Table of Contents

Editor's Perspective

Overcoming Racism: A Call to Action for Our Collective and Renewed Commitment to Building an Ethos of Diversity, Equity, and Inclusion (DEI)

It has been 27 years since I arrived in the United States of America. However, this past couple of years, I have not seen actions with such great fervor from my friends, colleagues, peers, and community activists to overcome racism once again. As an immigrant to this country in the mid-1990s, I admit that I only have a sliver of knowledge about what Martin Luther King's (MLK) work and legacy have brought in creating a transformational culture of love, hope, and non-violence, not only in America but also globally. It is clear to me that MLK's non-violent protests for equal treatment and protection of every individual, family, and community accompanied his fervent hope for peace and prosperity for all (Whites, Blacks, Indigenous, and People of Color, including us, Filipino immigrants, to this country).

Although I have not lived in America during MLK's protests in the 1950s and 1960s, and I was not even born when MLK was assassinated on April 4, 1968, I know in my heart and my conscience that there is no excuse for me and for other nurses who came to this country after me, not to care or engage on civic activities that can promote diverse, equitable, and inclusive work environment, workforce, and society at large. It has been over five decades since MLK's assassination, yet, it is pretty apparent, and every day, I still see ugly racist, homophobic, Classist rhetoric, even from our highest elected officials, coupled with blatant violence and abusive treatment against whole groups of people who are not Whites. Events like Trayvon Martin's (2012) and George Floyd's (2020) unjust deaths, among many others, send reverberating signals that more work remains to be done to achieve MLK's dream for equal and just treatment to all the children of our beloved country.

We must ask, what can I do at home, work, and community to overcome racism? If you tear down the walls in your house, what should you and others hear and see in your words and actions, respectively? Personally, my journey to becoming a fierce advocate for diversity, equity, and inclusion (DEI) has been shaped by my own lived experience at home, at work, and in the community, since the first day, I arrived in this country on August 7, 1995. At home, my civil union partner and I will not shun calling out racist remarks from our friends, acquaintances, and even our family members. At work, I seek mentors and role models championing DEI in my nursing department, the university, and those DEI champions outside the university. I devote time to advocacy and civic actions in the community and society. I deliberately allocate financial donations to non-profit organizations that promote diversity, equity, and inclusion in our educational institutions, professional nursing societies, parks, museums, and performance and art centers.

As daunting as it may seem to overcome racism in this country, we all must realize that by not doing anything to address it, it will all come back to haunt us sooner or later. Therefore, I urge every nurse in this country, Filipino or not, to take on sustainable DEI efforts to overcome racism for good before our lifetime.

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President's Message

Collaborate and Publish
https://doi.org/10.13178/jnparr. 2022.12.02.1202

Just as seasons change, we also have a change in leadership in our organization. On July 9, 2022, I stepped down as my term ended as the Philippine Nurses Association of America (PNAA) President from 2020-2022. I cannot be prouder of the accomplishments that our organization have attained as we navigated the uncertainties brought upon by the pandemic for the past two years. I am grateful to our Journal of Nursing Practice Applications & Reviews of Research (JNPARR) Editorial Board for their excellent curation of relevant topics from heart failure patient's recovery to oral screening for young children in primary care. The article on how to prevent peripheral intravenous infiltration and extravasation continues to be a hot topic in the clinical setting particularly for patients receiving vesicant drugs. Two topics on education focus on success stories using virtual classroom while the other topic compares the educational needs of internationally educated nurses and home healthcare nurses. We know the convenience that virtual classes have provided even prior to the pandemic in being flexible and meeting the educational needs of adult learners. On the other hand, evidence has shown the importance of concurrency in matching the didactic instructions with the student's clinical practicum. The other consideration is the pedagogical skills of a faculty in designing the course taking into consideration the cultural and language barriers of the learner. The development of an instrument measuring academic social bullying in health sciences higher education will be a revelation. I encourage readers to go through these articles and share tips on how we can prevent this type of aggression and promote a positive relationship with our colleagues.

As I contemplate on my final message as I end my term, I would like to focus on how our organization have championed scholarly work encouraging members to do research and author articles. Publication and publishing are an arduous task and there are diverse ways that one can publish his/her work. Traditionally, the term refers to the creation and distribution of printed works, such as books, journals, newspapers, and magazines. Publications can either be published online or in print. I am pleased to share that there are two publication reports that PNAA was involved. First, the Philippine Nurses Association of America Foundation, Inc. (PNAAF) and PNAA through its collaboration with Morehouse School of Medicine contributed to the development of Filipinos Audience Profile as part of the National COVID-19 Resiliency Network. Next, we worked with ICF in facilitating focus group discussions and collecting surveys to have a better understanding of Filipinos overall health profile. This included Filipinos' COVID-19 perceptions and behaviors, the impact of COVID-19 to the community, trusted sources, and influencers. It also encompassed Filipinos' communication styles from messaging to health behavior and information seeking. It covers our language and acculturation, characteristics, and cultural understanding of our health. The geographic and other psychographic data, media habits of Filipinos and implications on education and economy were explored. An excerpt of the impact of COVID-19 highlighted that the increased incidents of racism, discrimination, and violence against Asians and Asian Americans. Since the start of the pandemic, many Asian Americans have experienced physical violence, racial slurs. Eight percent of Filipinos have reported hate crimes, making them among the largest ethnic groups who have reported such crimes

While we deal with the Anti-Asian hate crimes, we are making strides in another way. PNAA established a task force in September 2021 to address the anti-Asian hate crimes. One of the task force's goals is to understand our member's own experiences with racism. In June 2022, we launched a survey in racism and start with the outcome of the data to drive programs and interventions. Parallel to this work, I represented the organization as a member of the National Commission to Address Racism in Nursing. On May 25, 2022, the National Commission to Address Racism in Nursing released the foundational report on how racism shows up in nursing. This report is an accumulation of survey data, focus group discussions, and forums facilitated by the commissioners since January 2021. I was involved in two workgroups (policy and contemporary definition of racism). Representing PNAA as a member of this commission required time and commitment to ensure that Filipino Americans and Asian American and Pacific Islander (AAPI) community have adequate representation. I am proud that as the President of our organization, we have contributed to two specific sections: (1) Report # 2 of 6: Systemic Racism in Contemporary Society; and (2) Report # 4 of 6: How Racism Shows Up in Policy.

