Determinants of Overall Quality of Life in Patients with Multiple Sclerosis: PLS-MGA Evidence from Kuwait

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Abstract

Purpose – This paper aims to identify the determinants of overall quality of life (QoL) in PwMS and explore whether there was any significant difference between the path coefficients for males and females.

Design/methodology/approach – Data were collected by distributing questionnaires to 230 PwMS receiving healthcare services in Bin-Sina and Al-Ameri hospitals in Kuwait. The data were analyzed using partial least squares structural equation modeling (PLS-SEM) and multi-group analysis (MGA) in SmartPLS 3.0 software.

Results – The study's findings demonstrate a positive and significant relation between psychosocial support services and the overall QoL for male PwMS. Additionally, the results of the MGA indicate that the effect of psychosocial support services on overall QoL is stronger for male PwMS than their female counterparts. Psychological resilience is a particularly influential factor in the overall QoL of both male and female groups. Furthermore, the MGA results suggest no significant differences in the relationship between psychological resilience and overall QoL across both groups.

Originality/value – Although several scholars discuss the factors influencing overall QoL, This study is among the first few in the Arab world that have systematically evaluated the effect of psychosocial support services and psychological resilience on the overall QoL in PwMS. In addition, so far, no studies have effectively made a comparative analysis across genders, i.e., psychosocial support services and psychological resilience are personal factors in the determinants of overall QoL significantly different across genders.

Keywords: *Overall QoL, psychosocial support services, psychological resilience, Male, Female, Kuwait, PLS, Comparative analysis, MS.*

Introduction

Multiple Sclerosis (MS) is a chronic inflammatory disease that significantly impacts not only both individuals' personal and social lives but also their overall quality of life (QoL) (Delaney & Donovan, 2017; Huang et al., 2017; Tauil et al., 2018). The prevalence rates of MS globally were 2,221,188 prevalent cases diagnosed in 2016, with higher rates in the developed countries, which corresponded to a 10.4% (9.1 to 11.8) rise in the age-standardized prevalence compared to 1990 (Wallin et al., 2019). In Kuwait, there has

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been a noticeable escalation in both the prevalence and incidence rates of MS over the past five years. It has been observed that the MS prevalence in Kuwait has surged by a rate of 1.6, with a current rate of 6.4 cases per 100,000 compared to the previously reported rate. Considering the Kuwait increase in the prevalence of MS, understanding its impact on the QoL of patients with MS (PwMS) has become increasingly important.

Previous studies suggest that PwMS commonly report experiencing higher levels of diminished QoL, compared to patients diagnosed with other diagnosed with other chronic diseases (Campbell et al., 2014; Feinstein, 2002; Oke et al., 2022; Ali et al., 2020; Singh et al., 2019; Oke et al., 2023; Abdullah et al., 2022; Augustine Bala et al., 2022). Moreover, PwMS is also more likely to report higher levels of poor sleep quality and reduced immune functioning (Motolese et al., 2020; Pandian et al., 2021; Nalah et al., 2021; Azman et al., 2019; Jamir Singh et al., 2023; Oke et al., 2023), depression, and other health-related issues (Alqwaifly et al., 2020; Oke et al., 2023; Rashid et al., 2023). Various studies exploring the underlying factors associated with QoL of PwMS issues have suggested several possible predictors for psychosocial support services and psychological resilience (Froehlich-Grobe et al., 2016; Stojanov et al., 2020; Oke et al., 2023; Chai et al., 2022; Abdul Rahman et al., 2022; Yusuf et al., 2021; Vadevelu et al., 2019). Several studies have suggested that promoting resilience in the shifting between illness and wellness contributes to higher QoL of PwMS (Fayand et al., 2019; Ramírez-Maestre et al., 2014). Various studies have also highlighted the importance of these PwMS-centered variables acting as protective factors or resources that maintain and enhance QoL (Fayand et al., 2019; Costa et al., 2012).

Although there is a degree of consensus in the literature indicating that certain factors can be considered significant predictors of QoL issues in PwMS, a challenge arises when comparing the results of these studies due to the inconsistency of the variables included (Abdullah & Bader, 2018; Alshubaili et al., 2007; Alshubaili et al., 2008). Despite the potential impact of such analyses in assessing QoL where several variables are likely to contribute to QoL issues, there are very few studies that have examined the effects of multiple variables of psychosocial support services and resilience in PwMS. Additionally, there is a lack of existing research conducted in the Middle East region that has collectively explored a multitude of variables in the same study, despite research highlighting its implications.

