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Servant leadership, work-life quality, and organizational citizenship behavior in nurses: a cross-sectional design

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Abstract

Background Organizational citizenship behavior and quality of work life of nurses are influential factors in improving health care services provided by nurses. The leadership style of head nurses is a key factor in enhancing nurses' performance. This study aimed to explore the relationship between head nurses' servant leadership style and both the quality of work-life and organizational citizenship behaviors among nursing staff.

Methods This cross-sectional and correlational study encompassed 344 nurses from five hospitals affiliated with Hamadan University of Medical Sciences in Iran. These nurses were chosen through stratified proportional random sampling between December 2021 and April 2022. Data were collected using questionnaires assessing demographics, servant leadership, quality of work-life, and organizational citizenship behaviors. Statistical analysis was performed using SPSS v.20, employing descriptive statistics and inferential methods, specifically independent sample t-test, Pearson correlation coefficient and multiple regression analysis.

Results The majority of nurses indicated a moderate level of quality of work life (64.5%) as well as organizational citizenship behavior (65.4%). The findings demonstrated a strong and statistically significant correlation between servant leadership style and both quality of work-life ($r=0.680$, $p=0.001$) and organizational citizenship behavior ($r=0.727$, $p=0.001$). Furthermore, a positive and moderate to strong correlation was found between organizational citizenship behavior and quality of work-life ($r=0.583$, $p=0.001$). Servant leadership style ($\beta=0.663$, $P<0.001$), quality of working life ($\beta=0.160$, $P=0.001$), gender ($\beta=0.126$, $P=0.011$), and work shift ($\beta=0.112$, $P=0.041$) all positively and significantly influenced nurses' organizational citizenship behavior, accounting for approximately 55% of its variability.

Conclusions This study confirmed the relationship between head nurses' servant leadership style and both quality of nurses' work-life and the organizational citizenship behavior. It is recommended that healthcare system managers prioritize training head nurses in the servant leadership style and encourage them to use this leadership style to enhance the quality of work life and organizational citizenship behavior of nurses.

Keywords Servant leadership, Organizational citizenship behavior, Quality of work-life, Nurses

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Background

As the twenty-first century commenced, the moral nature of leaders has been recognized as vital not only for societal welfare but also for the sustainable success of organizations, indicating a significant transformation in research focus. Consequently, various theories of moral leadership, including transformational, ethical, authentic, and servant leadership, have garnered substantial interest from scholars in recent times [1]. In today's organizations, the most prevalent leadership model is the traditional model of power and authority, which is challenged by servant leadership. Traditional leadership theories have typically been founded on a hierarchical model wherein organizational leaders make decisions from the top down and followers at lower levels must obey them as members of the organization [2]. The theory of servant leadership was initially introduced by Robert Greenleaf in 1977. According to him, leaders in the "inverted pyramid" model—which is regarded as the core of servant leadership—are viewed as servants of their followers, focusing on their needs, growth, and development [2, 3]. Servant leadership fundamentally represents a leadership approach that prioritizes the needs of others above personal interests [4]. Servant leadership places more emphasis on learning-based and democratic leadership than on power-based and hierarchical leadership [5].

The intrinsic characteristics of the healthcare sector provide a conducive environment for the adoption of servant leadership practices within healthcare settings [4]. A prominent leadership style within the nursing profession is servant leadership. The core values of nursing align closely with the principles and characteristics of servant leadership, which encompass altruism, active listening, humility, compassion, empathy, and a commitment to fostering the development and well-being of others [6]. Servant leadership style (SLS) fosters teamwork, community building, collaborative decision-making, ethical behavior, and care that adheres to the standards of the nursing service system, all of which improve organizational effectiveness and staff members' personal development [7].

Focusing on SLS is particularly important as nurses continue to experience high emotional exhaustion, workplace violence, and unfriendly work environments [8]. The nurses quality of work life (QWL) refers to the extent to which registered nurses are able to meet their personal needs through their experiences within the workplace, all while contributing to the objectives of the organization [9, 10]. Brooks et al. (2007) assert that organizations evaluating the quality of nursing work life can gain insights into the effects of work design, workplace conditions, societal influences, and the balance between professional and personal life on nurses. This understanding, in turn, influences overall organizational productivity. Furthermore, by examining the quality of nursing work life, organizations can identify specific aspects that require enhancement [11]. A study in Tabriz, Iran, found that approximately 81.2% of nurses reported a low QWL [12], while another study in Rasht revealed that 55.4% of Iranian nurses had a desirable QWL [13]. The quality of nursing work life is influenced by various factors, including relationships with colleagues, decision-making latitude, leadership styles, demographic characteristics, salary and benefits, shifts, and workload [14]. Through the application of specific leadership styles and behaviors, a leader can influence the QWL experienced by their nursing staff [15].

