Original Article

Work-Related Stress: Implications for Physical and Psychological Health among Female Pharmacists Working in Saudi Arabia

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Abstract

Work-related stress has been a major topic for researchers and practitioners working in organizational behavior, psychology, health, and medicine for the past two decades. It has detrimental effects on employees' well-being and its impacts extend far beyond to affect the organization's productivity and operational efficiency. This study aims to investigate work-related stress as it is perceived by female pharmacists working in private pharmaceutical settings in Saudi Arabia. This was a cross-sectional study conducted on a convenience sample of female pharmacists working in the private pharmacy sector using A Shortened Stress Evaluation Tool (ASSET) as a pre-validated instrument intended to evaluate employee perceptions of the sources of pressure and the outcomes of work-related stress. A total of 232 female pharmacists participated in the study with a mean age of 26.1 ± 2.4 years, the majority of the respondents being Saudi (90.1%). The mean ASSET score was 105.6 ± 37.4 for stressor perceptions at work (moderate level). In the organizational commitment questionnaire, the calculated mean score was 36.5 ± 10.5 (moderate level). In the health questionnaire, the mean score was 37.3 ± 11.8, which is perceived as poorer health. Female pharmacists working in the private pharmaceutical sector in Saudi Arabia experience a moderate level of stress as part of their current jobs. The result from the mean ASSET score can empower organizations – leaders, and policymakers – to make the changes necessary to improve their work environment, to accommodate their pharmacists' needs, and thus retain these valuable employees.

Keywords: Job stress, Women, Pharmacists, Private sector, Saudi Arabia

Introduction

Work-related stress (WRS) has been a major topic of interest for researchers and practitioners working in the field of organizational behavior, psychology, health, and medicine for the past two decades [1, 2]. It can be defined as an individual's reactions to the characteristics and indicates a poor relationship between coping skills and the work environment [3, 4]. It has detrimental effects on employees' well-being and its impacts extend far beyond to affect the organization's productivity and operational efficiency [5, 6]. The extent of stress may be difficult to quantify due to the wide range of measures and differences in the methodological approaches used [7, 8]. However, it costs the global society untold billions in direct and indirect costs incurred by employee turnover, sickness absence, and health care services provision, as well as other negative outcomes such as underperformance and counterproductive work behaviors [9-11].

Studies have shown that different professions and career levels entail different levels of WRS [12, 13]. As might be expected, the nature of the work of healthcare professionals, including the high workloads and levels of responsibility, makes them particularly susceptible to experiencing workplace stress [14, 15]. One such group that is increasingly affected by WRS is pharmacists; substantial evidence associates their stressful profession with impaired physical and mental well-being and even impaired professional practice [16, 17]. This is a direct result of the long hours and intense pressures that practicing pharmacists endure; their heavy responsibilities and workloads can be detrimental not only to their health but also to their ability to function at peak

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levels [18, 19]. This can lead to poorer-quality healthcare services being delivered and, eventually, loss of business stakeholders' confidence and poor financial performance [20, 21].

Returning to the effects of, particularly, chronic and severe WRS on employees' physical and psychological health, the literature presents ample evidence of its association with, among other things, burnout, job dissatisfaction, absenteeism, stress-related injuries, and intention to quit [22, 23]. In one study, hospital and community pharmacists in Northern Ireland were found to experience moderate levels of WRS [24, 25]. Higher levels of WRS were found among a large sample of community pharmacists in France; around a third of respondents reported being strongly affected, and the study also uncovered links between WRS and conditions like anxiety, depression and fatigue, with their concomitant treatments, notably anxiolytic and hypnotic drugs [26, 27].

Furthermore, several studies revealed that younger employees and women are more at risk of experiencing WRS and its attendant complications [12, 24, 28, 29]. In Saudi Arabia, there are 27,529 pharmacists employed in different sectors, of which 35.2% are Saudi nationals and 18.9% are women [30, 31]. Currently, a growing number of female pharmacists in Saudi Arabia are joining the wide-ranging private pharmacy profession, which is rewarding and challenging [31, 32]. However, none of the existing literature explores WRS specifically among female pharmacists working in the private sector in Saudi Arabia [33]. Therefore, we conducted this research to investigating workplace stress as it is perceived by female pharmacists working in private pharmaceutical settings. This study also examined the associations between the characteristics of female pharmacists and how highly they rate their job, what attitudes they have toward their organization and the state of their psychological and physical health.

Materials and Methods

Study Design and Population

This was a cross-sectional study using Google Forms to distribute a web-based survey to a convenience sample of female pharmacists working in different private settings including community pharmacies, pharmaceutical companies, private hospitals, and other private pharmacy settings. Before the start of the study, each participant was informed about the purpose of the questionnaire and asked to complete and return it within 14 days.