Furthermore, only a handful of studies have analyzed the differences based on gender associated with QoL (Farran et al., 2016; Kołtuniuk et al., 2021). There remains a gender gap in Kuwait PwMS QoL regarding whether these differences are statistically significant. Upon analysis of the data, it was found that female patients with MS accounted for 66.8% of the total, with a female-to-male ratio of 2.01:1 as per the gender variable (Alroughani et al., 2019). An increase in the MS in the female population compared to that of the male population in Kuwait in recent years strengthens the need to investigate the difference between males and females regarding QoL so that policymakers can create a different strategy to ensure adequate treatment plans for each patient group.

This investigation will make a specific contribution by comparing males and females employing PLS-MGA parametric procedures within the PLS path analysis model, which can address this issue in terms of (parameters - path coefficients). Cheah et al. (2020) consider PLS-MGA more appropriate for investigating and contrasting the differences between males and females. The remainder of this manuscript is organized as follows: the subsequent section initiates with a theoretical foundation and hypotheses development, followed by the methodology. The following sections discuss the PLS-SEM approach analysis and the study's findings. The final section presents the implications, limitations of the study, and conclusion.

Literature and hypotheses

Psychosocial Support Services and Overall QoL

Psychosocial support services such as patient education, support groups, and cognitive-behavioral therapies, services can be provided by a neurologist or nurse with specialized education and interest in managing all patients with MS (Sorensen et al., 2019). The objective of psychosocial services is to aid individuals in managing the psychological, social, and emotional challenges that impede their overall health-related quality of life, particularly in the case of individuals with PwMS (Malcomson et al., 2007). Prior research has demonstrated that psychosocial support services (such as assessing, advising, agreeing, assisting, and arranging) are linked to physical, mental, and QoL among individuals with PwMS (Albuquerque et al., 2015; Estevo Dias & Santos, 2020). Providing psychosocial services, such as assisting patients in becoming more engaged in their healthcare, coordinating care, and facilitating medication therapies, is pivotal in comprehending PwMS's health behavior, overall well-being, and QoL (Schriefer et al., 2020). In addition, arranging access to healthcare and receiving sufficient social care services significantly impact QoL in PwMS (Estevo Dias & Santos, 2020). Moreover, advising on MS and its available resources is of utmost importance in facilitating the attainment of QoL in individuals with MS (Alharbi, 2021).

H1. Psychosocial support services have a positive effect on overall HRQoL.

Psychological Resilience and Overall QoL

PwMS with elevated resilience are more likely to employ problem-solving strategies and emotional coping strategies exhibit increased overall QoL (Fayand et al., 2019). Psychological resilience enhances the probability of experiencing a higher QoL among PwMS. As a result, the level of resiliency serves as a more dependable predictor of overall RQoL compared to the disability itself (Dymecka & Gerymski, 2020; Ramírez-Maestre et al., 2014). A thorough examination of the existing literature reveals that the possession of traits associated with psychological resilience can facilitate MS patients' ability to adjust to the condition, resulting in positive outcomes such as enhanced overall QoL (Kasser & Zia, 2020; Mikaeili et al., 2012). Furthermore, it is widely recognized that psychological resiliency exhibits greater predictive power concerning QoL than the disability itself in individuals living with MS. Additionally, resilience has been shown to exert a positive influence on the physical health of PwMS, thereby contributing to an overall improvement in their QoL (Mikaeili et al., 2012; Nakazawa et al., 2018). Therefore, the following hypotheses are developed:

H2. Psychological resilience has a positive effect on overall QoL.

Gender Difference Analysis

Gender is found to develop different perceptions about QoL, and it will influence the mental well-being of PwMS (Casetta et al., 2009). This shows that if there are individual differences in terms of gender, then their perceptions about psychosocial support services and psychological resilience would also be different, and this will affect the overall QoL of PwMS. Furthermore, it was observed that the overall QoL among male patients exhibited a significant increase in comparison to those of female patients, indicating that gender discrimination may have a stronger impact on the HRQoL of males in contrast to females (Aldhahi et al., 2021). Regarding chronic diseases, Gebremichae et al. (2018)argued that the overall male and female populations have different drivers for HRQoL. Alqwaifly et al. (2020) and Timkova et al. (2021) have suggested the importance of psychological well-being in determining the QoL among patients with MS concerning gender. Alqwaifly et al.(2020) investigated the QoL in patients with MS and found that both female and male PwMS have equal inclinations towards QoL. Neto et al. (2019) demonstrated that males have lower overall HRQoL than females, particularly in physical functioning, social functioning, emotional well-being mental health, and sexual

functioning. Female MS patients also experience self-discovery and can nurture positive views of themselves, to name a few, which helps them build their resiliency. As a result, the effect of psychosocial support services on overall QoL is moderated by gender. This effect is assumed to be stronger for males than females. Furthermore, the effect of psychological resilience is also moderated by gender; this effect is assumed to be stronger for females than males. Following the discussion above, the following hypotheses are developed:

H3. The effect of psychosocial support services on overall QoL will be stronger for male PwMS.

H4. The effect of psychological resilience on overall QoL will be stronger for female PwMS.