Servant leaders actively listen to the concerns of their employees in order to identify effective solutions. They address the requests of employees regarding their personal development and overall well-being. As a result, employees feel valued and appreciated through the attentive support of servant leaders [16]. SLS, distinguished by its emphasis on care, ethical conduct, empowerment, personal growth, teamwork principles, and dedication to delivering high-quality service, possesses the capacity to foster a compassionate, positive, and healthy workplace climate [17]. Head nurses who adopt a SLS foster strong relationships with their nursing staff, actively listen to their perspectives, engage them in the decision-making process, and encourage them to take calculated risks for improvement. In doing so, they significantly contribute to nurturing a sense of psychological safety among employees [18]. When servant leaders offer diverse resources and support to assist their employees in managing job demands, it tends to result in higher job satisfaction and improved physical and mental health among employees. Servant leaders are likely to shield their followers from the negative effects of job-related stressors, thereby contributing to enhanced employee well-being [19].

SLS is crucial in nursing, as it enhances motivation to meet organizational standards and engage in organizational citizenship behaviors (OCB) [6]. OCB denotes the collaborative actions of employees that extend beyond their assigned responsibilities. Such actions are undertaken without the anticipation of rewards or advantages, aimed instead at enhancing the overall effectiveness and success of the organization [20]. Servant leaders act as behavioral role models for their subordinates. When nurses observe and adopt the servant leadership qualities of their superiors, they become effective role models themselves [6]. Servant leaders set an example for their employees through integrity, humility, and empathy, which may inspire subordinates to adopt similar behaviors. Nurses are more motivated to engage in OCB when they observe their leaders demonstrating such actions. The dedication of servant leaders to exceed job requirements inspires nurses to actively participate in similar

behaviors [3]. When a servant leader cultivates a strong relationship with employees, it fosters a sense of partnership within the organization. Consequently, this connection strengthens employees' feelings of belonging and identity. Such a sense of identity encourages employees to engage in actions that are advantageous to the organization [21].

Recent studies have uncovered significant connections between SLS with OCB [22–24], and with QWL [25, 26] in non-therapeutic centers. In healthcare setting, some studies have confirmed that SLS significantly impacts OCB [27–30], organizational trust [28], innovative behavior, job performance [31], psychological well-being [19], and emotional exhaustion [6, 8] among nurses. Furthermore, despite limited research concerning the correlation between QWL and OCB in the nursing [32, 33], no studies have been identified that simultaneously explore the three variables of SLS, QWL, and OCB. The study aimed to assess the correlation between head nurses' SLS, QWL, and OCDs among nursing staff. It was hypothesized that in nursing environments where servant leadership predominates, nurses would experience an enhanced QWL and would demonstrate heightened engagement in OCB.

Methods

Study design, sampling and setting

This cross-sectional and correlational study was conducted across five university hospitals. The study population comprised all nurses (1064) employed at these hospitals during the sampling period (December 2021 to April 2022). Through stratified proportional random sampling, 344 nurses were selected from the five hospitals affiliated with Hamadan University of Medical Sciences in Iran (Fig. 1). From the various scenarios generated for Pearson correlation tests and multiple regression analysis using G power v.3.1, a minimum sample size of 320 was determined. To conduct Pearson's correlation tests (Effect size = 0.16, $\alpha = 0.05$), a power of 0.82; and for multiple regression analysis (Effect size = 0.05, $\alpha = 0.05$), a power of 0.81 was achieved. Given an anticipated attrition rate of 10%, the final sample size was determined to be 352. We employed a proportional stratified random sampling method to select nurses, with the sample size determined by the number of nurses employed at each hospital.

Measurements

Demographic data

It included age (years), work experience (years), gender (female/male), marital status (single/married), education level (bachelor's degree/higher), and work schedule (fixed/rotating).

Servant leadership style

The SLS Scale, developed by Gholipour and et al. in 2009, is a self-administered questionnaire. It consists of 28 items distributed on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). These items are categorized into four domains: servanthood (6 items), humility (7 items), trust (10 items), and kindness (5 items). A higher average score implies that nurses perceive their supervisors to exhibit a higher level of servant leadership style. The tool's creators established the content validity and construct validity, and reported an internal consistency of 0.9 [34]. In our study, the components showed Cronbach's alpha coefficient values ranging from 0.741 to 0.917.

