How to Know if You're Really There

An Evaluation of Measures for Presenteeism in Nursing

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Objectives: To report presenteeism prevalence across presenteeism measures from the work-stress and sickness domains. To evaluate the psychometric fit of those measures in a nursing population. **Methods:** Cross-sectional descriptive survey of 447 US RNs using five reliable and validated measures of presenteeism: Stanford Presenteeism Scale (SPS), Job-Stress-Related Presenteesim Scale (JSRPS), Healthcare Productivity Scale (HPS), Nurses Work Functioning Questionnaire (NWFQ), and Health and Work Questionnaire (HWQ). The survey was evaluated using descriptive, exploratory, and confirmatory factor analysis. **Results:** Mean rates among nurses (SPS = 19.50, JSRPS = 2.1, HPS = –15.1, NWFQ = 17.0, and HWQ = 6.7) were higher than previously published and spanned both job-stress and sickness domains of presenteeism. We identified different factor structures than previously published for three of the five instruments. **Conclusion:** An inclusive conceptualization of presenteeism that includes work-stress and sickness domains is crucial to developing future measures and interventions for presenteeism.

Keywords: job stress presenteeism, nurses, presenteeism, registered nurses, sickness presenteeism

Approximately $150 billion is lost in the US economy annually due to presenteeism.[1] Presenteeism is defined as when you are present at work, but you are not fully performing or engaged,[2] which can occur as a result of many factors (eg, chronic illness, workplace stress, and work-life imbalance). Presenteeism is often defined and measured based on one of these specific sources. For example, Cooper and Dewe[3] defined presenteeism as ''lost productivity that occurs when employees come to work ill and perform below par because of that illness'' (p. 522); whereas, Gilbreath and Karimi[4] defined presenteeism as ''when employees are physically present, but mentally absent'' (p. 120).

Throughout the literature, presenteeism is associated with consequences beyond decrements in worker performance, such as effects on employee health and wellbeing.[5] As a result, addressing presenteeism has been a focus of research by occupational health and business scholars since the 1970s.[6,7] However, variation in conceptualization and definition of presenteeism has created siloed streams of presenteeism research. There are researchers who focus on sickness presenteeism, while others focus on job-stress-related presenteeism. Scholars in each of these areas have developed measures, conceptual models, and interventions to address their scope of presenteeism.

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The parallel development of these streams of research has led to increased understanding of different causes of presenteeism, but a lack of understanding of the whole picture of presenteeism. A broader and more holistic conceptualization and measurement of presenteeism is necessary to address the inherent relationships between these two scopes. For example, individuals can develop illnesses as a result of working in stressful work environments.[8] In these presenteeism cases, is it the illness and/or the stressful work environment that is leading to the individual's presenteeism? Without considering the relationships between different scopes of presenteeism research, we may fail to account for the root cause and fail to design interventions that will address the multiple related factors that may lead to presenteeism for an individual. The first step toward joining these scopes of presenteeism research is conceptualizing and measuring presenteeism in a way that is comprehensive. Therefore, we chose to study and measure presenteeism using a broader conceptualization lacking in previous literature. We chose to conduct this study of presenteeism in the nursing population due to the prevalence of presenteeism in nursing, the consequences of presenteeism, and the differences in conceptualization and measurement of presenteeism within prior studies of this population of workers.

When compared with 41 other work sectors, nurses have been identified as having the highest rates of presenteeism.[9] There are multiple risk factors inherent in nursing work that may contribute to these high rates, including the healthcare work environment, suboptimal health, and professional identity as a caregiver.[2,6,7] Sixty-one percent of nurses in the United States work in hospital settings.[10] The Occupational Safety and Health Administration has declared hospitals as one of the most hazardous places to work due to the unique risks and culture.[11] The physical, mental, and emotional demands of hospital nursing are linked to poor health outcomes for nurses, high incidence of workplace injuries, and increased nurse turnover rates.[12,13] These hospital work demands are often coupled with suboptimal health. Over half of nurses report suboptimal physical and mental health.[14] However, nurses attend work when ill more frequently than other professionals. Nurses had a lower median number of days away from work as a result of musculoskeletal disorders (nine in comparison to 12),[15] and eight out of 10 nurses state that they frequently work while in pain.[12] This is often attributed to the dedication nurses feel toward their patients and coworkers. Nurses often put the needs of patients and coworkers above their own health and wellbeing.[17] This dedication has been described as a nurse's desire to be a super nurse with heroic abilities to care for others regardless of impact on themselves.[16,17] The hospital work environment, suboptimal health, and this heroic professional identity are all prevalent risk factors for presenteeism in nursing that need to be considered in the conceptualization and measurement of presenteeism.[2]