Methodology

The target population for this study comprises Kuwait PwMS, who receive healthcare services at Bin-Sina and Al-Ameri hospitals, are at least 21 years of age, and have been diagnosed with MS within the past five years. The PwMS is considered the unit of analysis for this study. Following existing literature, the prevalence of MS in Kuwait has been observed to peak in the age groups of 30-39 and 40-49 for both males and females. Beyond the age of 50, there is a discernible decreasing trend in Kuwait (Alroughani et al., 2019). Data for this study were collected at Ibn-Sina and Al-Ameri hospitals, as these facilities, which operate under the purview of the Kuwait Ministry of Health, have established special clinics for treating PwMS.

Research Instruments

 The present study employed a structured questionnaire consisting of three sections. Two items, that pertained to overall HRQoL, were derived from the Arabic version developed by Ohaeri and Awadalla (2009). In this study, psychosocial support services were defined as those perceived as delivered by healthcare providers who were Multidisciplinary Team members at Bin-Sina and Al-Ameri hospitals. The variable was assessed using the Patient Assessment of Chronic Illness Care-Arabic (PACIC-5As), which initially comprised 26 items distributed across five subscales that reflected various aspects of providing patient-centered care consistent with the chronic care model, namely assess (5 items), advise (5 items), agree (5 items), assist (5 items), and arrange (6 items). These subscales were adapted from Adaptive by AlHarbi et al. (2018) on a 5-point rating scale ranging from 1 (almost never) to 5 (almost always). The present research defines Psychological Resilience (PSR) as the capacity of individuals diagnosed with PwMS to cope effectively with the challenges arising from the illness. The variable of interest is assessed by ten items on a 5-point Likert scale from 0 = (not true at all) to 4 = (true almost all of the time) utilizing the CD-RISC-10 version (Campbell-Sills & Stein, 2007) of the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003).

Data Collection and Sample

Offline and online survey methods were employed to collect data from Kuwaiti PwMS who receive healthcare services at Bin-Sina and Al-Ameri hospitals. Initially, the medical team, which included an MSW, distributed the questionnaires to PwMS in clinics during clinic working hours. Further, researchers resorted to administering the questionnaire via online platforms such as Google Forms and social networking sites like Email and WhatsApp. The targeted sampling method was utilized to gather samples from male and female PwMS receiving healthcare services at Bin-Sina and Al-Ameri hospitals. PwMS recruitment was conducted voluntarily, whereby the purpose of the study was declared during patients' waiting hours at the clinic. Subsequently, PwMS listed in the database were contacted and informed of the study's purpose before being invited to participate.

Table I presents the sample characteristics of the respondents, where 62.6% were females and 37.4% were males. The age distribution of the respondents was as follows: 66.5% were between the ages of 21 and 30, 58% were married, 62% were employees, and 66% had been diagnosed with MS within the past five years.

Table 1: Characteristics of the sample

Variable	Description	No. of Respondents	Percentage (%)
Gender	Male	86	37.4
	Female	144	62.4
Age (years)	21-30 years	153	66.5
	31-40 years	18	7.8
	41-50 years	26	11.3
	More than 50 years	33	14.3
Social status	Single	64	27.8
	Married	134	58.3
	Divorced	29	12.6
	Widowed	3	1.3
Occupation	Not working/housewife	38	16.5
	Student	14	6.1
	Employee	144	62.6
	Freelance Business	13	5.7
	Retired	19	8.3
	Employee and student	1	0.4
	Media	1	0.4
How long have you been diagnosed with MS?	Less than five years	153	66.5
	5-10 years	18	7.8
	11-15 years	26	11.3
	More than 15 years	33	14.3

Data Analysis

 To determine the efficacy of this study's analysis, GPower was utilized to calculate the requisite sample size, which was determined to be a minimum of 73 cases. The study had a sample size of 144 females and 86 males, exceeding the minimum sample size and achieving a power of 0.90. The data analysis method employed was the SEM-PLS approach utilizing the SmartPLS version 3.3.3, which consisted of various stages. Firstly, the measurement model was assessed to evaluate construct validity and reliability. Secondly, the structural model was evaluated to examine the direct relationship between exogenous and endogenous variables. Thirdly, MGA to examine whether there was any significant difference between the male and female path coefficients. PLS is considered a

more appropriate method for conducting an MGA between genders, as it does not require an equal number of sample groups, as noted by Matthews (2017). PLS-based MGA is recommended for evaluating data groups, such as gender, that exhibit significant variances in their group-specific parameter estimations (Cheah et al., 2020). The data sets were divided into two categories, specifically female (252 samples) and male (86 samples), to facilitate the application of MGA. Moreover, all essential criteria proposed by Hair et al. (2017), including convergent validity, discriminant validity, and measurement invariance, were assessed.

