Health-Related Quality of Life Among Individuals with Visual Conditions Requiring Eyecare During COVID-19 Lockdown.

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Abstract

Background: Individuals with chronic vision diseases need regular ophthalmic follow-up. However, access to non-urgent ophthalmic services was limited in areas of strict lockdown during SARS-COV-2 (COVID-19) pandemic. This article aimed to assess Health-Related Quality of Life (HRQoL) and its predictors in individuals with chronic vision conditions during COVID-19 lockdown.

Methods: A cross-sectional, survey-based study targeted Jordanians adults with variety of chronic vision conditions require regular ophthalmic follow-up. Outcome measures included HRQoL measured by 12-item Short Form health survey (SF-12), mental health symptoms measured by Depression Anxiety Stress Scale (DASS 21), vision ability measured by the National Eye Institute Visual Functioning Questionnaire (VFQ-25) *General Vision and Role Limitation* subscales. Data were analyzed descriptively and using a multiple variable linear regression to identify HRQoL predictors.

Results: A total of 201 participants completed the study with a mean age of 52.09 (± 15.41) years and SF-12 mean score of 57.90 (± 18.15). Level of HRQoL was significantly and negatively predicted by VFQ-25 *Role Limitation* subscale, presence of diabetes, the need of ophthalmic follow-up during lockdown, and stress. The regression model explained 47.1% of the variance in HRQoL ($r^2=0.471$, $F=35.57$, $P<0.001$).

Conclusions: Jordanian individuals with chronic vision conditions requiring non-urgent ophthalmic follow-up demonstrated a relatively low level of HRQoL during COVID-19 lockdown. Participants also showed adverse impact on mental health and reported low accessibility to ophthalmic care. Access to non-urgent ophthalmic care in individuals with chronic vision diseases should be carefully considered by healthcare administrations and policymakers for optimal service planning during pandemics and crises.

Background

The world has been experiencing extraordinary stressful situation due to COVID-19 pandemic.(1) Many countries worldwide (including Jordan) adopted very strict procedures to enhance public safety. Example of these procedures included curfew, quarantine, social distancing, and working from home (2). Such strict procedures might be associated with adverse impact on physical and mental health and financial stress (3). Globally prevalent health threatening conditions are thought to have great health and socio-economic impact, predominantly on individuals of lower socio-economic status.(4, 5).

Jordan is a country in the Middle East with a well-established healthcare systems (6). Jordan has started initial safety procedures related to COVID-19 on February 27th 2020. The procedures started by banning non-Jordanian travelers from visiting Jordan and reached its peak on March 18th up to May 9th where a total lockdown was adopted. In this lockdown, curfews were enforced, public and private sectors were closed, and non-emergency medical services (including ophthalmic care) were suspended. Eyecare services were very limited, and only individuals with urgent conditions were allowed to reach emergency facilities via civil defenses ambulance services (7, 8).

Health-related quality of life (HRQoL) is considered a fundamental assessment of health among healthy individuals and individuals with chronic illnesses (9). Higher level of HRQoL was found to be significantly associated with better physical activity level among adults (10). Sedentary life style and decreased level of physical activity during curfew and lockdown related to COVID-19 might contribute to decreased quality of life among different population (3, 11). Studies have documented drop in quality of life and escalation in mental health symptoms during natural disasters (such as earthquakes), wars, and health pandemic (12).

Adults with visual diseases were reported to have a decline in their HRQoL and daily life functional abilities (13, 14). Previous studies also reported that individuals' with visual diseases are susceptible to increased levels of mental health symptoms including depression, anxiety and stress (15–18). An interesting study by Knudtson, et al. in 2005 suggested that individuals with decreased visual function due to age-related eye diseases are usually suffering from decreased quality of life and functional abilities in daily activities(19).

Individuals with chronic visual diseases require regular follow-up and adherence with their eyecare provider instructions to reduce the potential complications and visual deterioration (20). For example, diabetes-related visual loss is believed to be in part preventable through early detection, regular follow up and timely treatment (21, 22). Even during normal situations out of pandemics and lockdowns, the adherence with ophthalmologic follow-up care was not found optimal among many vision patients. (23–25). Lack of adherence with eyecare follow-up might lead to vision deterioration, which is usually associated with decreased levels of HRQoL and increased levels of mental health symptoms (13, 14).