In this Report Series (National Commission to Address Racism in Nursing. 2022), Cathy Ceniza-Choy is referenced as a scholar who used oral histories to examine nursing and American Imperialism beyond the continental U.S, as it relates to Filipino nurses. It is evident that we need to have an active role in amplifying our own narratives. We need to author our own stories and capture the history and experiences of Filipino nurses in peer-reviewed journal that will allow other schol-

ars to learn more about our challenges and barriers in achieving our full potential because of bias and structural racism. I would encourage chapter leaders to disseminate the report's findings. I am a big proponent of data, and this is one of the ways that we can continue to improve the overall management of our association. To quote Norma Lang *"If we cannot name it, we cannot control it, practice it, teach it, finance it, or put it into public policy."* Let us continue to generate data, publish, and drive outcomes.

Even though we are undergoing a leadership transition, the role that we have in continuing our work through publication remains the same. The issues that we encounter in nursing education, practice, policy, and research will continue to impact our patient and our community. The reality is that PNAA will remain steadfast and strong amidst the changes in the workforce environment. Our evergreen vision to advocate and be the spark will continue as our organization transforms to newer innovation and leadership styles.

References

National Commission to Address Racism in Nursing. (2022). Report Series; Racism in Nursing. https://www.nursingworld.org/~49c4d0/globalassets/practiceandpolicy/workforce/commission-to-address-racism/racism-in-nursing-report-series.pdf

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JOURNAL OF NURSING PRACTICE APPLICATIONS & REVIEWS OF RESEARCH

Psychometric Development of an Instrument Measuring Academic Social Bullying in Health Sciences Higher Education: Content and Construct Validation

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Conflict of Interest
The authors declare that there is no conflict of interest.

Abstract

Background: Academic social bullying is receiving greater attention in the literature, but much research focuses on incivility not bullying. While health sciences and nursing clinical workplace bullying have been studied, higher education bullying has not been thoroughly scrutinized.

Objective: The aim of this study was to further develop and psychometrically test a de novo instrument on academic social bullying with health sciences educators for content and construct validation.

Methods: Survey design coupled with psychometric processes of instrument development were utilized. The study used a 40-item instrument and definition of academic social bullying developed in two previous studies to survey health sciences faculty from December 2020 to March 2021 for testing of content and construct validity. For internal reliability, Cronbach's alpha was evaluated. Open-ended questions asked about bullying experiences.

Results: Summary aggregate data were analyzed. Over 400 respondents represented various health sciences disciplines and academic ranks. Over 50% had witnessed or experienced academic social bullying. Factor analysis identified two factors: bullying behaviors (overt and covert) and poor administrative response/bullying facilitation/ organizational characteristics explaining nearly 56 percent of variance. Cronbach's alpha was 0.97 for the total instrument. For content validity, most items were rated as strongly agree or agree for appropriateness (4 and above on a scale of 1 to 5). Overall scale mean was 4.16. The two-factor result differed from a previous study with nurse educators with a three-factor model but aligned with original theoretical scale construction of bullying behaviors and organizational characteristics.

Conclusions: The Academic Social Bullying Scale is valid and reliable when tested with health sciences educators and can be used to assess bullying in higher education. Academic social bullying is a significant issue for health sciences faculty. The new instrument makes it possible to assess academic social bullying so meaningful interventions and policies can be constructed.

Keywords: *Academic social bullying; instrument development; health sciences faculty, incivility*

Background

Social bullying in academic nursing worksites has been studied (Beckmann et al., 2013; Dzurec, 2013, Dzurec et al., 2014; Goldberg et al., 2013), but existent scholarship on the phenomenon among health sciences academic worksites is limited. Emerging literature suggests that health sciences faculty are experiencing it (Aranda, 2018; Conco et al., 2021; Reigle, 2016)

Academic social bullying has a negative impact on higher education workforce morale and faculty recruitment and retention (Anjum & Muazzam, 2018; Hollis 2015; Hollis, 2019) as academic workplace bullying incidents are increasingly common (Hodgins & McNamara, 2019; Merilainen & Koiv, 2019). Multiple publications (Beckmann et al., 2013; Beitz & Beckmann, 2021a; Goldberg et al., 2013; Singh et al., 2019; Wieland & Beitz, 2015; Wunnenberg, 2020) support that academic social bullying is occurring in United States schools of nursing. Workplace bullying in clinical nursing practice areas has gained substantial research attention for patient safety (Arnetz et al., 2018; Arnetz et al., 2019). Relatively little attention has been focused on academic worksites for health disciplines. Existing literature focuses on bullying of health professions students or a need for resilience to be academically successful (Stoffel & Cain, 2018). Research among the health sciences (e.g., physical therapy, social work, occupational therapy, psychology, speech language hearing science, etc.) for faculty-to-faculty or administrator-to-faculty bullying is not well represented. Yet bullying research in higher education worksites is critically needed as the adult bully syndrome (verbally aggressive, narcissistic etc.) may be affecting academic leadership and faculty (Hollis, 2019; Merilainen, Nissinen et al., 2019; Piotrowski & King, 2016).

A review of several databases (CINAHL, MEDLINE, ERIC) was conducted using search terms "clinical workplace bullying," "social bullying," "academia," "higher education," "health professions," and "faculty" using a time interval between 2010 to 2021 with English language. A delimiter for research articles was included. MEDLINE identified 24 appropriate articles; CINAHL identified 19; and ERIC obtained 30. Repeated articles were removed, and articles with incorrect focus (bullying of students or practicing clinicians) were removed. Salient articles from earlier years were included. A total of 51 articles was utilized.