Study Survey

The survey measured WRS using a self-administered questionnaire known as A Shortened Stress Evaluation Tool (ASSET) as a screening tool to assess the risk of WRS among their employees [34]. ASSET is divided into three sub-questionnaires, each of which incorporates different aspects of the ASSET model. The first questionnaire (37-item) measures the individual's perception of stressors in their work on a six-point Likert scale ranging from 1 = strongly disagree to 6 = strongly agree, with higher scores indicating higher perceived stressors. The second questionnaire (9-item) measures the individual's commitment to the organization on a six-point Likert scale ranging from 1 = strongly disagree to 6 = strongly agree, with higher scores indicating higher levels of commitment. The third questionnaire (19-item) measures the individual's health, divided into two subscales that measure, respectively, physical and psychological health, on a four-point Likert scale that never = 1, rarely = 2, sometimes = 3, and often = 4) with higher scores indicating poorer psychological and physical health.

Statistical Analysis

Descriptive statistics including percentages, mean, standard deviation (SD), median and interquartile ranges were calculated for the demographics and workplace characteristics of the participants and the results of the study. Univariable associations were performed using linear regression. The associations between the demographic and work characteristics of the survey respondents and the study outcomes were examined in two stages. The first stage examined the separate association between each factor and each outcome. All outcome scores were found to be normally distributed. Therefore, the unpaired t-test was used to compare characteristics with only two categories. Analysis of variance was used for characteristics with three or more categories. The second stage of the analysis examined the joint association of the outcomes in a multivariable analysis. This stage of the analysis was performed using multiple linear regression. Both characteristics and the ASSET scores were included as predictors in this analysis, provided that they met the threshold of a *p-value* <0.2 of the univariable analyses. Only factors showing some association with the outcome from the initial analyses (p <0.2) were included in this stage of the analysis. A backward selection was performed to retain only the significant factors associated with the outcome in the final model. Statistical significance was established at *p*-value < 0.05. The analysis was performed with IBM® SPSS® software version 24.0 (Armonk, NY: IBM Corporation, 2016).

Results and Discussion

At the end of the survey period, data had been collected from 232 female pharmacists with a mean age of 26.1 ± 2.4 years. The majority of the participants were Saudi (90.1%). More than three-quarters (80%) were single and a higher percentage (88%) had no children. A minority of participants (10%) indicate that they hold a graduate degree. More than half (58%) worked for pharmaceutical companies, 25% worked in community pharmacies, and 16.8% were in hospital pharmacies. The median time with the current employer was 12 months, with a median of 10 months in their current position. Around 80% of respondents earned ≤15,000 SAR/month. For the majority of staff (95%) their job was full-time **(Table 1)**.

Perceptions of Job (Workplace Stress)

The mean ASSET scores were 105.6 ± 37.4 for perceptions of stressors in a job **(Table 2)**. The main stressors identified were aspects of the job (such as physical working conditions, type of tasks, and amount of satisfaction derived from the job) that had the highest mean ASSET subscales score (23.9 ± 8.2), followed by work relationships, job security, and work-life balance with mean scores of 20.9 ± 9.5, 12.6 ± 4.8, and 12.1 ± 4.9, respectively **(Table 2)**.

Table 1. Summary of female pharmacists' demographics and workplace characteristics

Respondent Demographics and Workplace Characteristics	Results
Mean age ± (SD)	26.1 ± 2.4
Age (years):	
≤ 25	113 (48.7%)
26 and above	119 (51.3%)
Nationality:	
Saudi	209 (90.1%)
Non-Saudi	23 (9.9%)
Marital status:	
Single	185 (79.7%)
Married	45 (19.4%)
Separated	2 (0.9%)
Number of children:	
None	204 (87.9%)
1	13 (5.6%)
2	13 (5.6%)
3	0 (0.0%)
4	2 (0.9%)
Parental caring responsibilities:	
No	123 (53.0%)
Yes	109 (47.0%)
Educational level:	
Undergraduate degree (Bachelor of Science/Doctor of Pharmacy)	214 (92.2%)
Graduate degree	18 (7.8%)
Workplace setting:	
Pharmaceutical company	134 (57.8%)
Community pharmacy	58 (25.0%)
Hospital pharmacy	39 (16.8%)
Other	1 (0.4%)
Organization nationality:	
Saudi	134 (87.9%)
International	13 (5.6%)
Province where you were raised:	
Central	137 (59.1%)
Western	60 (25.9%)
Eastern	14 (6.0%)
Northern	3 (1.3%)
Southern	8 (3.5%)
Abroad	10 (4.3%)
Province where you studied:	
Central	136 (58.6%)
Western	62 (26.7%)
Eastern	10 (4.3%)
Northern	3 (1.3%)
Southern	8 (3.5%)
Abroad	13 (5.6%)
Province where you work:	
Central	153 (66.0%)
Western	55 (23.7%)
Eastern	14 (6.0%)
Northern	4 (1.7%)
Southern	6 (2.6%)
Average months with current employer [inter-quartile range]:	12 [4-24]
Time current employer:	
< 1 year	114 (49.4%)
1 – 2 years	55 (23.8%)
2+ years	62 (26.8%)
Average months in a current position [inter-quartile range]:	10 [3-21]
Time in current position:	
< 1 year	125 (54.1%)
1 – 2 years	52 (22.5%)
2+ years	54 (23.4%)
Salary (SAR/month):	
5,000 – 10,000	78 (34.1%)
10,000 – 15,000	106 (46.3%)
15,000 – 20,000	37 (16.2%)
20,000 – 25,000	6 (2.6%)
25,000 – 30,000	1 (0.4%)
30,000 – 35,000	0 (0.0%)
> 35,000	1 (0.4%)
Employment status:	
Full-time	220 (94.8%)
Part-time	12 (5.2%)
Next promotion expected:	
Within 1 year	97 (41.8%)
1 – 5 years	115 (49.6%)
> 1 year	5 (2.2%)
Never	15 (6.5%)