Given the obvious importance of adherence to ophthalmic regular follow-up, lockdown could have imposed a risk on ophthalmic patients. Recent studies in 2020 suggested that COVID-19 pandemic appears to have serious negative impacts on the mental health and HRQoL levels of various populations (26–28). However, most recent COVID-19 studies have focused on those infected or suspected to have COVID-19 infections. To our knowledge, there is no studies evaluating the impact of the limited access to ophthalmic care during COVID-19 pandemic lockdown on HRQoL and mental health of people with chronic non-urgent ophthalmic conditions requiring regular follow up.

This project aimed to investigate the level of HRQoL among adult individuals with chronic, non-urgent vision diseases in Jordan during COVID-19 lockdown and the associated limited access to ophthalmic care. Predictors of HRQoL in the study population were also determined. Results of this study might help in better ophthalmic services planning for individuals who need regular follow-up during future similar future pandemics and emergencies.

Methods

Design and Sample

The study implemented a cross-sectional design using a self-administered questionnaire. The study aimed to recruit a sample of adults (18–85 years old) Jordanians with vision diseases diagnosed by an ophthalmologist, required follow up, being non urgent and non-emergent, and who visited an ophthalmologist at least one time prior to COVID-19.

According to G-power software, for an average of 15 predictors, a minimum sample of 139 participants was required to generate 80% statistical power (29). A sample of convenience representing all Jordanian main health sectors providing ophthalmic care (Jordanian Ministry of Health, Jordanian Army Royal Medical Services, universities educational hospitals, and the private sector) was recruited. Individuals were contacted using phone calls and SMS messages by their primary eyecare providers. Inclusion criteria included being a male or female between 18–85 years old, living in Jordan for the past one year, having a diagnosis of a chronic, non-urgent eye condition requiring regular follow up documented by a physician, and having a visit to an ophthalmologist within the past one year. Individuals with any visual disease were allowed to participate such as those with diabetic retinopathies, glaucoma, cataracts, and corneal diseases. Individuals with full blindness in both eyes (No light perception), diagnosed with a mental health disease (confirmed by a physician), or with sever motor disabilities (unable to ambulate independently) were excluded from the study.

Data and Outcome Measures:

The study used an Arabic, anonymous, self-administered, web-based survey utilizing Google forms. All of study data were de-identified, kept in an encrypted file on a computer provided by strict security, and only the study principal investigator had access to study data.

The survey included the consent form, demographics, and medical history information. Additionally, the survey collected data related to how participants managed their ophthalmic medical needs such as medications and medical consultations during COVID-19.

The survey also included the *Medical Outcomes Study Short Form (SF-12)* to assess the level of HRQoL. The measure is valid and reliable for individuals with visual impairments and has a total score (SF-12 total, a physical component score (PCS), and a mental component score (MCS). A higher score in SF-12 indicates a better HRQoL level (30–32).

Participants general visual ability was assessed using the *General Vision* subscale of the *National Eye Institute Visual Functioning Questionnaire (VFQ-25)* which is a self-administered scale where patients rate their visual function (wearing their habitual visual aids as needed) from 0 to 10, where zero means the worst possible eyesight, as bad or worse than being blind, and 10 means the best possible eyesight. Furthermore, the *Role Limitation* subscale of VFQ-25 was used as participants were asked “Do you have more help from others because of your vision?” and the responses choices were all, most, some, a little, or none of the time. The VFQ-25 is considered valid and reliable measure of visual abilities for Arabic speaking populations(33, 34).

Depression Anxiety Stress Scale (DASS) was used to assess mental health symptoms. DASS has three subscales assessing depression, anxiety, and stress symptoms and is considered valid and reliable. A higher DASS score indicates a greater extent of mental health symptoms. A cut-off point 10 for depression, 8 for anxiety, and 15 for stress suggest presences of the corresponding mental health symptoms (35, 36).

The initial version of the questionnaire was reviewed by an expert panel and tested in a pilot study of 5 individuals with ophthalmic diagnoses for clarity. All of the pilot participants reported that the survey was clear and easy to follow.

Procedures:

Data was collected between April 18th (one month after full lockdown) and May 4th 2020 before the end of the lockdown. The survey was uploaded online using Google forms. Possible participants were contacted by ophthalmology services participated in the study based on their diagnoses and following regulatory ethics rules in communication. Individuals interested to participate were informed about the study procedures and aims and had to sign an electronic consent form approved by Jordan University of Science and Technology (JUST) Institutional Review Board (IRB), approval # 127/132/2020. Ophthalmic patients interested in the study were allowed to get the help of their family members to read and fill the electronic survey as needed. The survey required an average time of 10 minutes to be filled out.

