and universities.[43,44] Diabetes mellitus was studied across three regions: Riyadh,

Jeddah, and Dammam. Generally, average EQ-5D scores were similar, but females living in the Riyadh region had lower EQ-5D scores than those living in Jeddah.[24,26]

Most studies used the Arabic (Saudi) format of the EQ-5D, but they differed in how they administered the survey. Regions other than Riyadh relied on an interviewer administering the survey, whereas studies from the Riyadh region were mostly conducted through self-administration on paper. Even so, results for similar conditions were equivalent. It is worth noting that the EQ-5D is designed to be self-reported by patients, and an interviewer administrating it might introduce a "Hawthorne Effect," where participants' answers

could be influenced by the presence of the interviewer.[45]

One important finding is the lack of research on QoL for patients living in northern and southern Saudi Arabia. The Saudi government has announced a new transformative vision for 2030, one of which is to improve the quality of healthcare while maintaining the efficacy of spending.[46] Continued investigation of QoL is thus needed, particularly for underserved regions.

Conclusion

This systematic review article finds that the EQ-5D has been well adapted in the KSA. However, continued work is needed to investigate the quality of life because QoL currently focuses on conditions such as diabetes even though major conditions such as cardiovascular disease and cancer remain poorly studied. Moreover, QoL research is lacking in certain regions, such as southern and northern Saudi Arabia. Despite the successful application and validation of the EQ-5D, a local QoL tool is needed to capture the unique context of patients within the healthcare system in the Middle East.

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Disclosure

The author reports no conflicts of interest in this work.

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