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Examining factors affecting self-care-self-regulation among registered nurses using path analysis

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Abstract:

BACKGROUND: Practicing self-care is a requisite for nurses as they face the extreme physical, mental, and emotional challenges presented by the pandemic era. This study aimed to examine factors that contribute to self-care-self-regulation (SCSR) and investigate the mediation effect of psychological and physical health in the relationship between work stress and SCSR among registered nurses in the United States.

MATERIALS AND METHODS: This cross-sectional study was conducted on the data collected from 386 registered nurses who completed an online survey over a 3-week period during the COVID-19 pandemic (April 19 to May 6, 2020). The survey assessed demographic and work-related characteristics, work stress, depressive mood, self-rated health, and SCSR. The model was tested with depressive mood as the first mediator and self-rated health as the second mediator. The potential serial mediation effect was analyzed using PROCESS macros adjusting for covariates.

RESULTS: The sequential indirect effect of work stress on SCSR through depressive mood and self-rated health in series was significant, while its direct effect was not.

CONCLUSION: The findings of the path analysis demonstrate that psychological and physical health status is important to promote self-care behaviors when nurses experience high work stress.

Keywords:

Depressive mood, registered nurses, self-care-self-regulation, self-rated health, work stress

Introduction

Although self-care is mandated by the American Nurses Association's (ANA) Code of Ethics,^[1,2] many of them do not prioritize their own self-care.^[3] As per ANA's Healthy Nurse Survey, 70% of nurses reported that they put their patients' health, safety, and wellness before their own.^[4] During the unprecedented public health crisis due to COVID-19 pandemic, frontline nurses work long and exhausting shifts for extended periods and confront the uncertainty and fear and traumatic stress.^[5-7] In this challenging time, nurses could easily neglect self-care for their own wellbeing.

Self-care is defined as a personalized process of promoting overall health and wellbeing, which is both comprehensive and proactive. As per Hricova and Lovas (2018), self-care encompasses a concept of self-regulation, which refers to the "dynamic process of determining a desired end point and then taking action to move toward it while monitoring progress along the way."^[8] (p320) Self-regulation fosters an increased ability to care for oneself and others by employing various strategies in both personal and professional settings to prioritize self-care and have the necessary full capacity to truly care for others.^[3] Nurses can use self-regulation as a self-care strategy to lessen their vulnerability to caregiving fatigue and to improve their wellbeing and resilience.^[9] When nurses engage in

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self-care-self-regulation (SCSR), they are equipped to handle daily stress, improve patient care, and enhance their own wellbeing.^[10]

Self-care among nurses is affected by various factors. Shift work and long work hours were linked to unfavorable health behaviors, including smoking, alcohol consumption, and physical inactivity.^[11] Greater stress was specifically related to unhealthy behavior, such as irregular meal patterns and disordered eating.^[12,13] Work stress can also affect psychological and physical health. Burnout and traumatic stress have been significantly linked to higher depression levels.^[14,15] These psychological symptoms can, in turn, lead to manifestation of physical symptoms and poor self-rated health.^[16,17] In patients with chronic illness, depression and physical health has been considered as a significant influencing factor of self-care and self-care-self-efficacy such that these factors play a role in reducing belief in themselves for self-care and in preventing them from adhering to self-care behaviors.^[18-21] Given that the presence of depressive symptoms and compromised health can limit self-efficacy and the ability for individuals to deal with self-care behaviors, it is plausible that the psychological and physical health factors may also be associated with self-regulation related to self-care among nurses.

The increasingly complex work environments for nurses juggling multiple roles and responsibilities make it difficult for nurses to attend to self-care^[22,23] and it has been even more challenging during the prolonged pandemic period. Despite the importance of self-care among nurses, research in this area is limited. There are a few studies presenting barriers to self-care in nurses;^[24] yet, little research covers intrinsic factors that pose barriers to nurse's health-promoting self-care from a self-regulation perspective. Particularly, it is little known how nurses are taking care of themselves during the pandemic. Better understanding how psychological factors, such as work stress and depression, and physical health are related to their SCSR and self-care behaviors will be informative to support healthcare workers to not compromise their own wellbeing while committing to caring for their patients.