Consequences of presenteeism among nurses include negative consequences for patients (eg, medication errors), healthcare organizations (eg, increased costs), and nurse wellbeing (eg, depression).[8,18,19] Presenteeism has been linked to omission of nursing care tasks and missed care,[20] as well as patient falls and medication error.[18] Nurse health consequences have also been identified, including increased risk for anxiety and depression.[8] These negative consequences can affect health care costs for society and healthcare

organizations. One study looked at presenteeism resulting from back pain and depression and estimated the cost of presenteeism to be $14,339 per nurse annually in the United States.[18] These studies[8,18–20] of nurse presenteeism consequences all measured presenteeism through different self-report measures. Conceptualization and measurement of presenteeism that is inclusive of more than one risk factor will provide a fuller picture of the true consequences of presenteeism in the nursing workforce.

There are multiple measures of worker performance that have been used to measure presenteeism; however, these are all retrospective self-report.[7,21,22] There are three current limitations with current presenteeism measurement: (a) industry-specific items, (b) focus on either sickness or job-stress presenteeism, and (c) different approaches to measuring presenteeism. Many measures have been developed and tested for use in specific industries, which means some items are particular to industry-specific tasks (eg, performance in lifting items greater than 10 pounds).[23] Some of these tasks are not transferrable to a nursing context, and items should be considered prior to use in this population.

A second existing measurement limitation is the focus of existing measures on one specific type of presenteeism. The majority of measures assess presenteeism related to only one specific risk factor, for example, sickness or stress.[4,24] Researchers who study presenteeism resulting from sickness have often utilized scales that ask respondents to describe how their specific medical condition impacted their work performance.[25–27] These instruments have been shown to be reliable and valid, but do not take into account other known risk factors for presenteeism beyond sickness. The same measurement limitations apply to the measures developed in the job-stress-related presenteeism research scope. Therefore, measures from both areas only measure a subset of presenteeism occurrence.

A third measurement limitation is that presenteeism is a latent concept, so measurement is difficult. Scholars often approach measuring presenteeism through assessing other related concepts to triangulate the occurrence of presenteeism. Two tactics used are assessing the prevalence of both signs (eg, I am unable to concentrate on my job due to work stress) and consequences of presenteeism (eg, How often did you almost cause an incident at work?). These different tactics mean that instruments to measure presenteeism vary greatly in approach, subscales, and items. The different conceptualizations and measures only further limit the ability to compare prevalence across studies and populations. To fit a broader conceptualization of presenteeism, measurement must straddle different industries, domains, and approaches. Specific and nonspecific worker population instruments that study both sickness and job-stress presenteeism and utilize different tactics should be used.

To address the variations in conceptualization and measurement, we propose a holistic conceptualization of presenteeism that is inclusive of the multiple factors that have been linked to presenteeism within the nursing population. We define presenteeism as physical presence at work when not fully engaged or functioning. To measure this conceptualization, we utilized a survey of hospital registered nurses (RNs) with five different reliable and validated presenteeism measures. The selected instruments measure presenteeism across industries and domains of presenteeism and utilize different measurement approaches. The research objectives were to (1) measure presenteeism prevalence across five measures in the nursing population and (2) evaluate the psychometric fit and utility of those five measures of presenteeism for use in nursing.

METHODS

Data and Sample

This study used a cross-sectional survey design to measure and conduct psychometric testing on measures of presenteeism sourced from available literature. All of these measures have been utilized previously to study presenteeism in nursing and/or other populations. In order to test the psychometrics of each instrument in its entirety, participants completed all of each measure. The survey was conducted online via Qualtrics.[28] The survey included five measures of presenteeism (111 items), eight measures of presenteeism risk factors and consequences (124 items), and demographic questions (18 items). The median response time to complete the survey was 32 minutes. This study was deemed exempt by the University of Wisconsin-Madison Health Sciences IRB. Data were collected from August of 2017 through February of 2018.