Results

Measurement Model Results

The present study conducted a construct validity namely convergent validity and discriminant validity, as suggested by Hair et al. (2017). The findings of the convergent validity assessment are presented in Table 2, which displays that each item has factor loadings of over 0.50, and the average variance extracted (AVE) for each construct is 0.50 or higher (Hair et al., 2017). Seven items of AGR1, AST1, AST5, ASE1, ASE5, ARR2, and ARR3, PACIC were removed from the assessment since they had an AVE lesser than 0.50 (Hair et al., 2017). Similarly, three items of PSR, namely PSR3, PSR8, and PSR10, were also deleted from the assessment due to AVE values lower than 0.50. Therefore, the AVE outcomes for every construct met the expected level of >0.5, indicating a satisfactory result. As presented in Table 2, composite reliability was checked before performing the validity analysis, and the range from 0.881 to 0.887 can be regarded as satisfactory in both groups.

Table 2: Results of the measurement model

Construct		Full sample (230)			Female sample (144)			Male sample (86)		
		Loading	CR	AVE	Loading	CR	AVE	Loading	CR	AVE
PACIC	ADV1	0.705	0.956	0.534	0.682	0.959	0.552	0.719	0.95	0.502
	ADV2	0.790			0.819			0.758		
	ADV3	0.740			0.763			0.675		
	ADV4	0.568			0.509			0.678		
	ADV5	0.723			0.768			0.672		
	AGR2	0.631			0.545			0.737		
	AGR3	0.795			0.794			0.763		
	AGR4	0.772			0.775			0.765		
	AGR5	0.743			0.786			0.671		
	ARR1	0.750			0.767			0.730		
	ARR4	0.767			0.807			0.693		
	ARR5	0.773			0.784			0.742		
	ARR6	0.723			0.758			0.685		
	ASE2	0.694			0.698			0.684		
	ASE3	0.743			0.786			0.661		
	ASE4	0.674			0.691			0.631		
	AST2	0.676			0.712			0.659		

Construct	Item									
	AST3	0.763			0.777			0.733		
	AST4	0.807			0.808			0.782		
Overall QoL	G1	0.875	0.881	0.788	0.885	0.887	0.796	0.848	0.871	0.772
	G2	0.900			0.900	0.895	0.551	0.908		
PSR	PSR1	0.734	0.891	0.539	0.704			0.785	0.881	0.517
	PSR2	0.790			0.791			0.800		
	PSR4	0.731			0.757			0.683		
	PSR5	0.744			0.723			0.783		
	PSR6	0.715			0.710			0.710		
	PSR7	0.735			0.750			0.706		
	PSR9	0.685			0.756			0.529		

The Fornell-Larcker criterion and Heterotrait-monotrait (HTMT) ratio of correlations were employed to establish the discriminant validity. Table 3 presents the square root of each construct's AVE surpasses its highest correlation with any other construct in both groups. Additionally, the findings of the HTMT ratio of correlation in Table 3 indicate that all constructs fall below the established threshold of 0.85, with the highest HTMT value being 0.791 (QoL). This signifies that a latent variable in this study already accounts for the variance of its indicators in a superior manner relative to other latent variables (Hair et al., 2017). Consequently, the measurement model has been successfully validated.

Table3: Discriminant validity of data sets

	Fornell–Larcker criterion			HTMT criterion		
	1	2	3	1	2	3
Discriminant validity (full)						
1.Overall HRQoL	0.887					
2.PACIC	0.298	0.731		0.331		
3.PSR	0.600	0.303	0.734	0.756	0.324	▓
Discriminant validity (Female)						
1.Overall HRQoL	0.892					
2.PACIC	0.240	0.743		0.236		
3.PSR	0.638	0.276	0.742	0.791	0.268	▓
Discriminant validity (Male)						
1. Overall QoL	0.879					
2. PACIC	0.466	0.708		0.521		
3. PSR	0.544	0.432	0.719	0.694	0.472	▓

Assessment of the Structural Model

In testing the structural model, bootstrap was utilized to estimate the structural model with a sample size of 5000 and a significance level of 5%. Before delving into the relationship between the structural model and path coefficients, this study first addresses