The present study, therefore, aimed to investigate associations among work stress, depressive mood, physical health, and SCSR and to explore self-care behaviors and perceived barriers among registered nurses (RNs). In terms of the associations, we tested the following hypotheses: (1) higher work stress will be associated with higher depressive mood; (2) higher depressive mood will be associated with lower self-rated health; (3) lower self-rated health will be associated with lower SCSR; and (4) work stress will

indirectly be related to SCSR through depressive mood and self-rated health among the RNs. In addition, the study sought to explore work stress, barriers, and plans of health promoting self-care practices for the exploration of health promotion strategies. This study provided unique snapshots of mental health and self-care practices during the unexpected start of the COVID-19 pandemic.

Materials and Methods

Study design and setting

This descriptive, correlational study was conducted at a public state university in the southeastern United States. After obtaining the approval of the university's Institutional Review Board, Qualtrics, a secure online survey platform was used to collect survey responses anonymously. The online survey was conducted over a 3-week period during the COVID-19 pandemic (April 19 to May 6, 2020).

Study participant and sampling

E-mail invitations to the online survey were sent to RNs enrolled in postlicensure programs (including the RN-BSN, MSN, or DNP programs) through the Institution's Student Center. Three reminder e-mails were sent out to prompt responses. All e-mails contained the researcher's contact information and explained the voluntary nature of the survey. Of 2,756 eligible RNs invited, 391 (14.2%) completed the survey.

Data collection and techniques

The survey included questions on demographic and work-related characteristics, self-rated health, depressive mood, work stress, SCSR, and three open-ended questions on additional work-related stress and barriers to plans of practicing self-care.

Demographic and work-related characteristics.

The demographic and work-related data included age, gender, race/ethnicity, years of work as an RN, work shift, full-time or part-time, primary work position (staff nurse, charge nurse, etc.), and highest level of education (diploma, associated, bachelor's, master's). Gender (male vs. female), race/ethnicity (Caucasian vs. non-Caucasian), work shift (day shift vs. non-day shift), full time (yes vs. no), and primary position (staff nurse vs. nonstaff nurse) were treated as dichotomous variables while the remaining as continuous in the data analysis.

Work stress. Work stress was assessed using 8 items selected from the Nursing Stress Scale (NSS). While the original NSS consists of 34 items with 7 subscales describing situations identified as work stressors for nurses,^[25] the present study included only 8 items that

were representative items from the remaining 6 subscales: 1) shift hours, 2) conflict with other nurses, 3) conflict with physicians, 4) conflict with other health professionals, 5) lack of support, 6) inadequate preparation of care, 7) meeting the needs, and 8) workplace bullies. The NSS subscale items relating to “death and dying” were not included because of the nature of the present study. The scale asked respondents how often they found the situations to be stressful. Response categories were 0 (never) to 3 (very frequently).^[25] The total score, ranging from 0-24, is calculated by summing the scores of the 8 items. Cronbach’s alpha of the current 8-item questionnaire was 0.79, while the original 34 items was 0.89.^[25]

Depressive mood. Depressive mood was assessed using the 2 items of Patient Health Questionnaire-2, which was used as a brief screening for depression.^[26] Each item has a 4-point Likert scale from 0 (not at all) to 3 (nearly every day). The total score, ranging from 0-6, is calculated by summing the scores of the 2 items. The score of 3 is considered the optimal cut point when used to screen for depression.^[26]

Self-rated health. Overall perceived health was measured by a single question to rate their own health as poor (=0), fair (=1), good (=2), and excellent (=3). This self-rated health is a valid and reliable measure among those without cognitive impairment.^[27]

Self-care-self-regulation. SCSR was assessed using the selected 20 items from the 32-item SCSR questionnaire.^[28] This questionnaire was selected because it reflects the duties of nurses identified by the ANA Code of Ethics. These duties include the responsibility to promote health and safety, preserve wholeness of character and integrity, maintain competence, and continue personal and professional growth.^[1] The questionnaire measures self-care regarding personal growth, control over negative moods, physical self-care, and control over health risks. Items were rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The total score, ranging from 20-100, was calculated by summing the scores of the 20 items. While the original 32-item SCSR included unbalanced numbers of 14, 9, 4, and 5 items for each subscale, the modified version used a more balanced and less repetitive mix of 6, 6, 4, and 4 items for each subscale. Cronbach’s alpha of the current 20-item SCSR questionnaire was 0.90, while the original 32-item questionnaire was Cronbach’s alpha of 0.89. The reliabilities of the subscales were very similar to those in the original scale: 0.88 (personal growth), 0.87 (physical self-care), 0.78 (control over negative mood), and 0.65 (control over health risks).