We targeted a sample size of greater than 300, as recommended by Myers et al,[29] for confirmatory factor analysis, which was in the recommended rules of thumb range of five to 10 participants per item on the largest scale (50 items in this case), or between 250 and 500 participants. Participants were recruited through listservs of nursing organizations, nursing school alumni groups and hospital organizations, advertisements in nursing organization newsletters, and on social media posts. Potential participants completed three screening questions for inclusion criteria: (1) Are you a registered nurse? (2) Do you work on an inpatient hospital unit? and (3) In that role, do you provide direct patient care? If a participant responded yes to all three questions, a description of the study and consent screen appeared. Participants who did not answer yes to all three questions were thanked for their interest in participating, but excluded from participating. Participants had to select consent to participate before beginning the survey. Participants had the option of providing an email address to enter a raffle for Amazon gift cards, with additional gift cards raffled off to those who completed the survey in its entirety. Participant email addresses were stored separately from the rest of survey responses. All other survey questions were anonymous.

STUDY MEASURES

We selected five validated and reliable measures of presenteeism identified through a literature search completed as a part of a concept analysis of presenteeism in nursing.[2] All of these measures have been used to measure presenteeism in prior studies, even though some of the measures were originally developed to assess related concepts.[21,30] Four out of the five measures have been used in a nursing population, but only one of the measures, the Healthcare Productivity Scale,[31] has been used in the nursing population in the United States. The fifth measure, the Health and Work Questionnaire,[32] was identified as having strong evidence to support its use in multiple presenteeism measurement reviews and in studies comparing it to objective measures of productivity.[33] The selected measures encompass the sickness and job-stress-related presenteeism domains and utilize different approaches to measure presenteesim. These diverse measures were chosen to align with our broader conceptualization of presenteeism.

Stanford Presenteeism Scale (SPS-6)

The SPS-6[24] is a widely used reliable and validated scale for assessing the impact of health problems on work performance and productivity among nurses and other employee groups.[8,34] The published Cronbach α of this scale for the total score is 0.80.[24] This scale is six items long, with a 5-point response scale ranging from strongly disagree to strongly agree. Three items are reverse scored. There is a two-factor structure, with one factor on completing work (items 2, 5, and 6) and the second factor on avoiding distraction (items 1, 3, and 4). A higher total summative score indicates better performance despite a health condition. A sample of 148 nurses in Croatia had a mean score of 21.3 (SD = 4.58) on the SPS-6[35]; a sample of 229 nurses in Italy had a mean score of 20.9 (SD = 3.5)[36]; and 126 nurses in Portugal had a mean score of 24.0 (SD = 7.1).[8]

Health and Work Questionnaire (HWQ)

The HWQ[32] is a scale for measuring workplace productivity and workplace health that has been used to measure presenteeism in prior studies.[30,33] The questionnaire is made up of six subscales: productivity (items 12–16) (Published Cronbach $\alpha = 0.96$); concentration/focus (items 20–24) (Published Cronbach $\alpha = 0.87$); supervisor relations (items 8 and 10) (Published Cronbach $\alpha = 0.85$); non-work satisfaction (items 4, 5, and 11) (Published Cronbach $\alpha = 0.86$); work satisfaction (items 2, 3, 6, and 7) (Published Cronbach $\alpha = 0.84$); and impatience/irritability (items 17–19) (Published Cronbach $\alpha = 0.72$).[32] This questionnaire is composed of 24 items with six different 1 to 10 response scales (very dissatisfied to very satisfied, not rewarding at all to very rewarding, no control at all to total control, not at all easy to very easy, my worst ever to my best possible, never to almost always). Three of the items (12 to 14) all had three parts. Eight items are reverse scored. Means are calculated for each subscale and total score. A higher score indicates less presenteeism. The HWQ has not been used in a nursing population, but in a population of airline agents, the mean scale score reported was 7.7 (total score standard deviation not reported).[32]

Nurses Work Functioning Questionnaire (NWFQ)

The NWFQ[37] is a measure developed to assess presenteeism due to health conditions among nurses and allied health professionals. The questionnaire is composed of seven subscales: cognitive aspects of task execution and general incidents (items 1–7, 9, 15, and 16; published Cronbach $\alpha = 0.94$); impaired decision making (items 48–50; published Cronbach $\alpha = 0.88$); causing incidents at work (items 14 and 26–32; published Cronbach $\alpha = 0.78$); avoidance behavior (items 36–43; published Cronbach $\alpha = 0.70$); conflicts and irritations with colleagues (items 33–35 and 44–47; published Cronbach $\alpha = 0.77$); impaired contact with patients and their family (items 10–13 and 22–25; published Cronbach $\alpha = 0.81$); and lack of energy and motivation (items 17–21; published Cronbach $\alpha = 0.81$).[37] The scale is composed of 50 items, with four 1 to 7 point (no difficulty to great difficulty, totally disagree to totally agree, almost never to almost always, not once to on average more than 1 time per day) and two 5-point response scales (almost never to almost always, disagree to agree). The three items (48–50) on the impaired decision-making subscale are reverse scored and not appropriate for use in allied health professional populations. Standardized sum scores are calculated for the subscales and total questionnaire, with higher scores indicating greater presenteeism due to health conditions. Scores range from 0 to 100. Nurses and allied health professionals in the Netherlands had a median score of 11 across six domains (without the impaired decision-making subscale).[38]