Higher education workplace bullying has increasingly become the focus of academic and popular interest (Barratt-Pugh & Krestelica, 2019; Merilainen et al., 2019; Pheko, 2018; Simpson & Cohen, 2004) as the educational sector has the dubious distinction of reporting the highest level of bullying (Barratt-Pugh et al., 2019; Hollis, 2015; Hollis 2019). Research suggests (Hollis, 2019) that academic workplace bullying negatively affects faculty health. Of 174 surveyed faculty, 145 reported health issues: insomnia (104 (73%); taking medication (34 (24%); and seeking counseling (47 (33%).

The Covid-19 pandemic may be fueling academic social bullying. Sources of concern include: 1) Monitoring/investigating abusive behaviors may not be a high priority; 2) Many former providers of institutional support to bully targets (e.g., Ombudsmen's Offices) have shifted attention to Covid-19 – related issues; and 3) Mounting pressure on lab researchers to maintain scientific productivity despite pandemic conditions. Mahmoudi and Keashly (2020) suggest that Covid-19 fueled bullying will have "long-lasting effects on scientific integrity, academic health, and sound medical decisions." (p.139).

In a United Kingdom study, Simpson and Cohen (2004) studied the gendered nature of bullying in higher education. Bullying was located in organizational power, involved work, and targeted individual characteristics. Identifying a theoretical view of bullying as characterized by negative behaviors and organizational "masculinist" characteristics, they surveyed 1900 faculty and staff at one university and found that most common bullying behaviors were unfair criticism, humiliation, and intimidation. Notably, significantly more women (21.7%) vs. men (7.7%) had decisions overturned; more women were bullied though all genders were affected.

Merilainen, Kayhko et al. (2019) studied academic bullying in 1,191 respondents (Estonia ($N = 864$), Finland ($N = 327$) and identified that 27% (Estonia) and 18% (Finland) had experienced academic bullying in the previous six months. The nine large-scale public universities contained health sciences and traditional academic foci. The two countries differed in how academic bullying was displayed; in Estonia bullying was more open while in Finland people were slandered covertly.

Cyberbullying has been studied (Symons et al., 2020). Defined as aggressive and intentional acts done using electronic forms, in two studies (Cassidy et al., 2014; Cassidy et al., 2017), research supported that university faculty are digitally bullied by faculty peers, administrators, and students. Digital bullying makes the academic bully a "faceless perpetrator." (Symons et al., 2020, p. 141). Mahmoudi, Ameli et al. (2020) described faculty bullying with organizational level status (i.e., scientific ranking indexes). They (2020) described academic bullying as senior scientists directing abusive behavior such as verbal insults, public shaming, isolation, and threats toward vulnerable junior faculty.

Multiple studies have examined faculty social bullying in academic nursing (Beitz & Beckmann, 2021a; Beitz & Beckman, 2021b; Dzurec et al., 2014; Feeg et al., 2021;

Goldberg et al., 2013; Wieland & Beitz, 2015). Other researchers have examined "incivility" in academic nursing (Clark et al., 2013; Clark et al., 2015; Clark et al., 2018). Incivility is defined as "rude or disruptive behaviors often resulting in psychological or physiological distress for target faculty which left unaddressed may progress into threatening situations" (Clark et al., 2013, p. 211). However, incivility lacks the power differential and persistence of bullying behaviors.

Karpetis (2019) discussed academic social bullying in schools of social work and its impact on faculty and the discipline. He described covert and open bullying behaviors and how schools and universities can become "emotionally toxic organizational cultures" (p. 316) and submits that bullying is an "organizational virus" whereby faculty and administrators target colleagues by disrespecting peer-reviewed publications and theoretical perspectives or isolating colleagues. In an auto-ethnography, Pheko (2018) described personal experience of academic social bullying while a university psychology faculty member. Pheko called academic bullying "the stressor to beat all stressors." (p.10)

A recent study done in South Africa (Conco et al., 2021) examined the prevalence of social bullying among academics, specifically a faculty of health sciences. Using a web-based questionnaire, results identified most respondents were white (52%), female (70%) and South African (85%). Academic social bullying was experienced by 58% of respondents and witnessed by 64%. Risk factors included: being female ($aOR = 1.83$; 95% CI [1.14-2.93]; $p < .05$) and being in a clinical practice/academic joint appointment ($aOR = 1.73$; 95% CI [1.29-2.32]; $p < 0.001$).

Only one study identified an attempt to measure academic social bullying. Merilainen & Koiv (2019) described theoretical dimensions of academic bullying and aimed to develop the Academic Bullying Inventory (ABI) to consider the context-specific nature of bullying. Using a five-component model (person-related insulting, work-related blaming, professional understanding, unreasonable work-related demands, and work-related malpractices) in the 10-item instrument, two items loaded on each component. The researchers noted that while it was a valid and reliable instrument, the scale could miss some critical aspects of academic social bullying due to its brevity and cultural-related effects.

Methods

Instrument

Content Validity

Initial content validity of the de novo instrument used in this study was conducted using the Content Validity Index (CVI) process (Lynn, 1983; Polit & Beck, 2006; Polit et al., 2007) with experts on academic social bullying. This process was described and resulted in a 40-item instrument targeting bullying behaviors and bullying organizational characteristics (Beitz & Beckmann, 2021a). A formal definition of academic social bullying was developed. Further content validation of the 40-items and the definition along with construct validation was conducted in a subsequent study with nursing faculty using the CVI process and factor analysis (Beitz & Beckmann, 2021b). On a scale of 1 to 5, 34 of 40 items were 4 and above (agree or strongly agree with appropriateness). The other six were rated 3.98 to 3.69 indicating "almost agree" appropriateness. Overall mean (4.16) indicated the scale's appropriateness for measuring academic social bullying in nursing faculty. The current study tested content validity of the 40 items with health sciences educators (nine disciplines) using the CVI process. The goal was to validate items as appropriate for health sciences research.