Quality of Work-Life

The QWL Scale, developed by Brooks and Anderson in 2005, is a self-report questionnaire with 42 items by five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). These items are categorized into four domains: home life (7 items), work design (10 items), work context (20 items), and work world (5 items). A higher average score implies that nurses perceive of their QWL [35]. Alzamel et al. (2020) reported a Cronbach's alpha of 0.911 for nurses' quality of work life [36]. In present study, reliability ranged 0.837–0.936.

Organizational citizenship behavior

The OCB scale developed by Podsakoff et al. (1990) is a questionnaire consisting of 24 items and encompassing five dimensions: conscientiousness (5 items), politeness (5 items), altruism (5 items), chivalry (5 items), and civic virtue (4 items). The respondents evaluated the items using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A higher average score indicated a higher level of OCB in nurses. In Podsakoff et al.'s study, reliability of components ranged 0.72–0.85 [37]. In present study, reliability ranged 0.802–0.897.

Data collection

To be eligible for the study, participants were required to hold a bachelor's degree or higher in nursing and have a minimum of six months of work experience. Individuals who indicated their unwillingness to participate were not included in the study.

The participants received explicit guidance on how to respond to the inquiries. The average survey time per person was 15–20 min. After completing the survey, the questionnaire was processed and stored securely. Participants were assured that the encrypted data would only be stored on the researcher's computer. It was emphasized that the collected information would not be utilized for any other intentions.

