Article

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Abstract: This cross-sectional survey assessed the resilient coping levels and their relationship with the socio-demographic characteristics of nursing professionals in Saudi Arabia. Adult (≥18 years) registered nurses and practicing for ≥1 year were included. Resilient coping levels (as assessed via a 4-item Brief Resilience Coping Scale; BRCS) and socio-demographic and other characteristics data were collected. Descriptive analysis and ordinal logistic regressions were used to analyze the data. Further, the psychometric properties of the BRCS were reported. A total of 216 nursing professionals were included. The mean BRCS score was 14.6 (standard deviation=3.6), with most nursing professionals (62.5%) reporting medium to high resilience coping levels. The ordinal logistic regression model demonstrated that increasing age (p=0.002), best overall health (p=0.001), and nurses posted in the outpatient department (p=0.049) and intensive care unit (p=0.032) had significantly high resilient coping levels. The internal consistency of the BRCS was good (Cronbach's alpha=0.80). In summary, nursing professionals in Saudi Arabia showed medium resilient coping levels. Moreover, this study suggests that BRCS is a psychometrically reliable and adequate tool for assessing resilience coping levels and provides valuable insights into the relationship between resilient coping levels and socio-demographic characteristics of the nursing professionals in Saudi Arabia.

Keywords: brief resilient coping scale; nursing professionals; resilient coping; Saudi Arabia

1. Introduction

Nursing professionals play a key role in the healthcare systems across the world [1]. Despite their invaluable contributions, nurses often experience tremendous stress caused due to several physical (exposure to illness, burnout), psychological (lack of support and acknowledgment, exploitation), and environmental factors (safety at the workplace) [1–3]. Furthermore, lack of appreciation, social status and support, high workload, staffing shortages, under-compensation, etc further increase their stress levels affecting their professional and personal lives [4].

Resilience is an individual's cognitive and behavioral ability to effectively counter the adverse effects of stress and successfully thrive in the face of adversity or traumatic experiences [5]. Several studies have reported high resilience levels improve a person's physical and mental well-being and quality of life [6–9]. In a recent study that investigated the impact of psychological resilience in the context of adverse effects, resilience exerted a protective effect on the well-being of individuals [9]. Similarly, in a survey-based study of 2063 individuals, high resilience levels were reported to exert beneficial effects (i.e., on the perception of stress, psychological responses to stress, and job-related stress) among workers in challenging work environments [8].

Given the highly stressful profession of nursing professionals, resilience could be an important mechanism to protect them against adverse effects of personal and occupational stress [10]. Several studies have reported a positive impact of resilient coping on the personal and professional aspects of nursing professionals [11–14]. In a Japanese study of nurses working in a psychiatric hospital (n=313), nurses who had high resilience levels experienced lower levels of depression and exhaustion [11]. A US-based study reported work satisfaction and resilience positively affected the

organizational commitment of the nurses [12]. Moreover, resilient nurses exhibit better adaptive strategies, and coping skills, and thrive through adversities while delivering quality care to the patients [13,14]. However, little is known about the resilience capacity of the nursing professionals in Saudi Arabia. To address this knowledge gap, the present study explored the resilient coping levels and their relationship with the socio-demographic characteristics of nursing professionals in Saudi Arabia. Additionally, the psychometric properties of the Brief Resilient Coping Scale (BRCS; a tool used to assess resilient coping) in this population were reported.

1. Methods

1.1. Study Design

This cross-sectional survey was conducted between January and May 2023. Adult (18 years or older) registered nursing professionals, working for at least a year, and provided informed consent were eligible for participation in this study. The data collection was done in a tertiary care hospital in Riyadh, Saudi Arabia. The protocol and questionnaire used for the survey were reviewed by the Institutional Review Board (IRB) and was exempted from IRB approval (IRB number: 21-522E).

All study participants were informed about the purpose of the survey and assured that the collected information would be kept confidential and used solely for the study. Following their approval, the data was collected, analyzed, and reported as per the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines (https://www.strobe-statement.org/) [15].