Health Productivity Scale (HPS)

The HPS[39] is a scale developed to measure the extent to which workplace violence impacts a provider's performance at work. The scale has 29 items, with a response scale ranging from −2 to +2 (decreased productivity to increased productivity). The published Cronbach α for the scale is 0.97.[39] This scale has a four-factor structure: (1) cognitive demands (items 1–4 and 11; published Cronbach $\alpha = 0.87$), (2) handle/manage workload (items 5–10; published Cronbach $\alpha = 0.90$), (3) support and communication with patients and visitors (items 12–17; published Cronbach $\alpha = 0.93$), and (4) safety and competency (items 18–27; published Cronbach $\alpha = 0.95$).[39] Items 28 and 29 are not part of a factor. A summative total score is calculated, with scores less than 0 meaning performance is impacted and there is presenteeism. A prior study using this scale among emergency room nurses in the United States found a mean of −0.05 (SD = 14.3).[31]

Job-Stress-Related Presenteeism Scale (JSRPS)

The JSRPS[4] is a reliable and validated measure of presenteeism. Gilbreath and Karimi[4] defined presenteeism as cognitive energy diverted due to job stress. The published Cronbach α of this scale is 0.91.[4] The scale is composed of six items, with a 5-point Likert response scale that ranges from 1 to 5 (never to all the time). This scale has a one-factor structure. A total mean score is calculated, with higher scores indicating greater presenteeism. Karimi et al,[40] in a study using the JSRPS in community nurses in Australia using a 0 to 4 scale, found a mean of 1.4 (SD = 0.7).

STATISTICAL ANALYSIS

Survey responses were transferred from Qualtrics[28] to R[41] for scoring. All scales were scored according to published instructions. This was done in order to examine the utility of using each of the scales for this population. All missing data were excluded from analysis. Descriptive statistical analysis was conducted in SPSS (SPSS, version 24.0, IBM Corp, Armonk, NY).[42] Reliability and correlational scores were analyzed. As all of these instruments had not previously been used in a US nursing population, we conducted an exploratory factor analysis (EFA) on each measure for our sample. In parallel, we conducted confirmatory factor analysis (CFA) for each presenteeism measure according to each measure's published guidelines.[43] The EFA is data-driven and identifies the factor structure of an instrument within a particular dataset. Meanwhile, CFA is theory-driven, and findings provide information about how items in our dataset load on the factors created by the scale authors. Both types of analysis provide information about the fit of an instrument for our population. As our aim was to examine the fit of each of these measures and not to alter the measures, we did not conduct CFA based on the findings of our EFAs. We also ran a Harmon single-factor method to test for common-method bias. Common-method bias is artificial inflation or deflation in the relationships between variables that can lead to misleading results, which has been identified as an issue in prior discussions of measurement.[21]

RESULTS

There were 447 total participants in the survey. Participants came from 40 states. Ninety-four percent of participants were women. The mean age of the sample was 38.5 years (SD = 11.6). The mean years of experience as a nurse was 11.3 (10.1). The mean weekly hours worked was 34.0 (8.7). The Harmon single-factor test revealed there was more than one factor present (variance = 25.5%). The descriptive statistics of each measure of presenteeism are reported in Table 1. The EFA and CFA results for each measure can be found in Table 2. Varimax procedure was used for each measure as described by each measure author (s).

The SPS-6 mean score was 19.5. The total scale had a Cronbach α of 0.66. We found the same two-factor structure as the scale's authors. The Cronbach α of the two factors was 0.83 and 0.81. The total variance explained by the two factors was 75.2%. The CFA revealed: $X^2 = 63.12$ (df = 8), CFI = 0.95, and root mean square error of approximation (RMSEA) = 0.13.