Construct Validity

Construct validity is the degree to which an instrument or scale measures the instrument's "hidden" variable (e.g., academic social bullying) (Polit & Beck 2021, p. 326-327). One well accepted statistical approach to construct validity is factor analysis (Larsen & Warne, 2010; Williams et al., 2010). Exploratory Factor Analysis (EFA) analyzes collected items for underlying variables (factors) (UCLA Institute for Digital Research & Consulting, 2020). Confirmatory Factor Analysis can be used following EFA to re-determine (select) the number of factors based on theoretical/conceptual underpinnings and verify if this is correct (UCLA Institute for Digital Research and Consulting, 2020). In a previous study (Beitz & Beckmann, 2021b), construct validity was tested with nursing faculty using EFA and CFA resulting in a three-factor model explaining 67 percent of variance. The total instrument had a Cronbach's alpha of 0.98.

Ethical Considerations

The study was submitted to the University Institutional Review Board (IRB) and approved as a non-intervention psychometric scale development design. A researcher/statistician contracting with the researchers for Qualtrics™ development and statistical analysis supported anonymity and confidentiality.

Data Collection/Data Analysis

Survey design combined with psychometric processes of instrument development were used. This study utilized the de novo scale and formal definition of academic social bullying developed and validated in two previous studies (Beitz & Beckmann, 2021a; Beitz & Beckmann, 2021b).

A nationally representative sample of health sciences faculty (physical therapy, social work, psychology, etc.) from baccalaureate and higher degree programs across the United States was identified via internet search. Educators' emails were obtained from universities' websites; an organization of interdisciplinary health sciences educators also posted

a study announcement in an electronic newsletter. Using a standardized text with informed consent through survey completion, the researchers invited participation. Data collection was done online using the software, Qualtrics™, from December 2020 to March 2021.

The researchers contracted with a research institute within the university for assistance with development of the Qualtrics website and to provide distance between researchers and respondents' identities (emails). The contract researcher/statistician permitted access to aggregate responses only. Given the need for adequate sample size, the email invitation was sent using Qualtrics with two follow-up reminders. The invitation to the professional society members was posted twice via newsletters. The invitation was sent to over 4,000 health sciences faculty with the hope of obtaining 300 responses. A minimum of 150 participants is necessary for quality instrument development (Hinkin et al., 1997). The total N for the sample was 417 (approximately 10% response rate) (with 76 to 105 responses less in some demographic and instrument item ratings at random throughout the survey due to missing data).

Researchers used the de novo instrument with the previously developed definition of academic social bullying (Beitz & Beckmann, 2021a; Beitz & Beckman, 2021b):

Academic social bullying is repeated and patterned psychological violence involving a power differential that is employed overtly or covertly to victimize, undermine, or intimidate another and results in feelings of threat to personal and professional well-being. Academic social bullying persists over time, and perpetrators aim to maliciously harm their targets. Bullying extends beyond incivility. Academic culture and/or environmental characteristics can facilitate bullying. Academic social bullying can encompass both behaviors and characteristics of an affected academic organization.

No specific conceptual/theoretical framework was utilized for the study. However, research from the literature undergirded the de novo instrument structure. Academic social bullying was characterized by both negative behaviors and organizational (workplace) characteristics (Beitz & Beckmann, 2021a; 2021b; Merilainen & Koiv, 2017; Merilainen et al., 2019)

Part one of the Qualtrics™ survey consisted of demographic questions about individuals taking the survey, their discipline, experience, and work environment. Part two of the survey consisted of the definition on academic social bullying followed by a 5-point Likert Scale rating level of agreement for item appropriateness in measuring academic social bullying (1 = strongly disagree – 5 = strongly agree). Sample items included: "Being consistently ignored or excluded from important academic activities or decisions" and "Key

areas of responsibility are removed or replaced with trivial or unpleasant tasks." Final open-ended questions allowed participants to comment on academic bullying (experiences or witnessing) and/or the research process.

Data coded by the consultant statistician were entered into the Qualtrics database in a format designed by the consultant. Excel Version 2016 (Microsoft Inc., Redmond, WA) and SPSS (Version 26.0, Armonk, NY) spreadsheets were downloaded from the Qualtrics site. Summary statistics analyzed demographic data. Quantitative ratings and qualitative narrative comments were analyzed along with demographic data. Factor analysis was conducted on the 40-item instrument.

Exploratory factor analysis was utilized to cluster together the underlying latent variables (factors). Factor extraction was completed using a principal components analysis and the model rotated using varimax rotation. In determining factor clusters, loadings over .4 were retained and anything less than .4 suppressed. Extracted sum of squared loadings were the initial eigenvalues after extraction. Varimax rotation rotated these eigenvalues to give the rotated sum of squared loadings. SPSS used the Kaiser criterion, dropping all components with eigenvalues less than 1.0. Using recommendations from Larsen and Warne (2010), a Scree test was developed.

Factor analysis included three different forms: an EFA and two CFAs to test a priori theoretical/conceptual assumptions about underlying variables. The two CFAs tested two and three factors related to EFA results. Principal component analysis and varimax rotation were utilized for interpretation. CFA was used to confirm the theorized underlying themes of academic social bullying behaviors and organizational characteristics.