Open-ended questions. To explore additional work-related stress, barriers, and plans to practice self-care, the following three questions were asked: 1) If you are experiencing other sources of work stress, please state; 2) Please list any barriers that stop you from maintaining healthy self-care habits; and 3) Please list any self-care practices you plan to use to promote your health.

Ethical consideration

The research protocol was approved by the university’s Institutional Review Board (UNCW 20-0204) and all respondents provided a written informed consent.

Data analysis

Descriptive statistics were calculated for means (with standard deviation [SD]) and frequency (with percentages). Pearson’s correlations were used to assess bivariate associations among the variables of interest. Path analysis was conducted to test the mediation effect of depressive mood and self-rated health on the relationship between work stress and SCSR using the PROCESS macros by Hayes.^[29] The 95% confidence intervals (CIs) for indirect effects were calculated based on a bootstrap procedure of 5,000 repetitions. All data analyses were performed using SPSS Statistics 27, and the significant level was $P < .05$.

Results

Descriptive results

Of the 391 (14.2%) who completed the survey, 386 cases were analyzed due to missing data. The mean age of participants was 38 years and the mean years of experience as an RN was 9 years [Table 1]. The majority were female (94.7%), Caucasian (84.9%), working full-time (83.6%), and exclusively working the day shift (63.7%). The most common primary position was staff nursing (62.3%). The most common highest degree of education completed was an associate degree (51.9%), followed by a bachelor’s degree (41.7%). The average score for work stress was 10.75 (SD = 4.90) in a score range of 0 to 24. The average score for depressive mood was 1.27 (SD = 1.37) in a score range of 0 to 6. The average score for self-rated health was 2.92 (SD = 0.65) in a score range of 1 to 4. The majority (62.4%) rated their health as “good” and 21.8% reported as “poor” or “fair.” The average score for SCSR was 81.37 (SD = 9.33) in a score range of 20 to 100.

Based on the Pearson’s correlation analysis shown in Table 2, work stress was positively correlated with depressive mood ($r = .291, P < .001$) and negatively correlated with self-rated health and with SCSR ($r = -.240, P < .001; r = -.194, P < .001$). The level of depressive

Table 1: Demographic characteristics of participants

Variable	Frequency (%)	Range	Mean (SD)
Age (years)		19-65	37.55 (10.17)
Number of years as an RN (years)		0.5-43	9.14 (8.50)
Gender			
Male	20 (5.3)		
Female	360 (94.7)		
Race/Ethnicity			
Caucasian	325 (84.9)		
Non-Caucasian including	58 (15.1)		
African American	34 (8.9)		
Asian	5 (1.3)		
Hispanic	13 (3.4)		
Other	6 (1.6)		
Work			
Full time	316 (83.6)		
Part time	62 (16.4)		
Work shift			
Day shift	242 (63.7)		
Non-Day shift including:	138 (36.3)		
Evening shift	19 (5.0)		
Night shift	86 (22.6)		
Rotating shift	33 (8.7)		
Primary Position			
Staff Nurse	226 (62.3)		
Non-Staff Nurse including:	136 (37.7)		
Charge Nurse	54 (15.0)		
Nurse Manager	19 (5.3)		
Other	63 (17.5)		
Highest Level of Education			
Diploma	11 (3.0)		
Associate degree	188 (51.9)		
Bachelor's Degree	151 (41.7)		
Master's Degree	12 (3.3)		
Work stress		0-23	10.75 (4.90)
Patient Health Questionnaire-2 (PHQ-2)		0-6	1.27 (1.37)
Little interest or pleasure in doing Things over the last two weeks (item1)			
Not at all	188 (49.3)		
Several days	143 (37.5)		
More than half the days	41 (10.8)		
Nearly everyday	9 (2.4)		
Feeling down, depressed or hopeless over the last two weeks (PHQ-2)			
Not at all	197 (51.4)		
Several days	152 (39.7)		
More than half the days	24 (6.3)		
Nearly everyday	10 (2.6)		
Perceived physical health		1-4	2.92 (0.65)
Poor	6 (1.7)		
Fair	73 (20.2)		
Good	226 (62.4)		
Excellent	57 (15.7)		
Self-care-self-regulation		20-100	81.37 (9.33)

n=386 (Because of missing data, the total was not 386 for each item.)

mood was negatively correlated with self-rated health and SCSR ($r = -.260, P < .001$; $r = -.394, P < .001$).