the estimation of model fit. One of the critical measures of goodness of fit is the standardized root-mean-square residual (SMSR), computed for both female and male groups in this investigation. The findings demonstrated that SMSR values of 0.07 and 0.08 for females and males, respectively, are deemed acceptable for retaining a good fit of the model because they are equal to or less than 0.08, as Henseler et al. (2014) recommended. As evidenced by the data analysis conducted on the structural model, as illustrated in Figure 1, the R^2 values for Overall QoL were 0.411 for females and 0.361 for males. These values indicate a relatively high-quality level and are considered acceptable within behavioral research standards, as Cohen (1988) outlined.
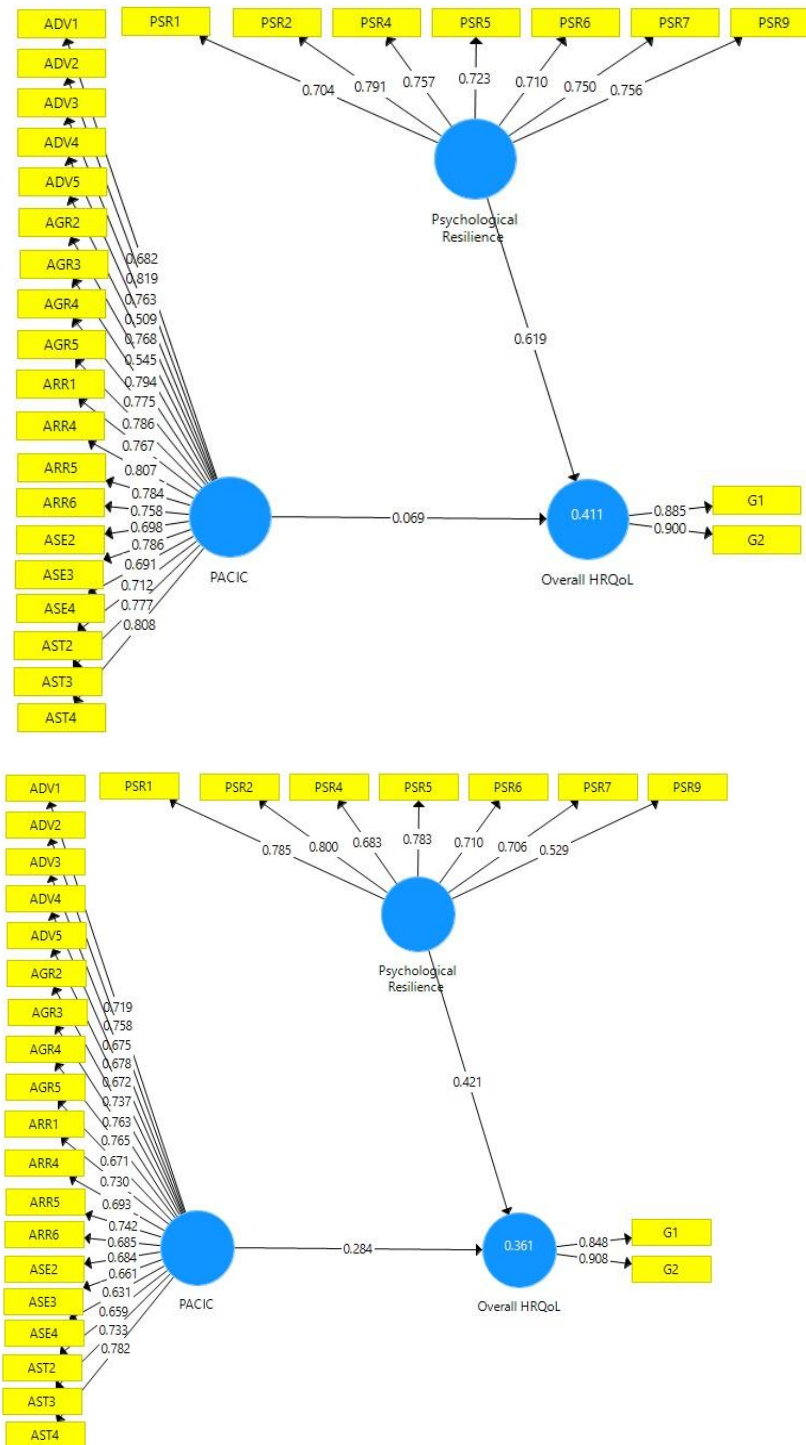
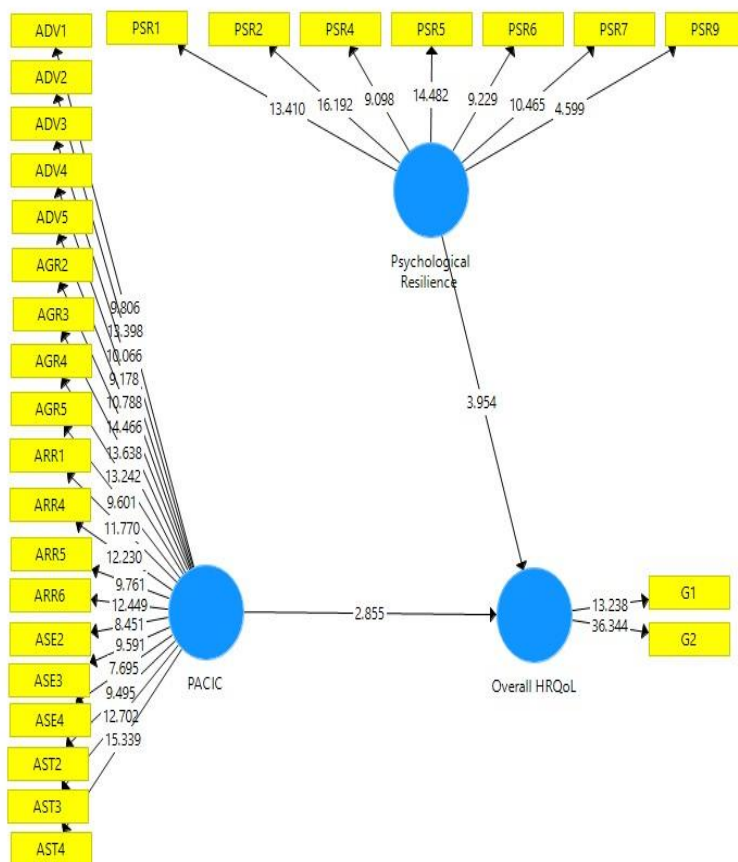Figure 2: Results of a measurement model for females and males