Statistical Analyses:

Study variables were descriptively displayed using mean/ standard deviation or frequency/ proportion. Correlations between collected study variables and HRQoL measured by SF-12 total scores were conducted. A variables was included in the regression analysis when its correlation with SF-12 total scores p -value was < 0.15 (37). Variables significantly predicted HRQoL were identified using a multiple linear regression with a stepwise feature. A p -value < 0.05 was considered significant in all of the statistical analyses. Data was analyzed using IBM SPSS statistics version 23 (SPSS, Inc., Chicago, IL, USA).

Results

Participants' Demographics:

A total of 201 participants completed the study with age range of 19–80 years and 63.1% were males. Diabetic retinopathy and glaucoma were the most reported visual conditions with prevalence of 25.6% and 21.7% respectively. 71.4% of study participants complained of an eye condition affecting both eyes with a chronicity mean of 5.52 years. 51.2% of participants reported being diagnosed with diabetes. Participants reported an average of 5.38 (± 3.92) visits/year for ophthalmology clinics, and 92.6% of them believed that these visits improve their visual health. Based on the VFQ-25, participants vision self-evaluation (*General Vision* subscale) mean score was 5.32 (± 2.76) and based on Role *Limitation*

subscale 55.2% of them tended to ask for help (from family/friends) in their daily life due to their vision conditions. Table 1 shows an overview of general demographics of study participants.

Table 1
Participants' Characteristics.

Characteristic		Mean (SD) or n (%)
Age (years)		52.09 (15.41)
Gender:	Male	128 (63.1%)
	Female	75 (36.9%)
Marital status	Single	35 (17.2%)
	Married	168 (82.8%)
Working status before COVID-19	No due to Vision	29 (14.3%)
	Retired	100 (14.3%)
	Yes	74 (14.3%)
Chronicity of vision condition (Y)		5.52 (3.74)
Affected eye	One eye	58 (28.6%)
	Two eyes	145 (71.4%)
Main eye condition	Diabetic retinopathy	52 (25.6%)
	Other retinal disease	22 (10.8%)
	Glaucoma	44 (21.7%)
	Eye sensitivity	16 (7.9%)
	Retinal detachments and holes	13 (6.4%)
	Cataract	21 (10.3%)
	Corneal diseases and inflammations	7 (3.4%)
	Other diseases	28 (13.9%)
Diabetes	No	99 (48.8%)
	Yes	104 (51.2%)
Frequency of ophthalmologist visits/year prior to COVID-19		5.38 (3.92)
Ophthalmologist visit improves eyes health*	Strongly disagree	0 (0%)
	Disagree	6 (3%)
N: number, SD: Standard Deviation, VFQ-25: The National Eye Institute Visual Functioning Questionnaire.		

Characteristic		Mean (SD) or n (%)
	Neutral	9 (4.4%)
	Agree	65 (31.5%)
	Strongly agree	124 (61.1%)
<i>VFQ-25: General Vision subscale</i> (1–10)		5.32 (2.76)
<i>VFQ-25: Role Limitation subscale</i>	Never	91 (44.8%)
	Sometime	92 (45.3%)
	Always	20 (9.9%)
N: number, SD: Standard Deviation, VFQ-25: The National Eye Institute Visual Functioning Questionnaire.		

More than half of the participants (54.2%) reported that they needed follow-up in an ophthalmology clinic during the lockdown. However, only 18.2% of all participants have made it to the ophthalmology clinics during lockdown. The majority (73.4%) of participants reported that it was difficult to reach hospitals and get medications during the lockdown and 56.2% reported a cancelation of an ophthalmology appointment or procedure due to the lockdown. However, the majority of participants (67%) reported not noticing any change on their visual symptoms during the lockdown. Table 2 shows participants' reported effects of COVID-19 lockdown on their ophthalmic follow-ups.

Table 2
Effects of COVID-19 lockdown on participants' follow-up with ophthalmologist.