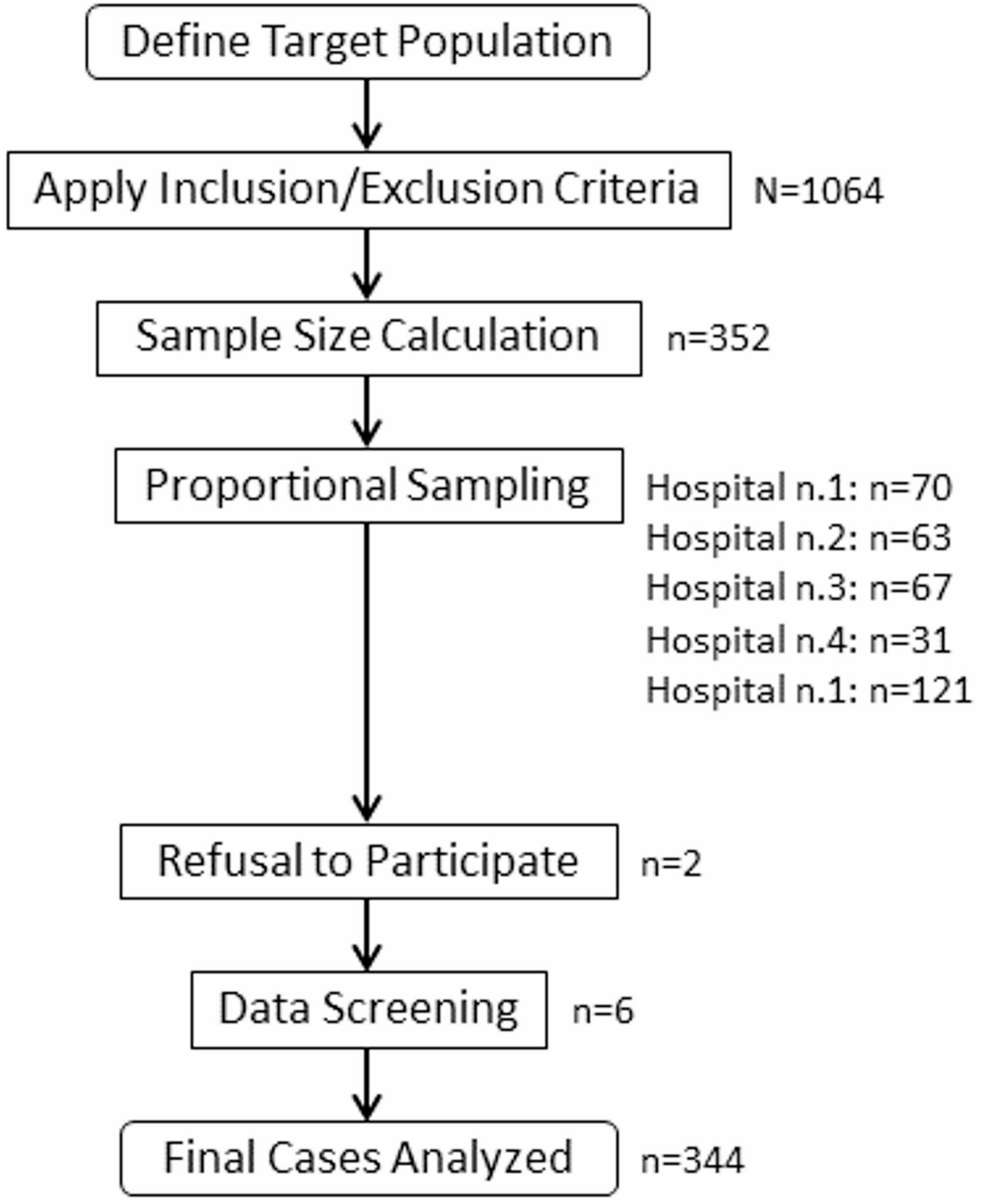

Fig. 1 Sampling process

Table 1 Level of quality of work life and organizational citizenship behavior ($n=344$)

Level of OCB and QWL	QWL		OCB	
	n	%	*N*	%
Low	60	17.5	52	15.1
Moderate	222	64.5	225	65.4
High	62	18	67	19.5
Total	344	100	344	100

Table 2 Differences in quality of work life and organizational citizenship behavior based on demographic characteristics ($n=334$)

Characteristics	*N*(%)	QWL	OCB
		mean (SD)	mean (SD)
Gender			
Female	260 (75.6%)	128.55 (18.90)	72.20 (14.62)
Male	84 (24.4%)	123.69 (20.40)	65.89 (16.40)
		$P=0.045$	$P=0.001$
Marriage			
Single	119 (34.6%)	131.15 (18.75)	72.26 (16.00)
Married	225 (65.4%)	125.36 (19.42)	69.82 (14.87)
		$P=0.008$	$P=0.160$
Education			
Bachelor	303 (88.1%)	127.04 (19.59)	70.55 (15.41)
Higher	41 (11.9%)	129.70 (17.62)	71.51 (14.57)
		$P=0.410$	$P=0.706$
Work Schedule			
Fixed	192 (55.8%)	132.54 (16.33)	75.23 (15.41)
Rotating	152 (44.2%)	120.82 (20.90)	64.89 (15.74)
		$P<0.001$	$P<0.001$

Independent sample t-test

Statistical analysis

To present the demographic data and key parameters, descriptive statistics including frequencies, mean, standard deviation, and range were utilized. To analyze the data, we conducted independent samples t-test, Pearson's correlation, and regression tests using SPSS v.20, with a significance level set at 0.05 for all analyses. Statistical assumptions of all tests including normal distribution of data, homogeneity of variances, relationship between the independent and the dependent variables as well as outliers check were met.

Ethical considerations

Ethical considerations remained a crucial part of the entire study. The code of ethics with the number IR.UMSHA.REC.1398.440 was acquired from Hamadan University of Medical Sciences. Prior to their inclusion in the research, participants were ensured about the confidentiality of their responses and their consent was obtained.

Table 3 Correlation between age, work experience and servant leadership style with quality of work-life and organizational citizenship behavior

Variables	QWL	OCB
Age	-0.118*	-0.124*
Work experience	-0.132*	-0.125*
SLS	0.68***	0.727***
QWL	1	0.583***

*Correlation is significant at less than 0.05 level (2-tailed)

*** Correlation is significant at less than 0.001 level (2-tailed)

Findings

Two nurses declined to participate, and six questionnaires were excluded from the dataset due to incomplete responses and unengaged cases. Eventually, after handling the missing data, 344 questionnaires (response rate: 97.7%) were analyzed. The majority of nurses indicated a moderate level of QWL, with 64.5% falling into this category. Similarly, 65.4% of nurses reported a moderate level of OCB (Table 1).

The participants' baseline demographic characteristics and differences in QWL and OCB by them can be found in Table 2. In evaluating the QWL, the data indicated no statistically significant differences when considering the nurses' education level ($P=0.410$). However, findings revealed that female nurses (t=-2.010, $P=0.045$), married nurses (t = 2.660, $P=0.008$), and those on fixed shifts (t = 5.678, $P<0.001$) perceived a higher QWL compared to their counterparts. Regarding OCB, there was no statistically significant difference based on marital status ($P=0.160$) and education level ($P=0.706$). Nevertheless, female nurses exhibited a higher average level of OCB than their male counterparts (t=-3.338, $P=0.001$), and nurses on fixed shifts showed a greater tendency towards OCB compared to those on rotating shifts (t = 6.601, $P<0.001$) (Table 2).