1.1. Socio-Demographic and Other Characteristics

The socio-demographic characteristics *viz.,* age, sex, marital status, education, and nationality, were collected. In addition, information on the years of clinical experience, work shift, posting ward in the hospital, overall health, and the presence of chronic conditions were recorded.

1.1. Resilience Coping Levels

The resilience coping levels of the participants were measured using a 4-item BRCS designed to capture tendencies to cope with stress adaptively. The scale focuses on the tendency to effectively employ coping strategies in flexible, committed ways to actively solve problems despite stressful circumstances. Each item in the scale is scored on a 5-point Likert scale from 1 to 5. The total score is summed from the individual item scores and ranges from 4 to 20 (4–13 indicating low resilient coping; 14–16 indicating medium resilient coping; 17–20 indicating high resilient coping) [16].

1.1. Statistical Analysis

Socio-demographic characteristics (age, sex, marital status, education level, nationality) and other characteristics (clinical experience, work shift, posting ward in the hospital, overall health, and the presence of chronic conditions) were analyzed descriptively. Categorical variables were summarized as absolute values and percentages, while continuous variables were presented as means and standard deviations (SDs). The categorical variables were analyzed using the Chi-square test. For continuous measures, one-way Analysis of Variance (ANOVA) followed by Tukey's post hoc honestly significant difference test was used to detect the difference across the groups. For the multivariate analysis, ordinal logistic regression was used to examine the relationship between resilient coping levels and socio-demographic factors with a 95% confidence interval (CI). The threshold for significance was set at $p<0.05$.

The psychometric properties of the BRCS were based on several analyses. As a measure of internal consistency, Cronbach's alpha was calculated for the BRCS scale and its four items. Pearson correlation (r) was used to measure item correlations. The construct validity of BRCS was evaluated using exploratory factor analysis (EFA) using principal component analysis and varimax rotation. Bartlett's test of sphericity (expressed as χ^2) and the Kaiser-Meyer-Olkin (KMO) were performed. The threshold for Bartlett's test of sphericity was set to $p<0.05$ and KMO values close to 1.0, indicating the usefulness of factor analysis in this study population. The minimum factor loading criteria was set to 0.50. The commonality of the BRCS (which indicates the amount of variance in each dimension) was also assessed to ensure acceptable levels of explanation. Data analyses were performed using

Statistical Package for the Social Sciences (SPSS, version 26.0. IBM, NY, USA) and the software R version 4.4.1 (R Foundation for Statistical Computing, Vienna, Austria).

Results

1.1. Sample Characteristics

Overall, 216 nurses (132 via offline mode, and 84 via online mode) participated in this study. The mean age of the study participants was 32.0 (SD=5.3) years, men (52.8%), and married (58.8%). Participants were predominantly from Saudi Arabia (80.1%), had a bachelor's in nursing (80.6%), and 6 to 15 years of clinical experience (56.5%). Most nurses worked in the morning shift (60.6%) and were posted in an emergency ward (29.2%) followed by surgical and medical wards (Table 1). The overall health of most participants (68.5%) was high (i.e., scored 8–10 on a 10-point rating scale; a lower scale indicates poor health, and a higher score indicates best health), and only 18.5% of the participants reported the presence of a chronic condition (Table 1).

Table 1. Socio-demographic and other characteristics.