Statistics are number (percentage), mean ± standard deviation, or median [inter-quartile range].

Attitudes Toward the Organization (Organizational Commitment)

The mean ASSET score was 36.5 ± 10.5 for the attitude toward their organization **(Table 2)**. ASSET divides organizational commitment into two subscales: commitment of the organization to the employee (20.6 ± 6.2) and commitment of the employee to the organization (15.9 ± 4.7) **(Table 2)**. The commitment of an organization measures the extent to which its employees feel that the organization is committed to them, whereas the latter measures the degree to which employees feel loyal and committed to their organization.

Health (Physical Health and Psychological Well-Being)

The mean ASSET score was 37.3 ± 11.8 for health **(Table 2)**. ASSET divides the state of health into two subscales: physical health (mean ± SD score: 14.2 ± 4.3) and psychological well-being (mean ± SD score: 23.0 ± 8.2) **(Table 2)**. Poor health can be indicative of excessive workplace pressure and the level of stress experienced by employees.

Table 2. Job stress outcome summaries (ASSET Scale)

The outcome of the ASSET Scale and Subscales	Scale Range	Mean ± SD
Perceptions of your job:		
Work relationships	8 – 48	20.9± 9.5
Work-life balance	4 – 24	12.1 ± 4.9
Overload	4 – 24	10.8 ± 5.1
Job security	4 – 24	12.6 ± 4.8
Control	4 – 24	11.2 ± 4.7
Resources and communications	4 – 24	10.9 ± 5.3
Pay and benefits	1 – 6	3.2 ± 1.7
Aspects of the job	8 – 48	23.9 ± 8.2
Perceptions Total	**37 – 222**	**105.6 ± 37.4**
Attitudes towards your organization:		
Commitment of organization	5 – 30	20.6 ± 6.2
Commitment of employee	4 – 24	15.9 ± 4.7
Attitudes Total	**9 – 54**	**36.5 ± 10.5**
Health:		
Physical health	6 – 24	14.2 ± 4.3
Psychological well-being	11 – 44	23.0 ± 8.2
Health Total	**17 – 68**	**37.3 ± 11.8**

Univariable Analyses

Perceptions About Job Stressors

When each variable was considered separately, there was evidence that nationality, workplace setting, organization nationality, salary, and next expected promotion were significantly associated with the ASSET perceptions subscale score **(Table 3)**. A relatively small number (n = 23) of respondents were non-Saudi. However, these had significantly higher ASSET perceptions subscale scores, with a mean of 125.3 ± 22.7, compared to Saudis. Moreover, female pharmacists working for pharmaceutical companies had the lowest perception scores (98.4 ± 34.7), with high scores for those working in community pharmacies (110.7 ± 39.9), and particularly those in hospital pharmacies (122.0 ± 37.5). The average scores of those working in hospital pharmacies were 24 units higher than those for those from pharmaceutical companies. Additionally, female pharmacists working for international organizations had lower scores, on average 17 units lower than those working for Saudi organizations. A higher salary was also associated with lower perception scores. The mean score was 113.1 ± 40.9 for those earning up to 10,000 SAR/month but fell to 90.4 ± 29.8 for those earning > 15,000 SAR/month. There was little difference in scores between those who expected one promotion within a year and those who expected one promotion after a year. However, the small number of female pharmacists who never expected a promotion had larger perception scores (132.0 ± 37.4), on average almost 30 units higher than the other two groups.