The findings from Pearson's correlation coefficient test reveal that as nurses age (r=-0.118, $P=0.029$) and gain more work experience (r=-0.132, $P=0.015$), their perception of QWL decreases. Similarly, as nurses grow older (r=-0.124, $P=0.021$) and accumulate more experience (r=-0.125, $P=0.020$), their engagement in OCB also declines. Furthermore, there is a strong, direct relationship between SLS and both QWL ($r=0.680$, $P<0.001$) and OCB ($r=0.727$, $P<0.001$). Additionally, a positive, moderate to strong and significant correlation was found between QWL and OCB ($r=0.583$, $P<0.001$) (Table 3).

The findings from the regression models are detailed in Table 4. Model 1 demonstrates that SLS ($\beta=0.615$, $P<0.001$) and QWL ($\beta=0.165$, $P=0.001$) have a significant positive impact on OCB. Together, these factors account for approximately 54% of the variance in OCB. In Model 2, it was found that SLS ($\beta=0.663$, $P<0.001$), QWL ($\beta=0.160$, $P=0.001$), gender ($\beta=0.126$, $P=0.011$),

Table 4 Multiple regression models for predicting organizational citizenship behavior

Predictors	B	SE	β	*P*	R^2 (Adjusted R^2)	F(*P*)
Model 1						
SLS	0.666	0.054	0.615	< 0.001	0.543 (0.540)	202.283 (< 0.001)
QWL	0.228	0.069	0.165	0.001		
Durbin-Watson	2.037					
Tolerance	0.538					
VIF	1.858					
Model 2						
SLS	0.719	0.060	0.663	< 0.001	0.556 (0.548)	70.235 (< 0.001)
QWL	0.221	0.069	0.160	0.001		
Gender (female)	0.187	0.073	0.126	0.011		
Marriage (married)	0.065	0.050	0.048	0.200		
Education (higher)	-0.051	0.072	-0.026	0.474		
Shift (rotating)	0.144	0.070	0.112	0.041		
Durbin-Watson	2.045					
Tolerance	(0.426–0.987)					
VIF	(1.013–2.345)					

and work shift (β = 0.112, *P* = 0.041) all significantly and positively influenced OCB. The variables included in Model 2 explained around 55% of the variability in OCB.

Discussion

The present study emphasizing that a significant proportion (64.5%) of nurses reported a moderate level of WQL. This suggests that while their needs for job satisfaction, work-life balance, and well-being are being met to some extent, there are still areas that could be improved. Factors such as workload, workplace support, job security, and opportunities for professional development might be adequate but not optimal. The findings of this study are consistent with the results of research conducted by Asadi et al. and Kamel et al., which assessed the quality of work life of nurses as being at a moderate level [13, 38]. The findings of this study diverged from the research conducted by Ebrahim et al., who reported a high level of quality of work life among nurses [15]. Also, the results were not consistent with the study by Raeissi et al., which evaluated the quality of work life among nurses as low [39]. This difference in the lack of alignment between the findings can be explained by variations in the population and research sample, as well as differences in the temporal and spatial context of the study, and disparities.

The study's findings indicated significant differences in the perception of QWL among nurses based on their gender, marital status, and shift type. Female nurses exhibited a higher perception of QWL compared to their male counterparts. Additionally, married nurses reported a higher perception of QWL compared to single nurses. Furthermore, nurses working fixed shifts demonstrated a significantly higher perception of QWL compared to those on rotating shifts. These findings suggest that gender, marital status, and shift type are important factors influencing nurses' perceptions of their work environment and overall well-being. Female nurses may have different expectations and experiences in the workplace compared to male nurses, which can influence their perception of QWL. Cultural and social norms might play a role in shaping these perceptions. Married nurses might receive more emotional and practical support from their spouses, enhancing their QWL. This support can help them manage work-related stress and maintain a healthy work-life balance. Fixed shifts provide a consistent schedule, reducing the stress and unpredictability associated with rotating shifts. This stability can lead to better sleep patterns, health, and overall job satisfaction, positively influencing QWL. Creating policies that promote a positive work environment and equitable treatment for all nurses, regardless of gender, marital status, or shift type, can enhance QWL across the board.

Gender, marital status, and work shift were the sociodemographic factors that have a relationship with nurses' QWL [10, 39–41]. For instance, being married had a significant effect on the nurses' QWL [39, 42, 43]. Some studies indicate that female nurses have the lowest QWL satisfaction [40], while others show that male nurses report lower QWL than female nurses [39, 41]. Ljevak et al. found that shift work nurses face higher stress levels, reduced coping abilities, and lower life enjoyment than day work nurses. They also report increased anxiety, stress, psycho-organic symptoms, and sleep disturbances. Additionally, shift nurses experience negative effects like decreased social functioning and less family and leisure time [44]. The results of other studies indicates that nurses employed in rotating shifts reported a diminished QWL [45]. Wang et al. demonstrated that nurses working on the night shift (no fewer than two nights per week) exhibited a lower QWL compared to

those working other shifts [46]. In contrast to the present study, Lebni et al. found that nurses had a higher mean QWL score while working rotating shifts [41].