	Overall participants (N=216)
Mean (SD) age, in years	32.0 (5.3)
Age group, n (%)	
≤25 years	12 (5.6%)
26–39 years	189 (87.5%)
Over 40 years	15 (6.9%)
Sex, n (%)	
Male	114 (52.8%)
Female	96 (44.4%)
Prefer not to disclose	6 (2.8%)
Marital status, n (%)	
Single	66 (30.6%)
Married	127 (58.8%)
Divorced	19 (8.8%)
Widow	4 (1.9%)
Education, n (%)	
Diploma in nursing	29 (13.4%)
Graduate in nursing	174 (80.6%)
Postgraduation in nursing	13 (6.0%)
Nationality, n (%)	
Saudi	173 (80.1%)
Filipino	22 (10.2%)
Indian	11 (5.1%)
Other	10 (4.6%)
Clinical experience, n (%)	
≤5 years	68 (31.5%)
6–14 years	109 (50.5%)
≥15 years	39 (18.1%)
Work shift, n (%)	
Morning	131 (60.6%)

Afternoon	33 (15.3%)
Evening	24 (11.1%)
Rotating	28 (13.0%)
Posting ward, n (%)	
Emergency	63 (29.2%)
Surgical	49 (22.7%)
Medical	41 (19.0%)
OPD	22 (10.2%)
ICU	18 (8.3%)
PHC	8 (3.7%)
Others	5 (2.3%)
Pediatric	4 (1.9%)
Obstetrics/Gynecology	3 (1.4%)
Laboratory	3 (1.4%)
Overall health*, n (%)	
≤4	25 (11.6%)
5–7	43 (19.9%)
8–10	148 (68.5%)
Presence of a chronic condition, n (%)**	
Yes	40 (18.5%)
No	176 (81.5%)

Abbreviations: ICU, intensive care unit; OPD, outpatient department; PHC, primary healthcare. Notes: *Measured on a 0-10 rating scale (score of ≤4 indicates poor health; score between 5–7 indicates moderate health; score 8–10 indicates best health). **Conditions such as hypertension, diabetes, neurological, cardiovascular, and any other disease.

1.1. Resilience Coping Levels

The mean total score of BRCS among all participants was 14.6 (SD=3.6), indicating medium coping levels. Most participants reported medium to high coping levels (Figure 1).
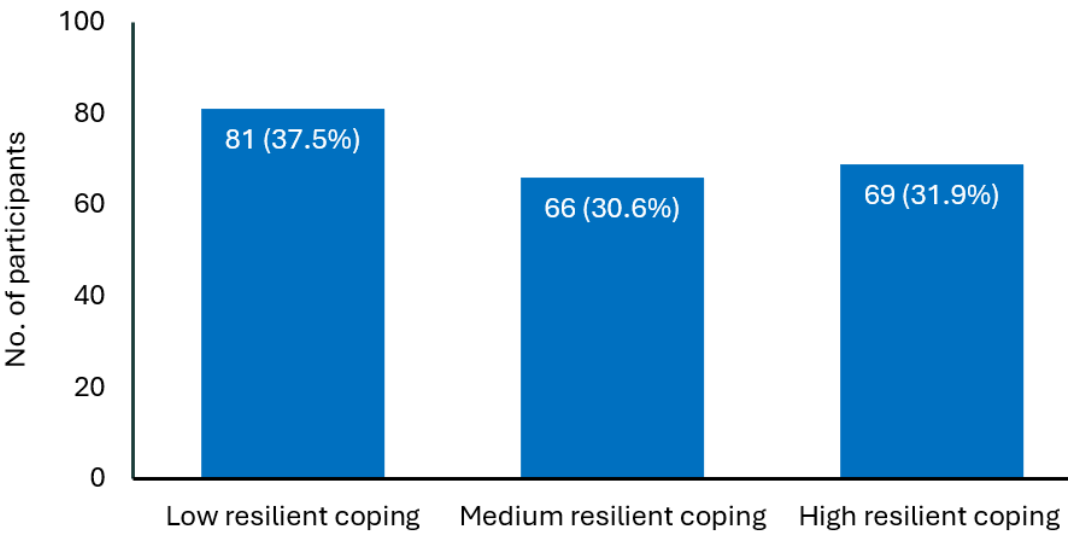
Figure 1. Distribution of study participants based on resilience coping score* (N=216). Notes: *Measured using the Brief Resilience Coping Scale (4–13 indicates low resilient coping; 14–16 indicates medium resilient coping; 17–20 indicates high resilient coping).