Attitudes Toward Organization

The results suggest that nationality, workplace setting, time with current employer ($p = 0.02$), and time in current position were all significantly associated with the ASSET organization subscale score. There was also some evidence that the nationality of the organization, the salary, the employment status, and the likely time of the next promotion were also associated with the attitude subscale score. However, the results for all four of these variables were only of borderline statistical significance. Non-Saudis had significantly lower organizational attitude scores (31.8 ± 10.7) than Saudis (37.0 ± 10.3). There was a mean difference of around 5 units between the two groups. The workplace setting results suggest that the lowest scores were among those working in hospital pharmacies (33.4 ± 11.3), compared with those working in pharmaceutical companies (37.9 ± 10.0), who had the highest scores, on average 38 units. Additionally, a longer period with the current employer and a longer period in the current position was associated with lower organizational attitude scores. For both variables, there was relatively little difference between those in the <1 year and the 1–2 year categories, but noticeably lower scores were observed in the group with a time of 2 years or more.

Physical Health Subscale

The results suggest that only parental caring responsibilities were significantly associated with ASSET physical health subscale score ($p = 0.04$). There was also slight evidence that the province in which the respondent studied was also associated with the respondent's physical health, although this result did not quite reach statistical significance. Respondents with parental caring responsibilities had significantly higher scores, with a mean of 14.9 ± 4.0, compared to 13.7 ± 4.6 for those without such responsibilities **(Table 4)**.

Associations between other ASSET subscales and the respondents' physical health were also examined in **Table 5**. There was no evidence that the pay and benefits question was associated with physical health. However, all other ASSET subscales were significantly associated with physical health when examined individually. For the significant variables, higher values of each subscale were associated with higher physical health scores. For example, a 5 units increase in job security was associated with a 1.4-unit increase in physical health.

Table 3. Associations between female pharmacists' demographics and workplace characteristics and ASSET perceptions subscale score

Variable	n	Mean ± SD‡	p-value
Nationality:			
Saudi	208	103.4 ± 38.1	**0.008**
Non-Saudi	23	125.3 ± 22.7	
Age:			
≤ 25	113	105.1 ± 38.0	0.84
26 and above	118	106.1 ± 37.0	
Marital status:			
Single/separated	186	104.1 ± 38.0	0.24

Married	45	111.5 ± 34.9	
Children:			
No	203	103.9 ± 37.6	0.06
Yes	28	117.8 ± 34.7	
Parental caring Responsibilities:			
No	123	103.7 ± 38.4	0.42
Yes	108	107.7 ± 36.4	
Education level:			
Entry level	213	105.9 ± 37.3	0.64
Graduate	18	101.6 ± 40.0	
Workplace setting[†]:			
Pharmaceutical	133	98.4 ± 34.7	**0.001**
Community pharmacy	58	110.7 ± 39.9	
Hospital pharmacy	39	122.0 ± 37.5	
Organization nationality:			
Saudi	117	114.0 ± 37.7	**<0.001**
International	114	97.0 ± 35.3	
Province raised:			
Central	137	106.2 ± 38.0	
Western	59	104.2 ± 38.5	
Eastern	14	88.6 ± 27.7	0.32
Northern	3	125.7 ± 21.2	
Southern	8	106.4 ± 45.8	
Abroad	10	122.4 ± 25.6	
Province studied:			
Central	136	104.5 ± 38.2	
Western	61	106.6 ± 39.2	
Eastern	10	84.6 ± 27.9	0.27
Northern	3	125.7 ± 21.2	
Southern	8	110.3 ± 40.3	
Abroad	13	120.9 ± 19.7	
Province work:			
Central	153	107.1 ± 36.9	
Western	54	105.7 ± 39.7	0.39
Eastern	14	86.3 ± 30.1	
Northern	4	104.0 ± 46.7	
Southern	6	112.0 ± 40.3	
Time with current employer:			
< 1 year	114	105.0 ± 37.9	0.98
1 – 2 years	54	105.2 ± 39.0	
2+ years	62	106.1 ± 35.3	
Time in current position:			
< 1 year	125	104.1 ± 38.9	0.84
1 – 2 years	52	107.4 ± 37.5	
2+ years	53	106.3 ± 33.6	
Salary (SAR/month):			
5000 – 10000	78	113.1 ± 40.9	**0.005**
10000 – 15000	105	106.4 ± 36.5	
> 15000	45	90.4 ± 29.8	
Employment status:			
Full-time	219	104.7 ± 37.2	0.12
Part-time	12	122.0 ± 39.0	
Next promotion expected:			
Within 1 year	97	104.4 ± 40.4	**0.02**
> 1 year	119	103.2 ± 33.8	
Never	15	132.0 ± 37.4	

[†]Omitting one subject with 'other' workplace setting.
[‡]Mean and standard deviation of perceptions subscale score in each category.