Finally, self-rated health was positively associated with SCSR ($r = .445, P < .001$).

Mediation analysis

Table 3 presents total, direct and indirect effects of the hypothesized model, adjusting for age, gender, race, years of work as an RN, work shift, full or part time, primary work position, and highest level of education. Direct effects are displayed in Figure 1. First of all, work stress was positively associated with depressive mood ($B = 0.08, P < .001$), which supports the hypothesis 1. Second, depressive mood was negatively associated with self-rated health ($B = -0.09, P = .003$), which supports the hypothesis 2. Third, self-rated health was positively associated with SCSR ($B = 5.37, P < .001$), consistent with the hypothesis 3. Finally, in line with the hypothesis 4, the sequential indirect effect of work stress on SCSR through depressive mood and self-rated health in series was significant ($B = -0.03, 95\% \text{ CI} = -0.07, -0.01$). The total effect of work stress on SCSR was negatively significant; yet, work stress did not have a significant direct effect on the outcome. In addition, there was a negative indirect

effect of work stress on SCSR via depressive mood ($B = -0.15, 95\% \text{ CI} = -0.23, -0.08$) and self-rated health ($B = -0.11, 95\% \text{ CI} = -0.20, -0.02$), respectively. Overall, the association between work stress and SCSR is fully mediated by depressive mood and self-rated health.

Open-ended question analysis

Work Stress, Barriers, and Plans of Self-Care Practices. In response to the following open-ended question: “If you are experiencing other sources of work stress, please state,” 93 among 153 respondents reported COVID-19 challenges: PPE concerns (reuse of N95s and other masks), adapting to COVID-19 demands regarding changes in policy and job role changes, extra work, and fear of potential exposure. The remaining 60 responses included short staffing but required high acuity, job transition, managing school, family work, life, and poor communication. As for any barriers that prevented them from maintaining healthy self-care habits [Table 4], the most frequently reported barrier was the lack of time ($n = 154, 49.5\%$), followed by mental or physical health issues ($n = 88, 28.3\%$), lack of self-regulation ($n = 62, 19.9\%$), and family responsibilities ($n = 46, 14.8\%$). Finally, 292 reported self-care practices they planned to use to promote their health [Table 5]. The most mentioned self-care plans focused on physical activity ($n = 301$), followed by emotional and spiritual wellbeing ($n = 150$),

Table 2: Correlations among variables of interest

Variable	1	2	3	4
Work stress	1			
Depressive mood	0.291**	1		
Self-rated health	-0.240**	-0.260**	1	
Self-care self-regulation	-0.194**	-0.394**	0.445**	1

** $P < .001$

Table 3: Total, direct, and indirect effects of the mediation model

Variable	Unstandardized Coefficient	SE	P	95% CI
Total effect				
WS→SCSR	-0.33	0.10	0.001	-0.53, -0.13
Direct effect				
WS→SCSR	-0.05	0.10	0.657	-0.24, 0.15
WS→DM	0.08	0.01	<0.001	0.05, 0.10
WS→SRH	-0.02	0.01	0.012	-0.04, -0.01
DM→SCSR	-1.97	0.38	<0.001	-2.72, -1.22
DM→SRH	-0.09	0.03	0.003	-0.14, -0.03
SRH→SCSR	5.37	0.77	<0.001	3.85, 6.89
Indirect effect				
WS→DM→SCSR	-0.15	0.04		-0.23, -0.08
WS→SRH→SCSR	-0.11	0.05		-0.20, -0.02
WS→DM→SRH→SCSR	-0.03	0.01		-0.07, -0.01

Age, gender, race, years of work as an RN, work shift, full or part time, primary work position, and highest level of education were controlled for; WS=Work stress; DS=Depressive mood; SRH=Self-rated health; SCSR=Self-care self-regulation