The result reveal a statistically significant but weak and negative correlation between age, work experience, and nurses' perception of QWL. As nurses grow older, their perception of QWL tends to decline slightly. Similarly, the accumulation of nurses work experience is also associated with a diminished perception of QWL. This could be due to factors such as physical fatigue, burnout, or changing priorities as they grow older. Older nurses may also have higher expectations for work-life balance, which, if unmet, could lead to dissatisfaction. Experienced nurses may also feel undervalued or face limited opportunities for career advancement, which could negatively impact their QWL. Healthcare organizations should address the unique challenges faced by older and experienced nurses through flexible scheduling, wellness programs, fostering a supportive work environment and mentorship or leadership opportunities to improve their QWL.

The result was consistent with findings from a previous study. Wang et al. found that age was a negative variable of nurses' QWL [46]. In contrast to the present study, Alharbi et al. found that nursing experience exceeding ten years significantly impacted nurses' QWL. Also, the age group of 47 years and older had a positive effect on QWL [42]. The findings of the study by Kaddourah et al. showed that total years of nursing experience significantly affect nurses' satisfaction about QWL [43]. In a study done by Raeissi et al. older nurses had significantly higher mean of QWL than younger nurses [39]. Lebni et al. found that that there nurses with 15 years of work experience and above had a better mean of QWL [41]. The contradictory results of the research indicate a gap in the existing knowledge regarding the QWL for nurses in different settings based on their sociodemographic characteristics, and further studies on this topic are necessary.

Also, the finding conveys that a considerable portion (65.4%) of nurses demonstrated a moderate level of OCB. This means that nurses demonstrate helpful behaviors that support others, extending beyond their official job duties to a moderate level. Although these behaviors are neither encouraged nor rewarded by the organization, most nurses adopt a balanced approach to voluntarily assisting beyond their official responsibilities. The result of the present study align with the findings of research conducted by Kamel et al. and Sadeghi et al., which evaluated the level of organizational citizenship behavior among nurses as being at a moderate level [38, 47]. While, the results of the present study did not align with the findings of the research conducted by Dargahi and Morshedi Torbati, which evaluated the level of organizational citizenship behavior among nurses as being below average [48].

In the present study, the results indicated a significant difference in the average levels of OCB between male and female nurses. Specifically, female nurses exhibited a higher average level of OCB compared to their male counterparts. This statistically significant finding suggests that female nurses are more likely to engage in voluntary, beneficial workplace behaviors that contribute to the overall organizational environment. Societal expectations and gender roles often emphasize nurturing and collaborative behaviors in women, which might translate into higher OCB in the workplace. Also, female nurses may perceive their roles and work environment differently, possibly experiencing more supportive relationships with colleagues and patients, which can enhance OCB. In contrast to the present study, other studies found no difference between women and men in terms of organizational citizenship behavior [47, 49–51].

The analysis revealed a significant difference in OCB between nurses working fixed shifts and those on rotating shifts. Fixed shift nurses demonstrated a greater tendency towards OCB compared to their counterparts on rotating shifts. This implies that shift structure is a meaningful factor influencing discretionary, extra-role behaviors that benefit the organization, such as assisting colleagues, volunteering for additional tasks, or demonstrating initiative. Fixed shifts provide a consistent schedule, which can lead to a more predictable work-life balance and reduced stress. This stability might enable nurses to engage more in OCB. Fixed shift nurses may have more consistent interactions with the same colleagues, fostering stronger relationships and a sense of community, which can enhance OCB. Providing additional support for nurses on rotating shifts, such as wellness programs and flexible scheduling options, may help mitigate the challenges they face and encourage OCB. In contrast to the present study, Ibrahim et al. found the there were no statistically significant differences between OCB with nurses' shift [50].