Characteristic		n (%)
Needed ophthalmologist consultation during lockdown	Yes	110 (54.2%)
	No	93 (45.8%)
Visited or contacted ophthalmologist during lockdown	Clinical visit	37 (18.2%)
	Call or social media	42 (20.7%)
	No	124 (61.1%)
Visual symptoms change during lockdown	Deteriorated	52 (25.6%)
	No change	136 (67%)
	Improved	15 (7.4%)
Difficulty reaching hospitals/ medications during lockdown	Strongly disagree	7 (3.4%)
	Disagree	14 (6.9%)
	Neutral	33 (16.3%)
	Agree	55 (27.1%)
	Strongly agree	94 (46.3%)
Ophthalmologist appointment/ procedure cancellation during lockdown	No	89 (43.8%)
	Yes	114 (56.2%)
n: number.		

Participants' health characteristics:

Participants' level of HRQoL (measured by SF-12) was relatively low during the lockdown as the mean score of SF-12 total was 57.90 (± 20.53). Mental health symptoms (of mild or greater severity) were found in 45.8% of participants for depression, 37.9% for anxiety, and 33.0% for stress. The overall DASS mean scores suggested a mild depression (9.90 ± 9.7), mild anxiety (7.40 ± 8.42), and normal stress (11.31 ± 9.60) symptoms levels. Table 3 lists participants' health characteristics during COVID-19 lockdown.

Table 3
Health characteristic of participants.

Characteristic	Mean (SD)
Depression (<i>DASS</i>)	9.90 (9.75)
Anxiety (<i>DASS</i>)	7.40 (8.42)
Stress (<i>DASS</i>)	11.31 (9.60)
Physical Component score (<i>SF-12</i>)	58.15 (21.42)
Mental Component scores (<i>SF-12</i>)	57.48 (19.96)
<i>SF-12</i> Total score	57.90 (18.15)
DASS: Depression Anxiety Stress Scale, SF-12: 12-item Short-Form Health Survey.	

Predictors of HRQoL during COVID-19 lockdown:

The study regression model explained 47.1% of the variance in HRQoL through the variance in its significant predictors ($r^2 = 0.471$, $F = 35.57$, $P < 0.001$). Significant predictors of lower HRQoL level (measured by SF-12) included having diabetes ($\beta = -6.90$ [95% CI -10.99 to -2.81], $P = 0.001$), stress symptoms ($\beta = -0.68$ [95% CI -0.90 to -0.45], $P < 0.001$), the need of an ophthalmologist during COVID-19 ($\beta = -4.88$ [95% CI -9.12 to -0.64], $P = 0.025$), and asking for help from others (*Role Limitation* subscale) due to the vision condition ($\beta = -9.16$ [95% CI -12.54 to -5.78], $P < 0.001$). Table 4 below demonstrates HRQoL significant predictors and their coefficients.

Table 4
Multivariable regression analysis associated factors with health-related quality of life measured by SF-12 survey total score.

Factor	β coefficient	95% Confidence interval		P- value
<i>VFQ-25: Role Limitation</i> subscale	-9.16	-12.54	-5.78	< 0.001
Diabetes	-6.90	-10.99	-2.81	0.001
Needed an ophthalmologist during COVID-19 lockdown	-4.88	-9.12	-0.64	0.025
Stress (<i>DASS</i>)	-0.68	-0.90	-0.45	< 0.001
SF-12: 12-item Short-Form Health Survey, VFQ-25: The National Eye Institute Visual Functioning Questionnaire, DASS: Depression Anxiety Stress Scale.				

Discussion

The main goal of this study was to evaluate the level of HRQoL among Jordanians with visual conditions who require regular follow up and to identify its predictors. Study participants demonstrated a relatively low level of HRQoL which was significantly predicted by the frequency of asking help from others due to vision conditions (*Role Limitation* subscale), being diagnosed with diabetes, the need of an ophthalmologist during COVID-19 lockdown, and stress level. Study findings help improving our understanding of individuals with visual conditions complaints during COVID-19 and in better planning for optimum ophthalmic care in future emergencies.

Level of HRQoL was never studied among Jordanians with visual deficits. However, this study participants' HRQoL during the lockdown mean score of 57.9 is considered relatively poor compared to the general adult population around the world (38–41). Previous studies documented that individuals with visual deficits, particularly if bilateral (such as the majority of our participants) and of progressive age-related changes have demonstrated low levels of HRQoL (42–45).