1.1. Relationship between Resilience Coping Levels and Socio-demographic and Other Variables

When different levels of resilience coping were analyzed in relation to the socio-demographic characteristics, a significant association was found with the age of the nursing professionals i.e., levels of resilience coping increased with the age of the nursing professionals (F=12.07; p=0.000). Tukey's post hoc analyses confirmed the differences between the groups i.e., the mean age of the nursing professionals with medium and high resilient coping levels was significantly higher than those with low resilient coping (Table 2). Furthermore, a significant association was also found between resilient coping levels and overall health (χ^2=49.34; p=0.000), and the presence/absence of a chronic condition (χ^2=82.22; p=0.000) (Table 2).

Table 2. Relationship between resilience coping levels and socio-demographic and other variables.

Variable	Resilience coping levels			Point estimates	p value
	Low	**Moderate**	**High**		
Age				F=12.07	**0.000[†]**
Mean (SD)	29.9 (5.1)	33.2 (5.0)	33.4 (5.0)		
95% CI	28.79–31.01	31.99–34.41	32.22–35.58		
Sex, n (%)					
Male	40 (35.1%)	37 (32.5%)	37 (32.5%)		
Female	37 (38.5%)	28 (29.2%)	31 (32.3%)	χ^2=2.59	0.628
Prefer not to disclose	4 (66.7%)	1 (16.7%)	1 (16.7%)		
Marital status, n (%)					
Single	28 (42.4%)	18 (27.3%)	20 (30.3%)		
Married	41 (32.3%)	44 (34.6%)	42 (33.1%)	χ^2=6.22	0.399
Divorced	9 (47.4%)	4 (21.1%)	6 (31.6%)		
Widow	3 (75.0%)	0 (0.0%)	1 (25.0%)		
Education, n (%)					
Diploma in nursing	14 (48.3%)	8 (27.6%)	7 (24.1%)		
Graduate in nursing	62 (35.6%)	55 (31.6%)	57 (32.8%)	χ^2=2.21	0.697
Postgraduation in nursing	5 (38.5%)	3 (23.1%)	5 (38.5%)		
Nationality, n (%)					
Saudi	7 (63.6%)	1 (9.1%)	3 (27.3%)		
Filipino	5 (22.7%)	10 (45.5%)	7 (31.8%)	χ^2=7.00	0.320
Indian	66 (38.2%)	52 (30.1%)	55 (31.8%)		
Other	3 (30.0%)	3 (30.0%)	4 (40.0%)		
Clinical experience, n (%)				χ^2=7.00	0.320
≤5 years	33 (47.1%)	17 (24.3%)	20 (28.6%)		

6–14 years	42 (34.4%)	40 (32.8%)	40 (32.8%)		
≥15 years	6 (25.0%)	9 (37.5%)	9 (37.5%)		
Work shift, n (%)					
Morning	49 (37.4%)	43 (32.8%)	39 (29.8%)		
Afternoon	16 (48.5%)	7 (21.2%)	10 (30.3%)	χ^2=4.31	0.635
Evening	8 (33.3%)	8 (33.3%)	8 (33.3%)		
Rotating	8 (28.6%)	8 (28.6%)	12 (42.9%)		
Posting ward, n (%)					
Emergency	19 (46.3%)	12 (29.3%)	10 (24.4%)		
Surgical	26 (53.1%)	14 (28.6%)	9 (18.4%)		
Medical	14 (22.2%)	23 (36.5%)	26 (41.3%)		
OPD	6 (27.3%)	8 (36.4%)	8 (36.4%)		
ICU	4 (22.2%)	6 (33.3%)	8 (44.4%)	χ^2=24.75	0.132
PHC	1 (33.3%)	0 (0.0%)	2 (66.7%)		
Others	2 (66.7%)	0 (0.0%)	1 (33.3%)		
Pediatric	3 (75.0%)	0 (0.0%)	1 (25.0%)		
Obstetrics/Gynecology	3 (37.5%)	2 (25.0%)	3 (37.5%)		
Laboratory	3 (60.0%)	1 (20.0%)	1 (20.0%)		
Overall health*, n (%)					
≤4	20 (80.0%)	4 (16.0%)	1 (4.0%)		
5–7	28 (65.1%)	9 (20.9%)	6 (14.0%)	χ^2=49.34	**0.000**
8–10	33 (22.3%)	53 (35.8%)	62 (41.9%)		
Presence of a chronic condition**, n (%)					
Yes	21 (25.0%)	55 (65.5%)	8 (9.5%)	χ^2=82.22	**0.000**
No	60 (45.5%)	11 (8.3%)	61 (46.2%)		