Results

Demographics data (Table 1) showed that 417 respondents (total responses varied by question or item) were mostly female (*n* = 271; 65%), white (*n* = 280; 67%), and had a mean age of 50.48 years, with a range of 29 to 77. Over nine health sciences disciplines were represented with occupational therapy (*n* = 53; 12.7%), social work (*n* = 4; 10.8%) and physical therapy (*n* = 42; 10%) most frequently responding. Most participants were certified in higher education (*n* = 215; 51.6%), had a graduate degree (*n* = 298; 71.5%), and over 45% had a PhD. Most respondents had over 10 years of clinical experience (over 50%) and over 10 years higher education experience (over 55%). Nearly 78% worked in university settings with nearly 70% employed by an organization with over 400 students. The most common respondent was a tenured, research track faculty member (*n* = 161; 38.6%) and were Associate (*n* = 114; 27.3%) or Assistant (*n* = 113; 27.1%) Professors. Nearly 50% had been bullied in academia with almost 58% witnessing it. Ap-

Table 1

Phase Three: Academic Social Bullying Study Summary Demographic Statistics (N = 417)
Demographic Data (Total Responses Vary by Question)

Sex:	Female:	271 (65%)	**Age:**	Mean: 50.48 (321 responses; 96 no response)
(*N* = 417)	Male:	67 (16%)		Range: 29-77
	Transgender: 1 (0.2%)			
	Prefer not to respond: 2 (0.5%)			
	No response: 76 (18.2%)			

Race/Ethnicity:		
	African American or Black	9 (2.2%)
	Asian	14 (3.4%)
	Hawaiian or Pacific Islander	1 (0.2%)
	American Indian or Alaska Native	1 (0.2%)
	Hispanic or Latino	15 (3.6%)
	White	280 (67%)
	Other	10 (2.4%)

Academic Discipline:		
	Dietitian/Clinical Dietetics	21 (5%)
	Pharmacy	41 (9.8%)
	Physician Assistant	34 (8.2%)
	Psychology	33 (7.9%)
	Physical Therapy	42 (10%)
	Occupational Therapy	53 (12.7%)
	Social Work	45 (10.8%)
	Speech Language Hearing Science	35 (8.4%)
	Other: (Please Specify _____)	33 (7.9%)
	No response	80 (19.2%)

Current Certification in Higher Education Field	
	Yes 215 (51.6%)
	No 108 (25.3%)
	No response 94 (22.5%)

Basic Education:

Associate Degree	1 (0.2%)
Baccalaureate Degree	34 (8.2%)
Graduate Degree	298 (71.5%)
No Response	84 (20.1%)

Highest Level of Education

Baccalaureate degree	0 (0)
Master's degree	47 (11.3%)
PhD	188 (45.1%)
EdD	7 (1.7%)
Clinical Doctorate	73 (17.5%)
Post-Doctoral Degree	13 (3.1%)
Other	12 (2.9%)
No response	77 (18.5%)

Years of Clinical Experience		**Years of Higher Education Experience**	
30 and above	73 (17.5)	30 and above	43 (10.3)
25-29	39 (9.4)	25-29	30 (7.2)
20-24	34 (8.2)	20-24	40 (9.6)
15-19	42 (10.1)	15-19	49 (11.8)
10-14	47 (11.3)	10-14	58 (18.9)
5-9	31 (7.4)	5-9	76 (18.2)
0-4	71 (17)	0-4	44 (10.6)
No response	80 (19.2)	No response	77 (18.5)

Currently Working in Academia?   Yes   334 (80.1)
                                     No   5 (1.2)
                                     No response 78 (18.7)

Years in current position: 10.23 (8.44) (Mean, SD)

Are You Retired from Academia? (Last 5 Years)   Yes   6 (1.4)
                                                    No   316 (75.8)
                                                    No response 81 (19.4)

Education Employment Setting: (choose one)		**Size of School/Organization:**		**Please provide state(s) of current teaching: (e.g., CA, PA) Most Frequent:**
Comm. College	3 (0.7)	Over 400 students	289 (69.3)	AR, CA, FL, GA, IN
University	325 (77.9)	300-400 students	11 (2.6)	MI, NJ, PA, RI, TX
Hospital	2 (0.5)	200-299 students	8 (1.9)	
Teaching Medical Ctr.	10 (2.4)	100-199 students	17 (4.1)	
No response	78 (18.5)	0-99 students	12 (2.9)	
		No response	80 (19.2)	

Tenure Status:

Non-tenured Research Track	49 (11.8)
Tenured Research Track	161 (38.6)
Non-tenured Clinical Track	94 (22.5)
Not applicable to my setting	34 (8.2)
No response	79 (18.9)

Professorial Rank:

Professor	91 (21.8)
Associate Professor	114 (27.3)
Assistant Professor	113 (27.1)
Instructor	20 (4.8)
Other (specify ___)	0 (0)
No response	79 (18.9)

Geographic Area

Urban	184 (44.1)
Suburban	108 (25.9)
Rural	47 (11.3)

Affiliated University

Teaching Intensive	151 (36.2)
Research Intensive	161 (38.6)
Not applicable	0 (0)
No response	105 (25.2)

Have YOU Been Bullied in Academia?
Yes   208 (49.9)
No   132 (31.7)
No response 77 (18.5)

Have You WITNESSED Bullying in Academia?
Yes   238 (57.1)
No   99 (23.7)
No response 80 (19.2)

Have YOU ever left an academic position due to bullying?
Yes   53 (12.7)
No   287 (68.8)
No response 77 (18.5)

Are You Currently Considering Leaving An Academic Position Due to Bullying?
Yes   69 (16.5)
No   269 (64.5)
No Response 79 (18.9)

_____

proximately 13% left an academic position due to bullying. Notably, 69 (16.5%) were currently considering leaving an academic position due to bullying. This high occurrence of experiencing/witnessing academic bullying aligned with the earlier study with nurse faculty (Beitz & Beckmann, 2021b).