The HWQ had a mean total score of 6.7. The scale had a Cronbach α of 0.94 across all items. Following the varimax rotation used by the instrument authors with a range of loading at 0.50, our initial EFA identified five factors with an additional factor comprised of the three parts of item 14 that also loaded on factor 1. The original authors identified six subscales: productivity (items 12–16); concentration/focus (items 20–24); supervisor relations (items 8 and 10); non-work satisfaction (items 4, 5, and 11); work satisfaction (items 2, 3, 6, and 7); and impatience/irritability (items 17–19). In our analysis, the productivity scale (items 12–16) loaded as published; the impatience/irritability (items 17–19) and

TABLE 1. Total and Subscale Descriptives

	N	Range	Mean (SD)
SPS-6	413	14–26	19.5 (2.4)
JSRPS	447	1–4.3	2.1 (0.6)
HPS	429	−56–53	−15.1 (15.0)
NWFQ			
(47 item)	398	0–62	17.0 (12.0)
(50 item)	398	0–63	17.0 (11.8)
Cognitive aspects of task execution and general incidents (11 items)	438	0–89	19.1 (15.9)
Impaired decision making (3 items)	419	0–100	17.4 (25.1)
Causing incidents at work (8 items)	408	0–63	7.6 (9.1)
Avoidance behavior (8 items)	419	0–88	18.6 (16.8)
Conflicts and irritations with colleagues (7 items)	419	0–93	22.1 (19.1)
Impaired contact with patients and their family (8 items)	431	0–79	16.9 (14.8)
Lack of energy and motivation (5 items)	430	0–100	23.3 (20.8)
HWQ total	400	0–10	6.7 (2.0)
Productivity (11 items)	405	2–9	7.6 (1.1)
Concentration/focus (4 items)	403	1–10	7.5 (2.0)
Supervisor relations (2 items)	414	1–10	7.1 (2.5)
Impatience/irritability (3 items)	402	1–10	7.7 (1.8)
Work satisfaction (4 items)	413	1–10	6.8 (1.9)
Non-work satisfaction (3 items)	414	1–10	7.4 (2.1)

concentration/focus (items 20–24) loaded onto one factor; supervisor relations (items 8 and 10) also loaded with item 7; non-work satisfaction (items 4, 5, and 11) loaded as published; and the work satisfaction subscale (items 2, 3, 6, and 7) did not include items 2 or 7. Items 1 (''Overall, how stressed have you felt this week?''), 2 (''How satisfied were you this week with the physical environment in which you work?''), and 9 (''How much control did you feel you had over how you did your job this week?'') did not load on any factors. All three parts of question 14 loaded on both the productivity subscale factor, but loaded higher as their own separate factor. A CFA following their original factor guidelines did not converge.

The mean score on the NWFQ in this sample was 17.0. The Cronbach's alpha for this scale was 0.95 across all items in the total scale or 0.91 across all subscales. We identified seven factors; however, our EFA revealed a factor structure different than the published structure. Items 34 loaded on both factors 2 and 3 (0.51 on factor 2 and 0.52 on factor 3). The following items did not load on any factor at a 0.50 loading or higher: 11, 15, 16, 26–28, 36, 40, 44, 46, and 47. The original seven factors were: (1) cognitive aspects of task execution and general incidents (items 1–9, 15, and 16); (2) impaired decision making (items 48–50); (3) causing incidents at work (items 14, 26–32); (4) avoidance behavior (items 36–43); (5) conflicts and irritations with colleagues (items 33–35, and 44–47); (6) impaired contact with patients and their families (items 10–13, and 22–25); and (7) lack of energy and motivation (items 17–21).[37] Our seven factors were: (1) items 1–10 and 12–14; (2) items 33–35, 37–39 and 45; (3) items 17–21 and 34; (4) items 22–25; (5) items 29–32; (6) items 48–50; and (7) items 41–43. Our CFA, following the published guidelines, had this fit: $X^2 = 3971$ (df = 1106), CFI = 0.78, RMSEA = 0.081.

The HPS had four factors, but the items in each factor differed from the published factor breakdown. The four factors we identified were (1) items 1–5, (2) items 6–9, (3) items 12–15, and (4) items 16–29. Items 10 and 11 did not load on any factor, while items 28 and 29 did load. Item 16 was loaded on both factors 3 and 4 (0.53 on factor 3 and 0.52 on factor 4). These four factors accounted for 96% of the variance. The Cronbach α for this scale was 0.97 across all 29 items or 0.92 across all four published subscales. The mean score was −15.1. Our CFA, following the published guidelines, had this fit: $X^2 = 1654.4$ (df = 318), CFI = 0.87, RMSEA = 0.099.