Abbreviations: CI, confidence interval; ICU, intensive care unit; OPD, outpatient department; PHC, primary healthcare. Notes: *Measured on a 0-10 rating scale (score of ≤4 indicates poor health; score between 5–7 indicates moderate health; score 8–10 indicates best health). **Conditions such as hypertension, diabetes, neurological, cardiovascular, and any other disease. †One-Way Analysis of Variance followed by post hoc Tukey honestly significant difference.

    Low vs. medium resilient coping levels (Q=5.65; p=0.000)
    Low vs. high resilient coping levels (Q=6.00; p=0.001)
    Medium vs. high resilient coping levels (Q=0.34; p=0.967)
    As shown in Table 3, the ordinal logistic regression model demonstrated significant relationships between resilience coping levels and a few characteristics of nursing professionals. Resilience coping levels showed a positive association with age, indicating the older the age, the higher the resilience coping levels among the nurses (p=0.002). Similarly, nurses posted in an outpatient department (p=0.049), intensive care unit (p=0.032), and laboratory (p=0.052) were found to be significantly more resilient than those posted in other wards. Additionally, coping levels were associated with one's perception of their overall health i.e., nursing professionals who rated their overall health as "best" demonstrated significantly higher coping levels compared to those who were in poor (p=0.000) or moderate overall health (p=0.001) (Table 3).

Table 3. Ordinal logistic regression model for the association between the levels of resilience coping and socio-demographic and other characteristics.

Characteristics	Estimate	SE	Walds χ²	p-value	95% CI
Resilience coping level					
Low	5.896	2.720	4.699	**0.030**	0.565 to 11.228
Medium	7.609	2.739	7.719	**0.005**	2.241 to 12.976
High	0[a]	–	–	–	–
Data mode					
Offline	0.422	0.448	0.885	0.347	-0.457 to 1.300
Online	0[a]	–	–	–	–
Age	0.166	0.055	9.152	**0.002**	0.058 to 0.273
Sex					
Male	-0.361	1.148	0.076	0.783	-2.567 to 1.934
Female	0.062	1.126	0.003	0.956	-2.145 to 2.268
Prefer not to disclose	0[a]	–	–	–	–
Marital status					
Single	2.169	1.608	1.819	0.177	-0.983 to 5.320
Married	1.891	1.558	1.474	0.225	-1.161 to 4.994
Divorced	2.122	1.653	1.649	0.199	-1.117 to 5.361
Widow	0[a]	–	–	–	–
Education					
Diploma in nursing	-1.425	0.826	2.972	0.085	-3.044 to 0.195
Graduate in nursing	-0.793	0.706	1.259	0.262	-2.177 to 0.592
Postgraduation in nursing	0[a]	–	–	–	–
Nationality					
Saudi	-0.826	1.074	0.592	0.442	-2.932 to 1.279
Filipino	-0.692	0.934	0.549	0.459	-2.522 to 1.138
Indian	-0.460	0.817	0.317	0.574	-2.061 to 1.141
Other	0[a]	–	–	–	–
Clinical experience	-0.072	0.055	2.495	0.114	-0.162 to 0.017
Work shift					
Morning	-0.749	0.466	2.586	0.108	-1.661 to 0.164
Afternoon	-0.840	0.612	1.884	0.170	-2.039 to 0.359
Evening	-0.707	0.646	1.197	0.274	-1.973 to 0.559
Rotating	0[a]	–	–	–	–
Posting ward					