For confirmatory content validity assessment of item appropriateness, mean ratings of the 40 items were computed (Table 2). On a scale of 1 to 5, 31 of 40 items were 4.0 and above (indicating agree or strongly agree with appropriateness). Overall mean (4.16) for the 40 items supported the scale's appropriateness for representing academic social

Table 2
Mean Item Ratings (Scale of One to Five)
(N = 284)

Item Scale: 5 = Strongly Agree; 4 = Agree; 3 = Neither Agree or Disagree; 2 = Disagree; 1 = Strongly Disagree	Rating (Mean) (Scale 1-5)	SD
Someone withholds information that affects professional academic performance	4.18	0.82
Being humiliated or ridiculed in connection with your professional work in meetings or similar public places	4.62	0.76
Key areas of responsibility are removed or replaced with trivial or unpleasant tasks	4.15	0.96
Gossip and rumors are spread about you	4.48	0.81
Being consistently ignored or excluded from important academic activities or decisions	4.36	0.85
Having offensive remarks made about your personal physical attributes, attitudes, or private life	4.43	0.95
Being shouted at or targeted with spontaneous anger by administrators or faculty colleagues	4.52	0.91
Experiencing intimidating behavior such as finger-pointing and invasion of personal space	4.37	1.01
Receiving hints or signals from administrators or colleagues that you should resign your job	4.02	1.07
Receiving persistent criticism of your errors and mistakes	3.77	1.06
Being given academic tasks with unreasonable or impossible targets or deadlines	3.97	1.0
Excessive monitoring of teaching activities or work	3.89	1.07
Experiencing damage to professional academic reputation by false allegations	4.52	0.89
Having your professional opinions, academic achievements, and contributions ignored	4.10	0.93
Being denied professional development opportunities while other colleagues are supported	4.14	0.97
Being blamed for decisions outside personal control	4.02	0.98

Item Scale: 5 = Strongly Agree; 4 = Agree; 3 = Neither Agree or Disagree; 2 = Disagree; 1 = Strongly Disagree	Rating (Mean) (Scale 1-5)	SD
Being threatened by administrators either overtly or covertly	4.50	0.93
Being consistently allocated the heaviest teaching workload	3.93	1.07
Having new courses consistently assigned with few repeat assignments	3.66	1.09
Receiving condescending or rude remarks, destructive innuendo, and sarcasm from faculty colleagues/administrators either overtly or covertly	4.49	0.91
Exerting superiority, abusing position, or rank over others	4.48	0.83
Receiving pressure from administrators not to claim something to which by right one is entitled (i.e., sick leave, holiday entitlement, travel expenses reimbursement, leave of absence sabbatical)	4.13	1.05
Experiencing lateral violence frequently from academic co-workers	4.21	1.12
Bullying behaviors occur but leaders and coworkers are not willing to intervene	4.40	0.94
Verbal or written harassment including abusive or offensive telephone messages, emails, or memos	4.47	0.96
Having administrators frequently undermine one's professional, educational, or personal authority	4.31	0.84
Blocking promotion and/or professional advancement when they are justified	4.17	1.24
Withholding opinions to avoid administrative or colleague bullying behaviors	4.04	0.97
Being consistently treated unfairly or differently from others in your academic area	4.32	0.88
Having administrators exert excessive pressure or coercion to change an academic decision or stance (e.g., change a grade)	4.11	1.02
Having administrators consistently making aggressive or inappropriate visits at one's faculty office	4.17	1.09
Having faculty-related academic decisions based more on power and politics rather than equity	4.28	0.91
Having administrators or senior faculty bully junior faculty	4.51	0.82
Experiencing academic administrators lack understanding of bullying and how to manage it	3.95	1.01
Experiencing the use of peer review to foster bullying processes in tenure and promotion decisions	4.00	1.05
Faculty are not protected from bullying by human resources processes when complaints are made	4.21	0.96
Academic leaders who bully respond in unpredictable ways creating mistrust	4.23	0.95
Faculty governance is given lip service while administrators really control decisions	3.99	1.03
Protecting oneself from bullying by engaging in outside professional activities and working off campus	3.65	1.20
Having major decisions affecting academic status consistently communicated by email rather than face to face discussions	3.44	1.17
Average of Mean Scores/SD	4.16	

N of 133 (Missing Responses)   (Total *N* = 417)

bullying in health sciences education. For reliability assessment, the Cronbach alpha result of the total scale and for all factors was strong (above 0.91 alphas) (Table 3).

Before factor analysis, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were calculated. High KMO values (close to 1.0) indicate appropriateness of factor analysis. A significant Bartlett's result supports use of factor analysis (Costello & Osbourne, 2005; Henson & Roberts, 2006; Williams et al., 2010). Results for the KMO and Bartlett's analyses were 0.96 and 8542.8 (p = 0.00), respectively, and data were submitted to factor analysis.

Following varimax rotation, the EFA yielded 5 factors with eigenvalues above one. Explained variance and cumulative percent of explained variance are listed in Table 4. Using "rules" suggested by Polit and Beck (2021) and Williams et al. (2010), the amount of variance explained by factors

should equal at least 60%. For any individual factor to be meaningful, it must account for at least 5% or more of total variance (p. 352). Because three factor model was almost 50% of total variance, researchers incorporated follow up CFA testing for both two and three factors given the theoretical/conceptual perspectives and results from previous testing (Beitz & Beckmann, 2021b). A Scree test supported a two-factor model (Costello & Osborne, 2005; Williams et al., 2010). CFA analyses are shown in Table 5; loadings of individual items on factors one, two, and three are listed in Table 6 and 7. Two factor structure was strongest in terms of eigenvalues, explained variance (almost 56%), and higher communalities (Costello & Osborne, 2005; Henson & Roberts, 2006; Williams et al., 2010). For transparency about decisions, both two and three factor results are presented in Tables 6 and 7.