Based on the International Classification of Functioning, Disability and Health (ICF), the health of individuals with visual deficits should be comprehensively managed considering functioning, participation, and environmental factors(46, 47). The level of HRQoL in this study was significantly and negatively associated with frequency of asking for help from others (*Role Limitation* subscale) due vision condition. The literature has heavily documented such associations between visual disorders and deterioration in functional abilities (44, 45, 48, 49). However, with proper ophthalmic interventions and follow-up, the level of HRQoL and visual function tended to improve in a wide variety of individuals with visual impairments (44, 50). Furthermore, it was not surprising to find the presence of diabetes as a predictor of HRQoL among our participants as diabetes was strongly linked with visual health deterioration in the literature (45).

This study also demonstrated a high level of mental health symptoms (depression, anxiety, and stress) among participants during COVID- lockdown. Previous studies reported that visual impairments are frequently accompanied with increased levels of mental health symptoms such as depression and stress (49, 51, 52). Stress was identified as a significant negative predictor of HRQoL in this current study. Interestingly, it is speculated that stress can be not only a consequence of visual deficit, but also an aggravating factor as continuous stress and elevated cortisol levels might negatively impact the visual system due to sympathetic imbalance and vascular dysregulation (49, 53).

One unique finding in this study, and probably the most important, is having the perceived need to follow-up with an ophthalmologist during COVID-19 lockdown as a significant negative predictor of participants' HRQoL. Even in normal situations out of health pandemics and its associated lockdowns, many vision patients tend not comply with their ophthalmic follow-up appointments which might negatively impact their vision health (23–25). Although following up with an ophthalmologists is highly recommended in the literature(54), this was not easy for the majority of this study participants during the lockdown. The majority of this study participants believed that visiting an ophthalmologist improves their visual health. However, during the lockdown, the majority of them reported it was difficult to reach medical facilities,

more than half of them reported that they needed to consult with an ophthalmologist, more than half of them got an ophthalmology appointment or procedure cancelation, and only 18.2% of them made it to an ophthalmology clinic. These findings make it not unexpected to have the patients' perceived need of a consultation with an ophthalmologist as a significant negative predictor of HRQoL among individuals with visual conditions while the access of such services was limited. Healthcare policy makers and facilities administrators should carefully plan their services during future similar crises to avoid any potential adverse consequences of ophthalmic services discontinuation.

Limitations And Future Directions

The first limitation of this study is that we have no similar data out of the lockdown period. Consequently, we can not do any comparisons or claim that we have studied the effects of lockdown on our participants' HRQoL. Adopting an online survey was another limitation of this study as it could have limited its generalizability. However, during COVID-19 lockdown, an online survey was the only feasible method to reach the targeted population. Furthermore, participants with reading difficulties or low internet and technology related skills were allowed to get help from their caregivers in filling the survey out. Another limitation is due to the short duration of lockdown; collection of longitudinal data was not feasible. Future studies are encouraged to design effective interventions to enhance individuals with visual conditions quality of life and wellbeing in normal and extraordinary circumstances that might limit the access to necessary ophthalmic care such as in health pandemics and other types of crises and emergencies.

Conclusions

Jordanians with visual conditions who required follow up with an eyecare provider faced a very limited access to ophthalmologic services and demonstrated low level of HRQoL during COVID-19 lockdown. This level of HRQoL was significantly and negatively predicted by the frequency of asking for help from others due to vision (*Role Limitation*), being diagnosed with diabetes, the perceived need of follow-up with an ophthalmologist, and stress level. The study also found a high level of mental health symptoms among the participants during the lockdown. Future studies are encouraged to assess HRQoL among individuals with visual conditions using longitudinal designs to reveal the progressive nature of this level and its predictors. COVID – 19 pandemic is an ongoing crisis, consequently, healthcare administrators and policymakers are advised to facilitate the access to ophthalmic services for those in need to prevent adverse effects on vision as well as HRQoL and wellbeing.

Declarations

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Conflicts of interest/Competing interests:

The authors declare that they have no conflict of interest.

Authors' contributions:

All authors significantly contributed to the study conception and design, data collection, analyses, and manuscript writing. All authors read and approved the final manuscript.

Ethics approval:

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee at Jordan University of Science and Technology, IRB approval number: 127/132/2020.

Consent to participate:

Informed consent was obtained from all individual participants included in the study.

Consent for publication:

Informed consent was obtained from all individual participants included in the study. The manuscript does not include any identifying figures or data.

Availability of data and material:

Manuscript data is available upon reasonable request sent to the corresponding author.

Code availability:

NA.

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