Medical	2.159	1.423	2.300	0.129	-0.631 to 4.949
Surgical	2.115	1.384	2.335	0.127	-0.598 to 4.827
Emergency	2.477	1.334	3.449	0.063	-0.137 to 5.091
OPD	2.755	1.398	3.885	**0.049**	0.016 to 5.494
ICU	2.980	1.394	4.573	**0.032**	0.249 to 5.712
Laboratory	3.486	1.798	3.761	0.052	0.037 to 7.010
Obstetrics/Gynecology	2.049	1.856	1.219	0.270	-1.589 to 5.687
Pediatric	1.626	1.780	0.834	0.361	-1.863 to 5.116
PHC	1.711	1.420	1.451	0.228	-1.863 to 5.116
Others	0[a]	–	–	–	–
Overall health*					
≤4	-2.548	0.613	17.270	**0.000**	-3.750 to -1.346
5–7	-1.394	.410	11.582	**0.001**	-2.197 to -0.591
8–10	0[a]	–	–	–	–
Presence of a chronic condition**					
Yes	-0.099	0.415	0.057	0.811	-0.914 to 0.715
No	0[a]	–	–	–	–

Abbreviations: CI, confidence interval; ICU, intensive care unit; OPD, outpatient department; PHC, primary healthcare; SE, standard error. Notes: [a]This parameter is set to zero because it is redundant. Nagelkerke R^2=0.357; parallel-lines assumption verified (p=0.999). *Measured on a 0-10 rating scale (score of ≤4 indicates poor health; score between 5–7 indicates moderate health; score 8–10 indicates best health). **Conditions such as hypertension, diabetes, neurological, cardiovascular, and any other disease.

1.1. Psychometric Properties of BRCS

The parameter of internal consistency (i.e., Cronbach alpha) for the BRCS was 0.80, indicating a good internal consistency. In our scale analysis to obtain Cronbach's alpha, the item-total correlations ranged from 0.56 to 0.73. If any of the four items were deleted, it would cause a decrease in the α-value, highlighting the importance of each of the four BRCS items for the scale's reliability **(Table 4)**. The EFA performed with the total sample (N=216) showed that the results were significant (i.e., χ^2=279.78; df=6; p<0.001) indicating its suitability for factor analysis. The coefficient of the KMO test was 0.74, indicating that the sampling is adequate. Furthermore, the analysis revealed the existence of one factor including all items, which explained 62.33% of the total variance (factor loadings were 0.75 for both BRCS1&2, 0.78 for BRCS3, and 0.88 for BRCS4 items).

Table 4. Psychometric properties of Brief Resilient Coping Scale items.

S. No.	BRCS item	Mean (SD)	Item-Total Correlations	Cronbach's alpha if item deleted
1	I look for creative ways to alter difficult situations	3.64 (1.06)	0.56	0.77
2	Regardless of what happens to me, I believe I can control my reaction to it	3.65 (1.16)	0.59	0.76

| 3 | I believe I can grow in positive ways by dealing with difficult situations | 3.67 (1.17) | 0.56 | 0.77 |
| 4 | I actively look for ways to replace the losses I encounter in life | 3.62 (1.21) | 0.73 | 0.68 |

Abbreviations: BRCS, Brief Resilient Coping Scale; SD, standard deviation.

1. Discussion

To our knowledge, this is the first study to report the resilience coping levels among nursing professionals in Saudi Arabia. Overall, nursing professionals in this study had an intermediate BRCS score, indicating medium resilient coping levels. Most nursing professionals (62.5%) surveyed demonstrated medium to high coping levels. Furthermore, socio-demographic correlates of nursing professionals *viz.,* age, overall health, and posting in certain wards were significantly associated with the resilience coping levels in this population. Finally, BRCS was a psychologically reliable and adequate tool for assessing resilience coping levels in this population.