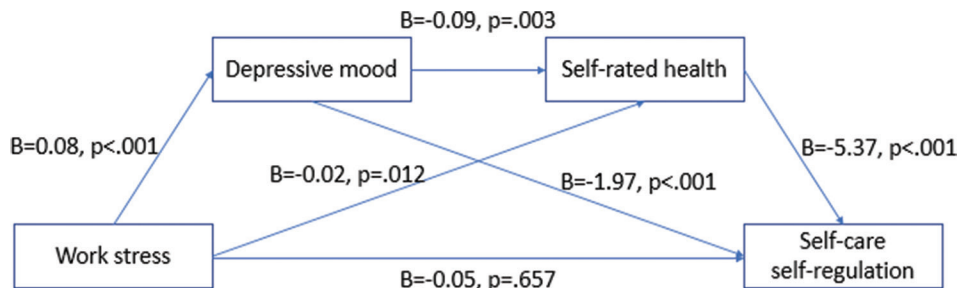


Figure 1: Direct effects of the hypothesized model

Table 4: Reported barriers of self-care practices

	Barriers	Frequency (%)	Total (%)		
Time	Lack of time/busyness	78 (25.1)	154 (49.5)		
	Work schedule/shift/load	44 (14.1)			
	School work	32 (10.3)			
Health	Stress/fatigue/exhaustion	53 (17.0)	88 (28.3)		
	Poor mental health	23 (7.4)			
	Depression (12)				
	Anxiety (9)				
	PTSD (1)				
	Low self-esteem (1)				
Self-Regulation	Pain/(chronic) illness	12 (3.9)	62 (19.9)		
	Lack of motivation/laziness (37)	37 (11.9)			
	Unhealthy cooking and eating habit/stress eating	25 (8.0)			
Family	Parental responsibilities	31 (10.0)	46 (14.8)		
	Family issues/responsibilities	15 (4.8)			
Others	Not making myself a priority/No time for myself	21 (6.8)	21 (6.8)		
	Care too much others				
	Desk job more sedentary than before				
	Lack of money/finances				
	No healthy food there to eat at work				
	Don't know how to stop				
	Lack of willpower				
	Procrastination				
	None	No barrier		14	(4.5)

Number of factors reported varied among respondents

health protection and promotion (n = 97), and hobbies/leisure (n = 61).

Discussion

The present study provides a snapshot of RNs' work stress, depressive mood, self-rated health, and SCSR during the COVID-19 pandemic. It is noted that high work stress negatively affects nurses' SCSR through depressive mood and physical health. This finding suggests that high workload and intense demands may compromise nurses' psychological and physical health, which are in turn likely to render low self-regulatory capacity for self-care behaviors. Although there may be bidirectional associations of SCSR with depressive mood and self-rated health, the findings are consistent with a previous study that reported depression as a factor that reduces a nurses' motivation in health-promoting activities.^[30] Our findings further added more knowledge that self-rated health also plays a part in the relationship between work stress and SCSR. The indirect effect of work stress through psychological and physical health on nurses' self-care has an important implication that appropriate supports for nurses are required to break the course of high work stress, particularly in high-demanding work environment. This information can also be used for stratification to identify nurses who are at a high risk of lower levels of SCSR.

Overall, the average score of SCSR reflects that most respondents agree that they try to engage in

self-care behaviors, including weight management, regular physical activity, healthy diets, and good sleep. Although these findings imply that nurses acknowledge the importance of health-promoting activities, whether their knowledge translates into actual self-care promotion behaviors is not evident.^[31] There is scarce research assessing nurses' participation in health-promoting behaviors. One study showed that of 3,132 hospital-based RNs, only 50% met the physical activity guidelines suggested by the Centers for Disease Control and Preventions and 625 (20%) consumed fast food at least twice weekly.^[32] Organizational efforts, such as employee wellness benefit programs, have been made to promote health-promoting behaviors among nurses.^[33] Subsequent research demonstrating the benefits of these programs and actual rates of nurses' health-promoting behaviors is suggested. The present study demonstrates that depressive mood and poorer health may counteract SCSR.