Hypotheses Testing

Table 4 and Figure 2 present the structural coefficient estimates for each model's latent variables. In the female group, the results showed a slight difference, whereby the psychosocial support services (b = 0.069, p > 0.05) exhibited no impact on the overall HRQoL. However, psychological resilience (b = 0.233, p < 0.01) positively and significantly affected the overall HRQoL. On the other hand, in the male group, all hypotheses were supported, and all paths were significant at the 0.01 level. For instance, the results revealed that the psychosocial support services (b = 0.284, p < 0.01) had a positive and significant effect on the overall HRQoL, while the psychological resilience (b = 0.421, p < 0.01) had the highest level of impact on the overall HRQoL. Overall, the findings presented in Table 5 provide empirical evidence in support of the proposed hypotheses (H1 & H2) for the male group. The results show that psychosocial support services and psychological resilience positively affect overall HRQoL.

Table 4: Result for direct relationships for both groups

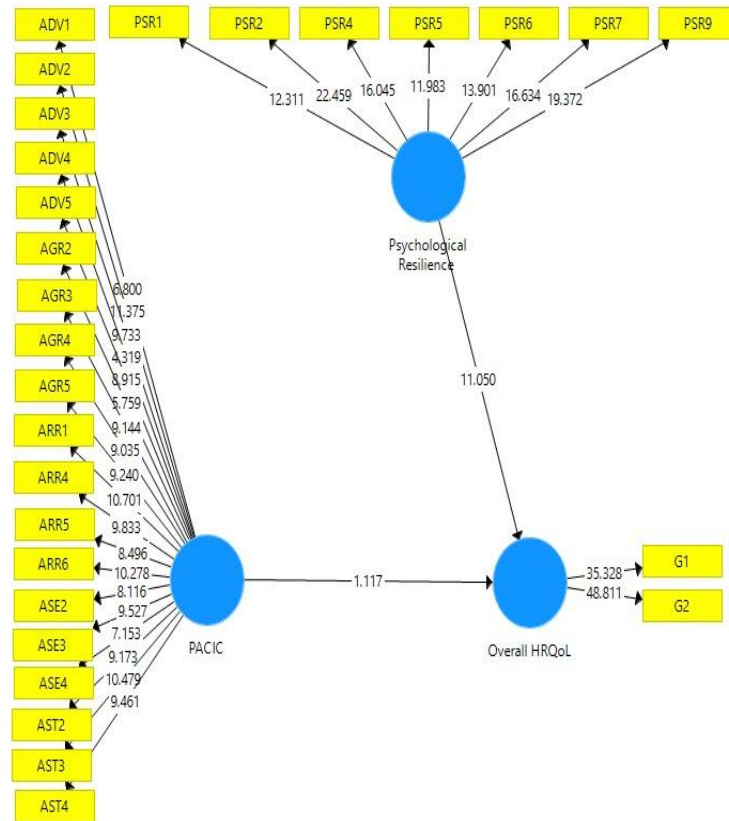|		Female(n=144)			Male(n=86)		
		Standard beta	Standard error	T value	Standard beta	Standard error	T value
H1	Psychosocial support services -> Overall HRQoL	0.069	0.062	1.117	0.284	0.099	2.855**
H2	Psychological resilience -> Overall HRQoL	0.619	0.056	11.05**	0.421	0.106	3.954**

** p < 0.01; *p < 0.05

Figure 2: Figure 2 Results of structure model for female and male group

Multigroup Analysis (MGA)

To perform MGA between two or more groups using Structural Equation Modeling (SEM) analyses, Hair et al. (2017) recommended conducting a measurement invariance test. To compare and evaluate group-specific differences in PLS-SEM results, it is necessary to establish the measurement invariance of composite models (MICOM) of both groups (Matthews, 2017). The MICOM process facilitates the comparison of group parameters and allows the determination of the presence or absence of no, partial, or complete measurement invariance (Henseler et al., 2016). The procedures employed by MICOM encompass a three-step process, which includes the assessment of invariance, compositional invariance, and evaluating equal mean value and variance across different groups. Table 5 illustrates the testing of invariance measurement through permutation for the gender group.