There has been an upsurge of interest in understanding resilience capacity and the factors affecting the coping levels of nursing professionals [17–19]. The present study was conducted among nursing professionals given their susceptibility to several professional and personal stress factors that adversely affect their health and abilities to manage their job.   Our study revealed that most nursing professionals in Saudi Arabia had moderate to high resilience coping capabilities, consistent with the levels reported among Brazilian nurses [18]. Analysis of the factors influencing coping levels demonstrated age to be positively associated with the levels of resilience (i.e., the older the participants, the greater their resilience coping levels), in alignment with the previous studies [18,19]. In a cross-sectional study that included nursing workers in Brazil (n=375), age and working time were reported as a determinant of resilience [18]. Similarly, a UK-based study that assessed the experiences of nurses working in a respiratory environment during the COVID-19 pandemic reported younger nurses with less experience had higher levels of anxiety and depression and lower resilience [19]. Importantly, the relationship between resilience and age observed in our study contrasts with those reported by some studies [23,24]. A possible explanation of this discrepancy could be attributed to the population, study period, and the setting considered in the present study versus the previously published studies [19,23,24]. The overall health of the nursing professionals was another socio-demographic variable that significantly influenced the resilience levels, i.e., nursing professionals with best overall health demonstrated significantly higher coping levels compared to those with poor or moderate overall health. This finding is similar to a previous study in which students with good perceptions of their health more often showed high resilience than those with regular or poor perceptions [24]. This is quite expected as individuals in the best health state (i.e., physical, and psychological) are more engaged and productive, and tend to be overcome stress more effectively versus those with poor health states [25,26].   With regards to the other variables, nursing professionals posted in an outpatient department, intensive care unit, and laboratory demonstrated significantly higher resilience coping levels than those posted in other wards. The effect of posting in various hospital wards and resilience levels has not been reported in previous studies, therefore, this association needs to be investigated in future studies.

Furthermore, the present study investigated the psychometric properties of BRCS in the nursing population in Saudi Arabia. The internal consistency of the BRCS was good (i.e., Cronbach's alpha was 0.80), which is consistent with the previous studies that reported Cronbach's alpha between 0.59 to 0.86 [16,27–32]. The scale also presented an adequate inter-total correlation (ranging from 0.56 to 0.73), thus, adding to the empirical evidence of the internal consistency of the BRCS in Saudi nursing professionals. Furthermore, the results of EFA substantiate that the one-factor solution was the most acceptable for all the BRCS items, consistent with the findings of previous studies [30,32,33].

A few caveats of this study merit consideration. The cross-sectional design ruled out a causal and longitudinal relationship between resilient coping levels and related indicators. The small

sample size from a single center and convenience sampling add to the bias. Participation in this study was voluntary; therefore, underlying selection bias cannot be ruled out. Moreover, the self-reported nature of the survey may further introduce other potential biases (i.e., false reporting and inaccurate recall). Finally, this study reflects the opinions and experiences of nursing professionals in Saudi Arabia; therefore, findings of this study cannot be generalized to participants from other professions across Saudi Arabia.

Despite the limitations, the current study adds to our understanding of the association between resilient coping levels and socio-demographic characteristics of nursing professionals in Saudi Arabia. Furthermore, this study used a psychometrically validated and reliable BRCS to assess the resilient coping levels, which has been extensively used across several studies.

1. Conclusions

In summary, nursing professionals surveyed in this study demonstrated medium resilient coping levels and calls for devising effective strategies that could enhance their coping levels. Moreover, this study suggests that BRCS is a psychometrically reliable and adequate tool for assessing resilience coping levels and sheds light on the relationship between resilience coping levels and socio-demographic characteristics of the nursing professionals in Saudi Arabia. Further, future studies are warranted to explore the specific concerns and devise adequate strategies to improve the resilience coping levels of the nursing professionals in Saudi Arabia.

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