Table 4. Associations between female pharmacists' demographics and workplace characteristics and ASSET attitudes towards the organization, physical health, and psychological health

Variable	n	Organization		Physical Health		Psychological Health	
		Mean±SD[‡]	p-value	Mean±SD[‡]	p-value	Mean±SD[‡]	p-value
Nationality:							
Saudi	209	37.0 ± 10.3	**0.02**	14.2 ± 4.4	0.58	23.0 ± 8.4	0.93
Non-Saudi	23	31.8 ± 10.7		14.7 ± 3.9		23.2 ± 7.3	
Age:							
≤ 25	113	36.5 ± 10.8	0.98	14.3 ± 4.4	0.74	23.6 ± 8.5	0.34
26 and above	119	36.5 ± 10.2		14.1 ± 4.4		22.5 ± 8.0	
Marital status:							
Single/separated	187	36.6 ± 10.6	0.77	14.1 ± 4.3	0.47	22.8 ± 8.3	0.47
Married	45	36.1 ± 9.8		14.6 ± 4.4		23.8 ± 8.1	
Children:							
No	204	36.5 ± 10.5	0.86	14.2 ± 4.4	0.65	23.0 ± 8.3	0.69
Yes	28	36.2 ± 10.7		14.6 ± 4.1		23.6 ± 7.8	
Parental caring responsibilities:							
No	123	36.1 ± 10.9	0.56	13.7 ± 4.6	**0.04**	21.9 ± 8.3	**0.03**
Yes	109	36.9 ± 10.1		14.9 ± 4.0		24.3 ± 8.0	
Education level:							
Entry level	214	36.2 ± 10.5	0.19	14.3 ± 4.3	0.29	23.1 ± 8.3	0.58
Graduate	18	39.6 ± 9.5		13.2 ± 4.3		22.0 ± 8.3	
Workplace setting[†]:							
Pharmaceutical company	134	37.9 ± 10.0		14.0 ± 4.4		22.7 ± 8.1	
Community pharmacy	58	35.3 ± 10.6	**0.04**	13.9 ± 4.2	0.12	22.2 ± 8.1	0.15
Hospital pharmacy	39	33.4 ± 11.3		15.5 ± 4.4		25.3 ± 8.9	
Organization nationality:							
Saudi	117	35.3 ± 10.7	0.07	14.5 ± 4.3	0.30	23.1 ± 8.1	0.84
International	115	37.7 ± 10.1		13.9 ± 4.4		22.9 ± 8.4	

Province raised:							
Central	137	36.7 ± 10.2		14.1 ± 4.3		22.8 ± 8.2	
Western	60	35.9 ± 11.5		14.9 ± 4.4		24.1 ± 8.2	
Eastern	14	37.7 ± 8.0	0.96	12.6 ± 4.1	0.28	20.2 ± 7.9	0.64
Northern	3	32.0 ± 4.6		13.3 ± 2.1		20.3 ± 8.3	
Southern	8	37.4 ± 14.4		12.3 ± 4.8		23.1± 11.2	
Abroad	10	36.2 ± 10.1		15.7 ± 4.2		24.5 ± 7.3	
Province studied:							
Central	136	36.8 ± 10.2		14.0 ± 4.4		22.8 ± 8.3	
Western	62	36.2 ± 11.3		14.8 ± 4.4		24.0 ± 8.3	
Eastern	10	37.5 ± 9.9	0.54	12.3 ± 3.5	0.06	18.8 ± 7.6	0.35
Northern	3	32.0 ± 4.6		13.3 ± 2.1		20.3 ± 8.3	
Southern	8	40.6 ± 9.0		12.1 ± 4.7		21.1 ± 8.5	
Abroad	13	32.4 ± 11.2		16.9 ± 3.4		25.6 ± 7.4	
Province work:							
Central	153	36.8 ± 10.0		14.2 ± 4.3		22.8 ± 8.1	
Western	55	36.1 ± 11.5		15.1 ± 4.4		24.9 ± 8.2	
Eastern	14	36.6 ± 11.0	0.35	12.5 ± 4.1	0.13	19.3 ± 8.0	0.13
Northern	4	26.3 ± 12.1		14.0 ± 2.2		25.8 ± 12.8	
Southern	6	62.7 ± 29.4		11.3 ± 4.8		19.7 ± 8.2	
Time with current employer:							
< 1 year	114	37.9 ± 10.0		14.2 ± 4.7		23.2 ± 9.1	
1 – 2 years	55	37.3 ± 9.1	**0.02**	13.8 ± 4.0	0.67	22.3 ± 7.1	0.74
2+ years	62	33.3 ± 11.9		14.5 ± 3.9		23.4 ± 7.6	
Time in current position:							
< 1 year	125	38.0 ± 10.0		13.9 ± 4.7		22.7 ± 9.1	
1 – 2 years	52	37.8 ± 8.7	**<0.001**	14.6 ± 4.3	0.61	23.3 ± 7.0	0.76
2+ years	54	31.8 ± 11.9		14.5 ± 3.5		23.6 ± 7.3	
Salary (SAR/ month):							
5000 – 10000	78	34.2 ± 11.6		14.8 ± 4.6		23.7 ± 8.6	
10000 – 15000	106	37.9 ± 9.0	0.05	13.9 ± 4.3	0.28	22.7 ± 8.2	0.59
> 15000	45	37.0 ± 11.4		13.7 ± 3.8		22.4 ± 7.9	
Employment status:							
Full-time	220	36.8 ± 10.4	0.05	14.2 ± 4.3	0.93	22.9 ± 8.2	0.26
Part-time	12	30.8 ± 10.5		14.3 ± 4.6		25.7 ± 9.5	
Next promotion expected:							
Within 1 year	97	37.0 ± 10.7		14.0 ± 4.4		22.4 ± 8.8	
> 1 year	120	36.9 ± 9.8	0.05	14.3 ± 4.3	0.74	23.4 ± 7.8	0.55
Never	15	30.1 ± 12.3		14.9 ± 4.7		24.5 ± 7.9	