The JSRPS had a one-factor structure with six items. This aligned with previously published information on this scale. The Cronbach α for the scale was 0.86. The mean score on this scale was 2.1. The one-factor model explained 60.3% of the variance. A CFA identified: $X^2 = 161.0$ (df = 14), CFI = 0.882, RMSEA = 0.15.

DISCUSSION

Prior studies have explored presenteeism as either the byproduct of sickness or work environment issues. However, these different scopes of presenteeism research are related. This study conceptualized presenteeism holistically as presence at work with decreased engagement and performance, which is inclusive of both the sickness and work environment causes of presenteeism. Key findings of this study included higher rates of presenteeism among nurses and differences in factor structure and psychometrics of measures than previously reported. These findings can guide the improvement of presenteeism measurement and development of interventions to address presenteeism in nursing.

Nurses in our study had higher levels of presenteeism than those found in prior studies utilizing the same measurement instruments used in this study. The rates in our sample could be related to differences in healthcare systems across countries. For example, prior work using the SPS-6 scale among nurses working on a medical unit in Croatia identified a mean score of 21.3.[35] The mean score in our population was 19.5. On the SPS-6, a higher score means greater ability to perform at work with one's health condition. Our population's lower score means that nurses in our sample could have worse performance at work. Nurses in our sample also had more presenteeism than a sample of nurses in the Netherlands. The NWFQ was developed to assess presenteeism resulting from mental illness in nursing and allied health professionals in the Netherlands. The median score across 47 items (across six domains without the impaired decision-making subscale), as reported from a population of nurses and allied health professionals in the Netherlands, was 11.[38] The median score in our sample was 14 and the mean score in our sample was 17.0. Presenteeism was higher in our sample. It is possible that the higher score in our population is due to differences between nursing populations in the United States and the Netherlands. The Netherlands has universal healthcare coverage that focuses on prevention and has better healthcare outcomes than the United States in many areas.[44] These differences impact the role

TABLE 2. Factor Analysis Results for Each Measure

Measure	Cronbach Alpha Following Published Structure	EFA With Varimax Rotation (Number of Factors and Factor Loadings)	Confirmatory Factor Analysis
SPS-6	0.66	2 factors	CFI = 0.95
Factor 1 (items 1, 3, and 4)	0.83	0.65–0.85	TLI = 0.90
Factor 2 (items 2, 5, and 6)	0.81	0.68–0.82	AIC = 7284.76
			BIC = 7361.21
			RMSEA = 0.13
			X^2 = 63.116 (model vs saturated with 8 df)
			X^2 = 1035.20 (baseline vs saturated with 15 df)
			P = 0.000 in both cases
HWQ	0.94	5 factors	Did not converge
Subscale 1	0.95		
Subscale 2	0.83		
Subscale 3	0.91		
Subscale 4	0.90		
Subscale 5	0.83		
Subscale 6	0.81		
NWFQ	0.95	7 factors	CFI = 0.78
Subscale 1	0.94	0.58–0.85	TLI = 0.77
Subscale 2	0.90	0.51–0.78	AIC = 47402.74
Subscale 3	0.82	0.52–0.78	BIC = 48072.46
Subscale 4	0.82	0.51–0.77	RMSEA = 0.081
Subscale 5	0.85	0.51–0.84	X^2 = 3971.51 (model vs saturated with 1106 df)
Subscale 6	0.89	0.81–0.90	X^2 = 14295.39 (baseline vs saturated with 1176 df)
Subscale 7	0.91	0.56–0.62	P = 0.000 in both cases
HPS	0.97	4 factors	CFI = 0.87
Factor 1	0.88	0.57–0.82	TLI = 0.85
Factor 2	0.90	0.53–0.76	AIC = 17428.47
Factor 3	0.92	0.53–0.84	BIC = 17781.81
Factor 4	0.95	0.52–0.75	RMSEA = 0.099
			X^2 = 1654.35 (model vs saturated with 318 df)
			X^2 = 10306.13 (baseline vs saturated with 351 df)
			P = 0.000 in both cases
JSRPS	0.86	1 factor	CFI = 0.88
			TLI = 0.87
			AIC = 5521.46
			BIC = 5574.79
			RMSEA = 0.15
			X^2 = 161.02 (model vs saturated with 14 df)
			X^2 = 1264.01 (baseline vs saturated with 15 df)
			P = 0.000 in both cases