The study's findings indicate a significant inverse and weak relationship between nurses' age, work experience, and their involvement in OCB. As nurses grow older, their involvement in OCB tends to decline slightly. Also, nurses with more experience tend to exhibit lower levels of OCB. These results suggest that older and experienced nurses may also feel that their extra efforts are not adequately rewarded, leading to reduced motivation for discretionary behaviors. Implementing support programs tailored to the needs of older and more experienced nurses, such as wellness programs, stress management, and flexible scheduling, can help mitigate the enhance in OCB. Developing recognition and reward systems that acknowledge and incentivize OCB among nurses of all

ages and experience levels can help maintain high levels of engagement. Offering continuous professional development opportunities and promoting a positive work environment can help sustain OCB throughout a nurse's career.

In contrast to the present study, Zeng et al. found that nurses aged 45 or older, with more than 20 years of nursing experience, exhibited higher OCB scores [49]. Similarly, the findings of Sadeghi et al.'s study indicated that nurses' OCB has a positive and significant statistical relationship with both age and work experience [47]. Other studies found no statistically significant relationship between OCB with age and work experience [50, 51]. The inconsistent findings from the research reveal a knowledge gap concerning the OCB of nurses across diverse settings influenced by their sociodemographic traits. This underscores the necessity for additional studies in this area.

The results indicate strong, positive and statistically significant correlations between SLS and both QWL and OCB. This suggests that when nurses perceive their leaders as practicing servant leadership -characterized by empathy, support, and a focus on employee well-being- they are more likely to report a higher QWL. Also, the findings suggest that nurses supervised by servant leaders demonstrate a higher propensity to engage in discretionary, extra-role behaviors that extend beyond formal job requirements, exemplifying OCB. These behaviors notably include assisting colleagues, volunteering for additional responsibilities, and exhibiting proactive problem-solving—actions that collectively enhance organizational efficacy and workplace cohesion. Healthcare organizations should prioritize the development of servant leadership skills among nurse managers and other leaders. Training programs focused on empathy, active listening, and employee empowerment could help cultivate a SLS. Servant leaders can improve nurses' QWL by addressing their needs, providing emotional support, and fostering a work environment that promotes work-life balance. This, in turn, can lead to higher job satisfaction and retention. By creating a culture of trust and collaboration, servant leaders can encourage nurses to engage in OCB. Recognizing and rewarding such behaviors can further reinforce their importance.

The finding indicates a moderate to strong and positive correlation between QWL and OCB among nurses. This finding could imply that improving nurses' QWL may foster better OCBs, such as helping colleagues, being proactive, and going above and beyond job requirements. This can have important implications for workplace policies and practices aimed at enhancing employee well-being and organizational effectiveness. Healthcare authorities should prioritize initiatives that improve nurses' QWL, such as providing adequate resources, reducing workload, providing opportunities for professional development, and promoting a supportive work environment. Addressing factors like work-life balance, job security, and recognition can directly contribute to higher QWL, which in turn may encourage nurses to engage in OCB.

Results of multiple regression analysis are presented in the two following models. Model 1 demonstrates that both SLS ($\beta = 0.615$) and QWL ($\beta = 0.165$) have significant positive impacts on OCB, with SLS showing a stronger influence. These findings suggest that improving SLS and QWL within the studied context is likely to enhance OCB. In order to examine the impact of demographic characteristics in predicting OCB, gender, marital status, education level, and working shifts of nurses were added to model one. Model 2 demonstrates that SLS, QWL, gender, and work shift all have significant and positive impacts on OCB. Notably, SLS ($\beta = 0.663$) shows the strongest positive association with OCB. QWL ($\beta = 0.160$) has a noteworthy yet smaller positive impact. Gender (female; $\beta = 0.126$) is moderately significant, while shift (rotating; $\beta = 0.112$) has a minor but significant effect. These findings suggest that enhancing SLS and QWL, along with considering gender differences and work shift arrangements, can effectively improve OCB within the studied context.

The research substantiates the influential role of SLS in shaping OCB, a fact well supported by various studies [22–24, 29]. Servant leaders effectively exemplify altruism and admirable conduct, serving as models worth following. Their unwavering dedication distinguishes them and significantly influences the behavior of their followers [52]. Through the power of observation, people learn and strive to imitate these virtuous examples, resulting in positive transformations in their own conduct. The outcomes align seamlessly with the social learning theory and social exchange theory, which underscores the mutual essence of SLS [22]. This signifies that when employees perceive their leaders placed their needs and interests above all else, fostering their growth and empowerment, they eagerly display discretionary behavior as a token of gratitude [23]. Therefore, implementing SLS motivates employees to exceed role expectations and demonstrate OCB.

In this study, a positive relationship was found between SLS and nurses' QWL, which corroborated findings from previous studies [19, 53]. Servant leaders prioritizing employee needs [25]. Creating a nurturing work environment, servant leaders play a pivotal role in enhancing the overall well-being of their followers [19]. By fostering this supportive setting, servant leaders actively contribute to improving their followers' QWL [53].