†Omitting one subject with 'other' workplace setting.
‡Mean and standard deviation of attitude subscale score in each category.

Table 5. Associations between ASSET subscales and ASSET physical health subscale

ASSET Subscale	Coefficient (95% CI)	*p*-value
Work relationships†	0.7 (0.4, 1.0)	**<0.001**
Work-life balance†	1.2 (0.6, 1.7)	**<0.001**
Overload†	1.4 (0.9, 2.0)	**<0.001**
Job security†	1.4 (0.9, 2.0)	**<0.001**
Control†	1.3 (0.6, 1.9)	**<0.001**
Resources and communication†	1.2 (0.7, 1.7)	**<0.001**
Pay and benefits	0.0 (-0.3, 0.3)	0.96
Aspects of the job†	0.9 (0.6, 1.2)	**<0.001**

†Regression coefficients given for a 5 units increase in the subscale.

Psychological Health Subscale

The results suggest that only parental caring responsibilities were significantly associated with the ASSET psychological health subscale score ($p = 0.03$). Respondents with care responsibilities had higher psychological scores (24.3 ± 8.0), on average around 2.5 units higher than those without such responsibilities (21.9 ± 8.3) **(Table 4)**. A summary of the results obtained when each variable was examined individually is shown in **Table 6**. The results suggest that all ASSET subscales, except for pay and benefits, were significantly associated with psychological health. Higher values of all subscales were associated with higher psychological scores.

Table 6. Associations between ASSET subscales and ASSET psychological health subscale

ASSET Subscale	Coefficient (95% CI)	*p*-value
Work relationships†	1.5 (1.0, 2.1)	**<0.001**
Work-life balance†	2.2 (1.1, 3.2)	**<0.001**
Overload†	2.9 (2.0, 3.9)	**<0.001**
Job security†	2.8 (1.8, 3.9)	**<0.001**

Control†	2.8 (1.7, 3.9)	**<0.001**
Resources and communication†	2.6 (1.7, 3.6)	**<0.001**
Pay and benefits	0.2 (-0.4, 0.8)	0.54
Aspects of the job†	1.8 (1.1, 2.4)	**<0.001**

†Regression coefficients given for a 5 units increase in the subscale.

Multivariable Analyses

The multivariable results suggest that both nationality ($p = 0.02$) and organization nationality ($p = 0.001$) were significantly associated with the ASSET perceptions subscale scores. After adjusting for these two variables, there were no longer any significant effects of workplace setting, salary, or when the next promotion is expected. Non-Saudi had higher scores than Saudis, while respondents working for international companies had lower perception scores. There was a mean difference of 19 units between Saudi and non-Saudi and a mean difference of 16 units between those working for local and those working for international companies **(Table 7)**.

Table 7. Associations between female pharmacists' demographics and workplace characteristics and ASSET subscale scores (multivariable analyses)

ASSET Subscale	Variable	Coefficient (95% CI)	p-value
Perceptions	**Nationality:** Saudi Non-Saudi	 0 18.6 (2.8, 34.4)	 0.02
	Organization nationality: Saudi International	 0 -15.6 (-25.0, -6.1)	 0.001
Attitudes towards organization	**Education level:** Undergraduate degree Graduate degree	 0 4.8 (-0.3, 10.0)	 0.07
	Time in current position: < 1 year 1 – 2 years 2+ years	 0 -1.2 (-4.6, 2.1) -8.3 (-11.7, -4.9)	 <0.001
	Salary (Saudi Riyal per month): 5000 – 10000 10000 – 15000 > 15000	 0 4.9 (1.9, 7.9) 4.6 (0.7, 8.4)	 0.005
Physical health	**Parental caring responsibilities:** No Yes	 0 1.0 (0.0, 2.1)	 0.06
	ASSET overload† ASSET job security†	0.7 (-0.1, 1.5) 0.6 (0.1, 1.0)	0.07 0.02
Psychological health	**Parental caring responsibilities:** No Yes	 0 1.9 (-0.1, 3.9)	 0.06
	ASSET overload† ASSET job security†	2.0 (0.7, 3.3) 1.4 (0.0, 2.7)	0.002 0.05

†Regression coefficients given for a 5 units increase in the subscale.