AIC, Akaike Information Criterion; BIC, Bayesian Information Criterion; CFI, Comparative Fit Index; HPS, Healthcare Productivity Scale; HWQ, Health and Work Questionnaire; JSRPS, Job-Stress-Related Presenteesim Scale; NWFQ, Nurses Work Functioning Questionnaire; RMSEA, root mean square error of approximation; SPS-6, Stanford Presenteeism Scale; TLI, Tucker Lewis Index.

of the nurse in each country's healthcare system. There also is one additional nurse per 1000 members of the population in the Netherlands than in the United States.[45]

It is important to note that both the SPS-6 and the NWFQ were originally developed to look at sickness presenteeism. In this study, we did not ask any questions about specific health conditions. A majority of studies published looking at presenteeism have looked at a specific health condition (eg, diabetes). Zaghloul et al[46] looked at Type 2 diabetes and presenteeism, and their sample had median SPS-6 scores of 26, meaning that participants had greater capacity to concentrate and complete work tasks despite their health condition. Our sample's lower scores (mean = 19.5) indicate that they have less capacity to concentrate and complete work. Prior work has found a strong link between presenteeism and mental health conditions, particularly depression (Wang et al).[47] In a recent study of nurse health and wellbeing and medical errors, 32% of nurse respondents reported some depression, 52% reported some anxiety, and 39% reported stress.[14] Depression was the strongest predictor of medical errors. A link between depression and nursing presenteeism has been found in prior studies.[18,38] The high rates of nurse presenteeism in our study support the need for continued research and interventions to address nurse mental and physical health.

The higher rates of presenteeism on measures focusing on factors beyond an individual's health could also be attributed to different roles studied in prior work within the healthcare system. This could be true for the higher rates on the JSRPS as well as the HPS. On the JSRPS, the mean in our sample was 2.1. This was higher than the published mean of 1.44 in hospital employees in Australia.[4] When compared with a population of nurses in Australia, in a study that used a 0 to 4 scale, our sample had lower presenteeism (mean of 1.1 vs 1.4).[40] Differences between hospital employees and nurses, as well as differences between the United States and Australia, could account for these differences. Studies using the JSRPS measure should be conducted in the United States to further explore if levels of presenteeism differ by nation and/or by profession. Meanwhile the HPS, has previously been administered to a US nursing population, but the sample was specifically emergency room nurses. The HPS sets a score of 0 or lower as when individuals should take time away from work.[39] The mean score in our survey was −15.1. In another study of emergency room nurses using this

scale, the mean score was −0.05.[31] Our sample had reduced productivity beyond what was found in the sample of emergency room nurses. It was broader than just emergency room nurses and included any nurse who worked on an inpatient hospital unit providing direct patient care. A recent study on workplace violence faced by nurses found 76% of nurses experienced verbal or physical abuse from patients and visitors in the last year.[48] The Joint Commission[49] has issued standards on managing these behaviors in order to create a culture of safety and the American Nurses Association[50] has issued a position statement on workplace violence. Workplace violence contributes to a stressful and hostile work environment and may lead to presenteeism. Interventions to address workplace violence and other stressors in the nurse work environment are needed.

The HWQ has not been previously used to survey presenteeism in a nursing population. However, it has been used in a population of airline reservation agents. In that study, a total mean score 7.7 was found.[32] The mean total score in our population was 6.7. On this scale, lower scores mean less satisfaction with performance.[32] The score in our sample is lower than this previous published score, meaning that nurses have a higher level of presenteeism. The HWQ has not been previously used in the nursing population. Nurses could have higher levels of presenteeism than other groups surveyed, as they have in other studies.[9] This could be due to the unique mental, physical, and emotional demands of nursing. It is also posited that higher levels among nurses are due their identity as a helper.[6,9]

This is the first study to compare multiple measures of presenteeism for use in a nursing population. The psychometric analysis revealed that the Cronbach α of the scales in this study ranged from 0.66 to 0.97. The SPS-6 had a Cronbach α of 0.66 for the total scale, which is lower than the recommendation of 0.70.[51] This scale should be further examined for use in the US nursing population. All other Cronbach α were higher than 0.86. The factor analysis of three of the five instruments revealed different underlying structures in these scales than what has been previously published. These differences varied from differences in the fit of particular items to subscale factors to differences in the number of subscale factors. The factor structures that we identified should be examined with CFA in another sample of US nurses. When conducting CFAs using the originally published factor structures, we found marginal fit for the majority of the measures. These findings have implications for the use of these currently existing measures, as well as the development of new measurement approaches.