In line with prior research [32, 33, 54], this study clearly shows that nurses with a strong sense of QWL are more

likely to exhibit OCB. According to the QWL theory, if nurses enjoy favorable work conditions like job security, fair remuneration, positive work connections, and a conducive environment, they are inclined to exhibit OCB, ultimately benefiting the organization [32]. When employees have a good work life, they have a better work environment that promotes ethical standards. This sets the stage for cultivating OCB [54].

Limitations and future directions

Several limitations should be considered when interpreting the study findings. First, the reliance on self-administered data may introduce response bias, potentially compromising the reliability of the results. Second, the cross-sectional design restricts causal inferences, as it precludes the examination of temporal relationships between variables. However, rigorous methodological design and systematic manipulation of the independent variables may preserve the construct validity and accurate measurement of OCB. To address these limitations, future research should adopt multiphase, multisource longitudinal designs to strengthen causal inferences and align with best practices for establishing temporal precedence.

This study prioritizes nurses' perceptions of servant leadership rather than relying on nursing leaders' self-assessments. To advance understanding of these dynamics, future research should compare the effects of leader self-assessment and subordinate-rated servant leadership styles on organizational citizenship behavior. Such comparisons could clarify discrepancies between leader self-perceptions and subordinate evaluations, offering deeper insights into their distinct impacts on workplace outcomes.

The applicability of the findings is constrained by methodological and demographic factors. Data collected exclusively from nurses across five university hospitals limits the generalizability of the results to broader healthcare contexts or non-academic settings. Future studies should replicate this research in diverse organizational environments and populations to assess the transferability of the findings. Additionally, the demographic homogeneity of the sample-predominantly female participants- necessitates caution when extrapolating these results to gender-balanced groups, as potential differences in organizational citizenship behavior or leadership perceptions may arise across genders.

Future research should use longitudinal designs to track changes in QWL and OCB over time in response to servant leadership interventions. Finally, factors such as workplace stress, job burnout, and individual personality traits, which might mediate or moderate the relationships studied, were not considered in this study. Therefore, examining these factors as mediators or moderators could provide a deeper understanding of their roles and interactions within the study's framework. Incorporating these variables might also enhance the robustness and applicability of the findings across diverse workplace settings and individual differences.

Implications for nursing management

The results of the study have implications for nursing managers in health care organizations. The study demonstrates the influence of SLS on nurses' QWL and OCB. This emphasizes the necessity of incorporating servant leadership principles into nursing leadership practices. To implement these findings, nursing managers should prioritize leadership training that focuses specifically on developing servant leadership skills. This entails emphasizing qualities like empathy, active listening, and care for the well-being of nursing staff. Moreover, it is crucial to establish a conducive work environment that acknowledges the factors that impact employees' professional well-being. These factors include workload, maintaining a work-life balance, and providing career growth opportunities. In order to foster a positive culture and enhance job satisfaction, it is crucial to incorporate the recognition and appreciation of nurses' OCB. To promote staff well-being and professional development, nursing managers should implement strategies such as offering flexible work arrangements, implementing mentorship programs, and providing continuous learning opportunities. This will improve nurse QWL and OCB, benefiting both staff and the healthcare organization. Designing policies that recognize and reward OCB can contribute to a more equitable and productive work environment.

Conclusion

The study emphasize the importance of integrating SLS practices into healthcare management to improve nurses' QWL and promote behaviors that benefit the organization. It is recommended that healthcare system managers prioritize training head nurses in the SLS and encourage them to use this leadership style to enhance the quality of work life and OCB of nurses. Future research should explore additional factors influencing OCB and examine the long-term effects of servant leadership in diverse healthcare settings to further validate and expand upon these findings.

Abbreviations

SLS	Servant Leadership Style
QWL	Quality of Work-Life
OCB	Organizational Citizenship Behavior

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Author contributions
A.S, M.M.J, M.M.B, L.T Study conception and design. M.M.B collected data. A.S, L.T, M.M.J analyzed and interpreted data. A.S, M.M.B, M.M.J drafted the article. L.T, A.S critical review of the manuscript. All the authors have carefully reviewed the article and approved the final draft.

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Data availability
The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
This study was carried out in accordance with the principles outlined in the updated Declaration of Helsinki. The code of ethics with the number IR.UMSHA.REC.1398.440 was acquired from Hamadan University of Medical Sciences' Ethics Committee. Participation was voluntary. Consent was obtained and confidentiality kept.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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