Moving to the organizational attitude, the results suggest some evidence that education level, time in the current position, and salary were associated with the organizational attitude subscale score. After adjusting for these three variables, there was no significant additional effect of nationality, workplace setting, or time with the current employer. The time in the current position was highly statistically significant. A longer time in position was associated with lower scores. Respondents in their current job had scores that were, on average, 8 units lower than those in positions less than a year. The results for salary were significant in the multivariable analysis. The lowest scores were observed for those earning the lowest salary <10,000 SR/month. The scores were highest for graduates, on average, almost 5 units higher than those obtained for having an entry-level degree.

Taking into account the joint association between the characteristics and their ASSET subscales for physical health, the multivariable analysis suggests some evidence that parental care responsibilities ($p = 0.06$), ASSET overload ($p = 0.07$), and aspects of work ($p = 0.02$) were associated with physical health. The results for caring responsibilities and overload were only borderline statistical significance, but it was chosen to retain these two variables in the final model. After adjusting for these two variables, there was no longer a significant effect of any of the ASSET subscales. Those with parental care responsibilities had higher scores than those without, while higher values of the overload and aspects of the job subscales were also associated with a high physical health score. The results for aspects of the job suggest that a 5-unit increase in this score was associated with a 0.6-unit increase in physical health score.

The multivariable results suggest some evidence that parental care responsibilities ($p = 0.06$), overload ($p = 0.002$), and job security ($p = 0.05$) were associated with the psychological health score. After adjusting for these three variables, there was no significant additional effect of any of the other ASSET subscales upon this outcome. A 5-unit increase in overload score was associated with 2 units increase in psychological score. Those with caring responsibilities also had higher outcome scores, on average 1.9 units higher than those without responsibilities.

This is one of the studies that explore WRS among female pharmacists working in the private pharmacy sector in Saudi Arabia. Using ASSET as a tool allowed the current levels of perceived stress among female pharmacists to be identified and associations between the characteristics and ASSET subscale scores to be demonstrated. Overall, female pharmacists working in private pharmaceutical sectors in Saudi Arabia experience a moderate level of WRS as part of their current jobs.

Many employees report experiencing WRS, which compromises both their performance and their health. This study revealed that, overall, female pharmacists had moderate

stress with their current job with a mean ASSET subscales score of 105.6 ± 37.4. They were more troubled by a range of work-related stressors. The main stressors identified were the aspects of work that had the highest mean ASSET subscales score (23.9 ± 8.2), followed by work relationships, job security, and work-life balance with mean ASSET subscales scores of 20.9 ± 9.5, 12.6 ± 4.8, and 12.1 ± 4.9, respectively. These findings are consistent with other studies of pharmacists, which exhibited similar conclusions [24, 28, 29]. Hospital and community pharmacists in Northern Ireland experienced moderate levels of WRS. An itemization of gender indicated that 36% were male and 64% female [24]. A cross-sectional study on clinical pharmacists in 128 hospitals in Vietnam in which the participants were mostly women reported that pharmacists felt moderate stress with their current job [28]. Furthermore, female community pharmacists practicing in England were significantly more affected by a variety of work-related stressors, particularly work-life balance, work overload, job security, and the job itself [29].

Organizational commitment, which can be considered a two-way bond between employees and employers, is crucial in determining not only whether employees stay with their organization over time, but also how motivated they are to help their organization achieve its goals [35]. As it fosters positive feelings of stability, belonging, and loyalty, it can also be perceived as an extension of job satisfaction. The overall mean ASSET score suggests that the respondents felt a moderate level of commitment to their organization, possibly because they found it difficult to share the goals and values of their organization, or because they felt they were required to work under more pressure than should be the norm. This information could prove extremely useful to those in leadership roles in pharmacy settings as it indicates that they might want to take steps to alleviate some of the WRS endured by practicing pharmacists, so as not to risk losing them. Particularly after COVID-19, when resources are depleted yet there is increased demand for services, organizations must retain their skilled and professional employees [36].

Health is the most commonly used index to assess the well-being of individuals. In the present study, the overall mean ± SD ASSET score was 37.3 ± 11.8 for health, which is perceived as poorer health. Poor health can be indicative of excessive workplace pressure and stress. Also, such WRS can hurt a variety of physical and psychological attributes relating to the health of employees and organizations [37].