It was interesting that both the HPS and the NWFQ, which were both developed for use specifically in the nursing population, had factor structures that did not align with published guidelines. These measures were created to fill specific gaps in presenteeism measurement in the nursing population. They each had questions about nursing-specific work demands. This raises the question of whether we should be developing nursing-specific measures or just utilizing and potentially adapting published measures from other fields.

Because presenteeism research has utilized multiple measures, it is difficult to compare prevalence levels across studies. Moreover, due to instrument length and diverse goals in measuring presenteeism, previous researchers have often elected to use specific subscales rather than using these measures in their entirety. The findings of this study reveal that the subscales and measures may not have the same psychometrics in one's own study population. Therefore, using a published subscale may not be appropriate if the subscale psychometrics do not align. For example, we utilized the entire NWFQ scale and identified a factor structure that differed from the published structure. Prior work has used three of the subscales rather than the scale in its entirety.[52] However, our findings indicating that the scale may not entirely align with published results should be considered when choosing to only use a portion of the entire scale.

Of the instruments we used, the one with the most potentially serious issues is the HWQ. Its factor structure is problematic; we could not get the CFA, as published, to converge. This instrument is newer and has not been tested in as many populations as the other instruments that we used.[30] This measure is unique in that it asks respondents to answer questions about not only their perception of their work performance, but also how they perceive their supervisors and coworkers view their work. This instrument is also one of the few presenteeism instruments that was examined against objective measures of total hours lost and performance in its development.[32] Both of these approaches are novel ways to triangulate presenteeism not seen in other measures used to assess presenteeism. Because of these different measurement approaches, we thought the HWQ may provide new insight into presenteeism. However, the factor structure of this measure did not align with the published structure, and we could not run a CFA. The psychometrics of this measure should be further studied in additional populations.

In this study, we focused on retrospective self-report measures of presenteeism. Retrospective measurement of presenteeism can provide valuable information about what is already occurring, but does not provide actionable information to address presenteeism before consequences occur. Real-time measurement of presenteeism could serve as a basis for interventions that can target nurses at the right time to prevent consequences of presenteeism. Self-report measurement of presenteeism faces the same challenges as other self-report measurement.[53] Ideally, measurement of presenteeism would include real-time objective measurement in addition to subjective measurement. Objective productivity measurement has been used to assess presenteeism in other industries.[54] However, this measurement differs across fields due to job tasks. In some fields, productivity can be measured objectively (eg, by the number of phone calls placed).[33] Measurement of productivity in nursing is difficult due to the multiple and unique demands nurses address during their shifts. This difficulty with measurement of productivity of nurses and quantifying the value of the work of a nurse to a healthcare organization has been raised by other scholars.[55,56] Future work to improve measurement of presenteeism should seek to develop objective prospective measures of presenteeism.

Potential limitations of this study are similar to limitations of other online survey studies and studies that utilize convenience and snowball recruitment approaches. Electronic surveys have traditionally had lower response rates. In a meta-analysis of electronic and paper surveys, Shih and Fan[57] found email surveys had a 33% response rate. The response rate of paper surveys was 20% higher at 53%. We selected convenience and snowball recruitment in order to reach as many nurses nationwide as possible. We tried to counteract electronic survey barriers through utilizing leverage-saliency theory[58] to increase the activation of potential participants to participant. We did this through video advertisements and posts appealing to nurses' altruism and raffling gift cards for participation and survey completion. It is also possible that there was selection bias. Nurses who are experiencing presenteeism and/or are particularly interested in the topic may have been more likely to participate in the survey. It also is possible that the timing of this survey may have impacted the findings. This survey was given during a particularly difficult flu season in the United States, which impacted staffing and sickness levels among clinicians. In the design of the study, we selected five measures of presenteeism. There are many more measures available. While we chose measures that were salient for our population, it is possible that there are other existing measures that would be more appropriate for use in nursing. Future studies should further examine measures of presenteeism for use within specific populations.

CONCLUSION AND RELEVANCE

In this study, we looked specifically at nursing. However, our broader conceptualization of presenteeism as encompassing both the sickness and work environment domains has relevance for research on presenteeism across professions. The 2 domains of research are intertwined and can both lead to negative consequences for employees and employers. The measurement of presenteeism needs to include both domains and seek to be prospective rather than retrospective. These advances in measurement are a crucial foundation to the development of future interventions. These interventions need to be multifaceted and address the multiple causes of presenteeism. Our understanding of the true cost of presenteeism will continue to grow as measurement improves through broader conceptualization. Similarly, the success of interventions will improve as multiple causes of presenteeism are addressed cohesively.

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