Factor One (Bullying Behaviors: Overt and Covert) loaded on 20 items. Specific loadings on factor one included item

Table 3

Reliability: Cronbach's Alpha

Factor: Two Factor	Number of Items	Alpha
Factor I	20	0.96
Factor II	20	0.93
Factor: Three Factor	Number of Items	Alpha
Factor I	16	0.94
Factor II	12	0.91
Factor III	12	0.92
Factor: Five Factor		
Total Instrument	40	0.97

KMO = 0.96
Bartlett's test of Sphericity = 8542.82 (p = 0.00)

Table 4

Exploratory Factor Analysis: Varimax Rotation
5 Factors

Factor	Eigenvalue	Percentage of Variance Explained	Cumulative Percentage of Variance Explained
1	9.36	23.390	23.39
2	5.62	14.060	37.45
3	4.91	12.278	49.73
4	3.53	8.80	58.53
5	2.77	6.94	65.48

Table 5

Confirmatory Factor Analyses: Varimax Rotation

Factor	Eigenvalue	Percentage of Variance Explained	Cumulative Percentage of Variance Explained
1	11.82	29.58	29.56
2	10.47	26.19	55.76

Factor	Eigenvalue	Percentage of Variance Explained	Cumulative Percentage of Variance Explained
1	10.18	25.46	25.46
2	7.57	18.92	44.39
3	6.15	15.39	59.78

Table 6

Factor Loadings: Two Factor

Item No.	Item Statement	Factor 1	Factor 2	Communality
1	Someone withholds information that affects professional academic performance	.36	.52	.387
2	Being humiliated or ridiculed in connection with your professional work in meetings or similar public places	.63	.21	.451
3	Key areas of responsibility are removed or replaced with trivial or unpleasant tasks	.37	.61	.511
4	Gossip and rumors are spread about you	.56	.38	.435
5	Being consistently ignored or excluded from important academic activities or decisions	.42	.59	.523
6	Having offensive remarks made about your personal physical attributes, attitudes, or private life	.74	.13	.590
7	Being shouted at or targeted with spontaneous anger by administrators or faculty colleagues	.76	.27	.671
8	Experiencing intimidating behavior such as finger-pointing and invasion of personal space	.78	.23	.662
9	Receiving hints or signals from administrators or colleagues that you should resign your job	.57	.44	.503
10	Receiving persistent criticism of your errors and mistakes	.32	.66	.532
11	Being given academic tasks with unreasonable or impossible targets or deadlines	.43	.62	.565
12	Excessive administrative monitoring of teaching activities or work	.36	.64	.542
13	Experiencing damage to professional academic reputation by false allegations about you and/or your teaching	.79	.15	.611
14	Having your professional opinions, academic achievements, and contributions ignored	.23	.72	.570
15	Being denied professional development opportunities while other colleagues are supported	.50	.53	.521
16	Being blamed for decisions outside personal control	.49	.53	.530
17	Being threatened by administrators either overtly or covertly	.78	.23	.650
18	Being consistently allocated the heaviest teaching workload	.35	.65	.535
19	Having new courses consistently assigned with few repeat assignments	.43	.60	.544
20	Receiving condescending or rude remarks, destructive innuendo, and sarcasm from faculty colleagues/administrators either overtly or overtly	.83	.32	.767

numbers: 2, 4, 5, 6, 7, 8, 9, 13, 16, 17, 20, 21, 22, 23, 24, 25, 27, 30, 31, and 33. Factor Two (Poor Administrative Response/Bullying Facilitation/Organizational Characteristics) loaded on 20 items. Specific items on factor two were: 1, 3, 10, 11, 12, 14, 15, 18, 19, 26, 28, 29, 32, 34, 35, 36, 37, 38, 39, 40 (Table 8). When items loaded on more than one factor, the factor with the higher loading and with researcher supportive judgment and higher mean ratings was assigned the item (Costello & Osborne, 2005; Hair et al., 2009). Only two exceptions occurred. In Factor One, item 5 and item 16 were loaded slightly higher in Factor Two. Qualitative comments supported placement of the items in Factor One along with consideration of mixed loadings and communalities below .60. Intercorrelational results of all 40 items are displayed in Table 9.

The 40 items were originally theoretically categorized to represent two underlying themes: academic social bullying behaviors and bullying organizational characteristics (administrative issues). This theoretical-based structure was confirmed in the CFA as a two-factor result. In an earlier study with nursing educators, bullying behaviors separated between overt vs. covert bullying and resulted in a three-factor model (Beitz & Beckmann, 2021b). In the current study, Factor One contained both overt and covert behaviors.

Item No.	Item Statement	Factor 1	Factor 2	Communality
21	Exerting superiority, abusing position, or rank over others	.68	.37	.610
22	Receiving pressure from administrators not to claim something to which by right one is entitled (i.e., sick leave, holiday entitlement, travel expenses reimbursement, leave of absence, sabbatical)	.63	.48	.603
23	Experiencing lateral violence frequently from academic co-workers	.72	.14	.540
24	Bullying behaviors occur but leaders and coworkers are not willing to intervene	.57	.48	.534
25	Verbal or written harassment including abuse or offensive telephone messages, emails, or memos	.81	.17	.688
26	Having administrators frequently undermine one's professional, educational, or personal authority	.54	.60	.649
27	Blocking promotion and/or professional advancement when they are justified	.42	.39	.332
28	Withholding opinions to avoid administrative or colleague bullying behaviors	.14	.73	.551
29	Being consistently treated unfairly or differently from others in your academic area	.47	.63	.625
30	Having administrators exert excessive pressure or coercion to change an academic decision or stance (e.g., change a grade)	.60	.47	.572
31	Having administrators consistently making aggressive or inappropriate visits at one's faculty office	.83	.20	.736
32	Having faculty-related academic decisions based more on power and politics rather than equity	.42	.55	.498
33	Having administrators or senior faculty bully junior faculty	.77	.27	.677
34	Experiencing academic administrators lack understanding of bullying and how to manage it	.21	.73	.59
35	Experiencing the use of peer review to foster bullying processes in tenure and promotion decisions	.36	.54	.429
36	Faculty are not protected from bullying by human resources processes when complaints are made	.35	.57	.427
37	Academic leaders who bully respond in unpredictable ways creating mistrust	.41	.67	.602
38	Faculty governance is given lip service while administrators really control decisions	.01	.76	.569
39	Protecting oneself from bullying by engaging in outside professional activities and working off campus	.01	.67	.435
40	Having major decisions affecting academic status consistently communicated by email rather than face to face discussions	.03	.74	.538
	% Variance	29.58	26.19	