Practicing pharmacists are at risk of enormous stress arising from various sources [20]. The results showed that respondents' characteristics, such as nationality, workplace setting, organization nationality, salary, and time of likely next promotion, were significantly associated with a range of work-related stressors. In terms of nationality, non-Saudis had significantly higher ASSET perceptions subscale scores compared to Saudis; this finding was supported by the multiple regression analyses, which also found only nationality and organization nationality to be significantly associated with ASSET perceptions subscale scores. Further, a study of workers living abroad systematically reviewed the factors most likely to cause stress and concluded that employees are more likely to suffer from WRS if they are working in a country other than their home [38]. Another study supported this result and identified additional stress-causing factors such as earning non-standard wages, having limited choices, and suffering abuse from employers and local people [39]. According to the literature, living and working in Saudi Arabia is less stressful for Saudis than for non-Saudis, as non-Saudis must navigate the vast cultural differences that exist between the host state and their home countries; and while they struggle to adjust, there is evidence in the literature that they have access to less professional support and tend to find that both their overall well-being and their mental ill-health deteriorate, compared to Saudi workers [40]. Another factor affecting WRS, according to earlier studies, is the workplace setting itself [24, 41, 42]; specifically in the pharmacy sector, previous research found significantly higher levels of stress reported by community pharmacists than by pharmacists working in other sectors [24, 29]. The present study confirms this, as it also found that pharmacists working in hospital and community pharmacies were more stressed than pharmacists working for pharmaceutical companies. Income also has a significant effect on the levels of stress of healthcare personnel [29]. Healthcare professionals were previously found to be more sensitive to income because it has a direct impact on their lives; this is similar to the finding in the present study that a lower salary was associated with higher perception scores (job stress).

Regarding the attitude toward their organization (commitment), the simple regression analysis in the present study identified four significant predictors: nationality, workplace setting, time with the current employer, and time in the current position. Furthermore, in the multiple regression analysis, the results suggest that education level, time in current position, and salary were significantly associated with the attitude towards the organization subscale score. Additionally, the results of this study revealed that holding a graduate degree increases organizational commitment. Earlier studies found similarly strong relationships between organizational commitment and level of education [43-45]. However, in terms of length of employment, the situation is different. While the assumption is often that a longer time with an organization must mean a greater commitment to it, this has not always been borne out by the research. The present study identified a negative and significant correlation between time with current employer and organizational commitment, and other studies have drawn similar conclusions [46, 47], although there are previous studies that have demonstrated a positive link between commitment and time with employer [48, 49].

Regarding respondents' health (physical and psychological), the simple regression analysis suggested that parental caring responsibilities were significantly associated with the ASSET physical health subscale score. Furthermore, in the multiple regression analysis, the aspects of the job such as physical working conditions, type of tasks, and the amount of satisfaction derived from the job and overload subscales were significantly associated with physical and psychological health, respectively. This aspect has a direct impact on the mental and psychological well-being of pharmacists [45]. An increased workload may impact pharmacist stress levels and job satisfaction. Also, a prospective cohort study hypothesizes not only that adverse working conditions hurt health but also that, conversely, being employed with proper working conditions plays a protecting role for both physical and mental health [50].

According to the results, it is necessary to monitor WRS periodically to implement interventions to alleviate it. These interventions should target both organizations, such as redesigning jobs to better spread the workload and improving resources availability, communication, and reward systems; and individuals, such as by teaching stress- and change-management techniques, providing continuous professional development to increase opportunities for promotion, and supporting staff in finding an appropriate work-life balance, engaging in physical activity, and following a healthy lifestyle.

As in other research, this study has some limitations. Questions regarding the perceptions of the respondents about their job, their organization, and their state of health were asked at a single time point, and this must be taken into account when interpreting the results. Additionally, the results might not be representative of the pharmacist workforce in Saudi Arabia because only those working in the private sector were included in this study. Furthermore, selection bias cannot be excluded because pharmacists who are more positive about their job may have been more likely to respond to the survey compared to those who are more negative. In addition, there was no existing, similar research related to this study topic, which hinders any comparison of the results of the present study.

Conclusion

This study found that female pharmacists working in private pharmaceutical sectors in Saudi Arabia experience a moderate level of stress as part of their current jobs. This result suggests that the situation may be manageable and therefore it is possible to put in place measures to improve physical and mental well-being. Knowledge about WRS may empower organizations – leaders, and policymakers – to make the changes necessary to improve the work environment, to accommodate the needs of their valuable pharmacists, and thus to retain them. Saudi Arabia's pharmacy sectors should regularly review the issue of WRS and ensure that both individual and organizational measures are put in place to alleviate it.

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Informed consent was obtained from all participants involved in the study before starting the study.

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