Following the MICOM assessment, the next step is the assessment of differences between the path coefficients for both groups simultaneously for comparison, as Matthews (2017) suggested. The examination of the permutation test also involved the consideration of the p-value. However, differences only arise at the significance level of 5 percent when the p-value is below 0.05. The evaluation of the structural model based on the permutation method is presented in Table 6, revealing a significant difference in the impact of psychosocial support services on the overall HRQoL across both groups (H3). Specifically, the effect of psychosocial support services on overall HRQoL is significantly stronger in male patients with MS than in their female counterparts. In contrast, the effect is weaker for female patients with MS. Furthermore, Table 6 demonstrates no significant distinction between psychological resilience and overall HRQoL across both groups. Thus, no significant difference exists between males and females concerning the impact of psychological resilience on overall HRQoL (H4). Consequently, it can be deduced that the results obtained do not support the hypotheses advanced by this study, including H4, while supported by H3.

Table 5:   Summary of Invariance Measurement Testing Using Permutation Results

Construct	Configurational Invariance (Step 1)	Compositional Invariance (Step 2)			Equal Mean Assessment (Step 3a)			Equal Variance Assessment (Step 3b)			
		Original Correlation	5.0%	Partial Measurement Invariance	Original Differences	Confidence Interval	Equal	Original Differences	Confidence Interval	Equal	Full Measurement Invariance
PACIC	Yes	0.993	0.993	Yes	0.128	[-0.277; 0.270]	Yes	0.086	[-0.239; 0.279]	YES	Yes
PSR	Yes	0.997	0.980	Yes	0.187	[-0.277; 0.270]	Yes	0.073	[-0.364; 0.416]	Yes	Yes
Overall HRQoL	Yes	0.999	0.993	Yes	-0.207	[-0.264; 0.268]	Yes	-0.094	[-0.298; 0.318]	Yes	Yes

Table 6: Results of multigroup analysis hypothesis testing

H.	Relationships	Path Coefficients				Confidence interval (95%)		p-value difference (one-tailed)	
		Female	Male	Path Coefficients Difference		2.50%	97.50%	Permutation Test	Supported
H3	Psychosocial support services -> Overall HRQoL	0.069	0.284	-0.215		-0.213	0.187	0.038*	Yes
H4	Psychological Resilience -> Overall HRQoL	0.619	0.421	0.198		-0.209	0.191	0.053	No

*Notes: In the permutation test, the p-value lower than 0.05 indicates the 5% level significant differences between specific path coefficients across two groups; $p < 0.05$

Discussion

This study is among the first few in the Arab world to examine the relationship between psychosocial support services, psychological resilience, and overall HRQoL in PwMS in Kuwait. Interestingly, the relationship between psychosocial support services and overall HRQoL was significant in male samples (H1). Also, the results imply significant differences between females and males in the relationship between psychosocial support services and overall HRQoL (H3). Similarly, the present discovery suggests that females may have fewer opportunities to avail themselves of psychosocial support services than males. This is because males are more likely to utilize medical and mental health services, while females are more sensitive to symptoms and interested in their health. This observation can be attributed to the limited involvement of female patients in Arab societies in psychosocial support services in MS clinics. It is noteworthy that prior studies have reported affirmative outcomes, linking psychosocial support services to HRQOL among male patients with PwMS (Aldhahi et al., 2021; Gebremichael et al., 2018; Azman et al., 2017; Azman et al., 2020; Azman et al., 2019). Consequently, females may perceive their overall well-being differently and QoL (Sagar et al., 2019; Halim et al., 2020; Azman et al., 2021; Islam et al., 2019; Azman et al., 2020; Rashid et al., 2020; Ali et al., 2020). Dispensing psychosocial support services might result from inadequate representation and reduced significance in the HRQOL in female PwMs. These results are consistent with those of Alagraa et al. (2015), who suggest that healthcare organizations should provide female patients with more psychosocial support for MS females.

Based on the hypothesized relationships between psychological resilience and overall HRQoL in Table 5, female and male samples show that all paths were positive,

significant, and consistent with the theoretical hypothesis (H2). Furthermore, this study's results indicate no significant differences between genders in the relationship between psychological resilience and the overall HRQoL among PwMS (H4). The present finding demonstrates that both male and female individuals with MS exhibit equal tendencies regarding overall HRQoL, consistent with Alqwaifly et al.(2020).