The open-ended question on other sources of work stress in the present study revealed the consistent evidence that most respondents were experiencing stress from the COVID-19 pandemic. The lack of time, support, and resources have often been reported as extrinsic barriers to healthy behaviors in nurses.^[24,34,35] The lack of time/busyness was also the most commonly experienced barrier to practicing self-care among nurses in this study. These findings suggest that interventions to promote self-care should be less time-intensive and

Table 5: Reported plan for self-care practices

	Plan	Frequency (%)	Total (%)
Physical Activity	Exercise/workout	116 (39.7)	301 (103)
	Healthy cooking/eating	95 (32.5)	
	Walking (50)/Jogging/running (12)	62 (11.6)	
	Increased Physical activities	28 (9.6)	
Health Protection and Promotion	Health protection	16 (5.5)	97 (44.1)
	Less alcohol (2)		
	No use of drugs (2)		
	Hygiene/sanitation (7)		
	Rest/good take care my body (5)		
	Health/medical care	5 (1.7)	
	Take my medication as directed (3)		
	Regular checkups (1)		
	Frequent doctor's visits (1)		
	Supplements (e.g., vitamins, probiotics)	16 (5.5)	
	Gym/wellness plan/self-monitoring app	10 (3.5)	
	Quality sleep	34 (11.6)	
	Weight control/loss	16 (5.5)	
	Yoga	27 (9.2)	
Emotional and Spiritual Well-being	"Me" time (Personal time to myself)	20 (6.8)	150 (51.4)
	Meditation/mindfulness	19 (6.5)	
	Relaxation (e.g., SPA, massage, essential oils, skin care)	20 (6.8)	
	Spending time with family/friends	17 (5.8)	
	Self-Regulation	25 (8.6)	
	Deep breathing (6)		
	Prioritizing/organizing daily to do lists (5)		
	Trying to remain positive (3)		
	Daily motivation (3)		
	Limiting my social media use (2)		
	Getting rid of clutter (2)		
	Positive self-talk (1)		
	Avoiding confrontations/negative people (1)		
	Journaling (1)		
	Balanced life (1)		
	Therapy: (Psy.) therapy (4), Light therapy (1), & Aromatherapy (1)	6 (2.1)	
	Religious Activities: Prayer (10), Bible reading/study (4), Church attendance/small group (2)	16 (5.5)	
	Hobbies/Leisure	Outdoor activities	
Nature walk/outdoor/fresh air/vacation		23 (7.8)	
Hobbies/reading/gardening		18 (6.2)	

Respondents ($n=292$) listed multiple plans to improve their health. Number of plans reported varied among respondents

more convenient, while also matching nurses' needs. Considering that the most commonly reported plan to improve health was physical activity, interventions focusing on improving physical activity in workplaces can be considered as an effective strategy supporting their plan, simultaneously overcoming the barrier of lack of time. As per ANA's Healthy Nurse Survey, 47% of nurses reported not having access to employer-based exercise facilities and programs (24%, disagree and 23%, strongly disagree).^[4] Advocacy and expansion of workplace exercise programs may support nurses' endeavors in health promotion.

The present study has several limitations. First, due to the cross-sectional design, only correlational associations can

be identified. Second, the use of convenience sampling produced the homogeneous sample (predominantly Caucasian females) which limits the generalizability of the results to a larger population. Although we found the number of respondents were well beyond the required sample size derived from a power analysis, the low response rate might have been a source of bias. Third, the self-reported data might have brought social desirability bias for nurses related to expectation that they model healthy behaviors. Fourth, to reduce the total number of items in the online survey, the authors used shortened versions of NSS and SCSRC. Although the reliability of the shortened versions was established, the validity of the revised ones was not tested. Finally, SCSR would not necessarily be the same as actual carrying out the

behaviors. However, given that self-regulation capacity may precede behaviors, it is meaningful to assess SCSR as a predisposing factor of self-care behaviors.

Conclusion

The findings of this study highlight that work stress contribute to the level of SCSR indirectly through its effect on depression and self-rated health. ANA nurse duties mandate self-care for nurses' overall wellbeing and for the effectiveness of patient care.^[1] In this study, the respondents, in general, agreed that they were trying to engage in SCSR. Future studies are suggested to assess actual implementations of health-promoting behaviors among nurses. The study findings also call for closer attention to healthcare workers who are working in intensely demanding work environment related to the COVID-19 pandemic and supports for their mental and physical health to increase their SCSR. Furthermore, the information on both barriers and preferences to self-care from this study would help direct strategies that can be incorporated in nursing workplaces to increase health-promoting behaviors among nurses.

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Abbreviations

SCSR, self-care-self-regulation; ANA, American Nurses Association; HNS, Healthy Nurse Survey; NSS, Nursing Stress Scale; RN, Registered Nurse.

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Conflicts of interest

There are no conflicts of interest.

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