Furthermore, this result follows information from Aldhahi et al. (2021), who showed that the levels of resilience on HRQoL do not differ between genders. t is in line with the previous notion regarding the fact reported by Mohlin et al. (2017), that women have lower levels of psychological resilience associated with all domains of HRQoL compared to normative data reported by Connor and Davidson (2003). Nevertheless, this may reflect the results of Nahum et al. (2022) and Sinvani et al. (2021), who demonstrated that there was an absence of gender disparities detected in psychological resilience, which contributed to the prognostication of the QoL among young adults during a taxing life circumstance. Thus, this study adds to the literature that psychological resilience is a significant driver of overall HRQoL for all PwMS in Kuwait, regardless of gender.

Theoretical Implications

Despite much being conducted about QoL for PwMS, there is little information concerning the relationships among the variables of psychosocial support services, psychological resilience, and overall QoL among PwMS in Kuwait. Hence, the first theoretical contribution of this study is to examine the individual factors in overall QoL for PwMS in a non-Western nation, namely Kuwait, which has a higher incidence of MS and is recognized as one of the countries with a high-risk MS prevalence. This result supports prior research studies emphasizing that psychological resilience is considered one of the key driving elements of overall QoL, which means that the level of PwMS psychological resilience, regardless of gender, positively influences overall QoL. This study has also provided a valuable contribution by examining the path coefficients for the male and female differences. This result gives more robust answers to previous studies; the relationship between psychosocial support services and overall QoL is stronger for female PwMS than for male PwMS. This implies that male individuals with PwMS residing in countries with a high prevalence of multiple sclerosis, such as Kuwait, exhibit a greater awareness of the availability of psychological support services in MS clinics, given the risk and uncertainty associated with their condition. This awareness has a significant impact on the overall QoL of these individuals.

Practical Implications

Before this study, there was a lack or little understanding of the factors influencing the overall QoL for PwMS in Kuwait. Thus, the conclusions of this investigation will serve as a valuable contribution to the government, as it will provide compelling evidence for focusing its efforts on enhancing the provision of psychosocial services and psychological resilience in MS clinics. Moreover, the proposed model developed in this study can offer healthcare providers in the MoH in Kuwait to pay more attention to psychological support services in the MS clinics of PwMS. The inclusion of social support services and the introduction of resilience programs are vital for healthcare providers in hospitals to reduce disease activity. They should be duly considered during strategic decision-making. Hospitals may optimize the overall HRQoL of MS patients by implementing MS clinics characterized by structured health education and rehabilitation programs that employ diverse educational media. This is due to the purported significance of health education and rehabilitation programs within MS clinics. In addition, incorporating comfortable information technology within the psychosocial support services offered by hospitals can potentially enhance the HRQoL of MS patients. MS patients who exhibit greater resilience, as indicated by their personal flexibility, optimism, and self-efficacy under stress, tend to respond better to MS and consequently experience higher levels of HRQoL. Healthcare workers in hospitals may also employ diverse mechanisms and

services to cultivate resilience among MS patients, ultimately enhancing their overall HRQoL.

Regarding resilience and its impact on the overall HRQoL of patients afflicted with MS, health educators must adopt a multi-channel communication strategy encompassing various platforms, including social media. The strategy shall enable programs promoting counseling, prevention interventions, and other related services. Furthermore, to enhance the HRQoL of MS patients, health educators ought to carry out public awareness campaigns both through face-to-face interactions and online engagements. These campaigns should focus on educating individuals on effectively utilizing and availing of psychological support services systems.

Limitations and Direction for Future Research

First and foremost, it is imperative to note that this particular investigation solely examines psychosocial services and psychological resilience, and thus, the discussion of results is limited to a general perspective. Consequently, there is a need for further studies that can concentrate exclusively on other psychological factors. Secondly, it is essential to acknowledge that this study solely focuses on the difference in testing between male and female PwMS without taking into account other variables, including but not limited to optimism, self-efficacy, social integration, fatigue, and loneliness, which may elucidate the differences among Kuwait PwMS. Finally, the model of the study can be replicated in different countries to examine the significant role of resilience because its influence in both male and female PwMS responses regarding the overall HRQoL would enrich the body of knowledge in this area.

Conclusion

This research empirically tests the relationship between the potential psychological factors and the overall HRQoL based on previous research to give insight into the phenomenon of HRQoL, particularly in the Kuwait PwMS context. The key focus of this study is to examine the effect of psychological support services and psychological resilience on overall QoL for both genders to see whether there is any difference between the path coefficients for the male and female PwMS by using MGA in SmartPLS. To be more specific, based on the current data, the study finds that psychological resilience is one of the most significant determiners of the overall QoL of both genders. Furthermore, the results of the PLS-MGA indicate that there is a significant difference between male and female PwMS in terms of the effect of psychological support services on overall QoL; the relationship is significant for a female but not for a male.

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