Table 7

Factor Loadings: Three Factors

Item Number/Statement	Factor 1	Factor 2	Factor 3	Communality
1) Someone withholds information that affects professional academic performance		.55	.20	0.43
2) Being humiliated or ridiculed in connection with your professional work in meetings or similar public places	.63			0.46
3) Key areas of responsibility are removed or replaced with trivial or unpleasant tasks		.59		0.54
4) Gossip and rumors are spread about you	.58			0.50
5) Being consistently ignored or excluded from important academic activities or decisions		.56		0.54
6) Having offensive remarks made about your personal physical attributes, attitudes, or private life	.76			0.60
7) Being shouted at or targeted with spontaneous anger by administrators or faculty colleagues	.79			0.71
8) Experiencing intimidating behavior such as finger-pointing and invasion of personal space	.78			0.69
9) Receiving hints or signals from administrators or colleagues that you should resign your job	.44	.62		0.58
10) Receiving persistent criticism of your errors and mistakes		.69		0.61
11) Being given academic tasks with unreasonable or impossible targets or deadlines		.71		0.65
12) Excessive administrative monitoring of teaching activities or work		.73		0.65
13) Experiencing damage to professional academic reputation by false allegations about you and/or your teaching	.71			0.62
14) Having your professional opinions, academic achievements, and contributions ignored		.50	.54	0.57
15) Being denied professional development opportunities while other colleagues are supported		.58		0.55
16) Being blamed for decisions outside personal control	.41	.51		0.53
17) Being threatened by administrators either overtly or covertly	.73			0.65
18) Being consistently allocated the heaviest teaching workload		.67		0.61
19) Having new courses consistently assigned with few repeat assignments		.76		0.69
20) Receiving condescending or rude remarks, destructive innuendo, and sarcasm from faculty colleagues/administrators either overtly or overtly	.78			0.77
21) Exerting superiority, abusing position, or rank over others	.66			0.61
22) Receiving pressure from administrators not to claim something to which by right one is entitled (i.e., sick leave, holiday entitlement, travel expenses reimbursement, leave of absence, sabbatical)	.56	.53		0.62
23) Experiencing lateral violence frequently from academic co-workers	.69			0.54
24) Bullying behaviors occur but leaders and coworkers are not willing to intervene	.55		.47	0.58

Item Number/Statement	Factor 1	Factor 2	Factor 3	Communality
25) Verbal or written harassment including abuse or offensive telephone messages, emails, or memos	.79			0.69
26) Having administrators frequently undermine one's professional, educational, or personal authority	.46	.53		0.65
27) Blocking promotion and/or professional advancement when they are justified		.48	.63	0.36
28) Withholding opinions to avoid administrative or colleague bullying behaviors				0.56
29) Being consistently treated unfairly or differently from others in your academic area	.43	.42	.51	0.63
30) Having administrators exert excessive pressure or coercion to change an academic decision or stance (e.g., change a grade)	.56	.42		0.57
31) Having administrators consistently making aggressive or inappropriate visits at one's faculty office	.78			0.73
32) Having faculty-related academic decisions based more on power and politics rather than equity			.47	0.51
33) Having administrators or senior faculty bully junior faculty	.77			0.69
34) Experiencing academic administrators lack understanding of bullying and how to manage it			.75	0.68
35) Experiencing the use of peer review to foster bullying processes in tenure and promotion decisions			.43	0.43
36) Faculty are not protected from bullying by human resources processes when complaints are made			.58	0.51
37) Academic leaders who bully respond in unpredictable ways creating mistrust	.43		.65	0.68
38) Faculty governance is given lip service while administrators really control decisions			.79	0.66
39) Protecting oneself from bullying by engaging in outside professional activities and working off campus			.74	0.56
40) Having major decisions affecting academic status consistently communicated by email rather than face to face discussions			.67	0.55
% Variance	25.46	18.92	15.39	

Table 8

Factor Loadings: Two Named Factors and Associated Items

Item Number/Statement	Factor 1	Factor 2	Communality
FACTOR 1: Bullying Behaviors Overt and Covert			
2) Being humiliated or ridiculed in connection with your professional work in meetings or similar public places	.63	.21	.451
4) Gossip and rumors are spread about you	.56	.38	.435
5) Being consistently ignored or excluded from important academic activities or decisions	.42	.59	.52
6) Having offensive remarks made about your personal physical attributes, attitudes, or private life	.74	.13	.590
7) Being shouted at or targeted with spontaneous anger by administrators or faculty colleagues	.77	.27	.671
8) Experiencing intimidating behavior such as finger-pointing and invasion of personal space	.79	.23	.662
9) Receiving hints or signals from administrators or colleagues that you should resign your job	.57	.44	.503
13) Experiencing damage to professional academic reputation by false allegations about you and/or your teaching	.79	.15	.611
16) Being blamed for decisions outside personal control	.49	.53	.530
17) Being threatened by administrators either overtly or covertly	.78	.23	.650
20) Receiving condescending or rude remarks, destructive innuendo, and sarcasm from faculty colleagues/administrators either overtly or overtly	.83	.32	.767
21) Exerting superiority, abusing position, or rank over others	.68	.37	.610
22) Receiving pressure from administrators not to claim something to which by right one is entitled (i.e., sick leave, holiday entitlement, travel expenses reimbursement, leave of absence, sabbatical)	.63	.48	.603
23) Experiencing lateral violence frequently from academic co-workers	.72	.15	.540
24) Bullying behaviors occur but leaders and coworkers are not willing to intervene	.56	.48	.534
25) Verbal or written harassment including abuse or offensive telephone messages, emails, or memos	.82	.17	.688
27) Blocking promotion and/or professional advancement when they are justified	.42	.39	.332
30) Having administrators exert excessive pressure or coercion to change an academic decision or stance (e.g., change a grade)	.60	.47	.572
31) Having administrators consistently making aggressive or inappropriate visits at one's faculty office	.83	.21	.736
33) Having administrators or senior faculty bully junior faculty	.77	.27	.677

Item Number/Statement	Factor 1	Factor 2	Communality
FACTOR 2: Poor Administrative Response/Bullying Facilitation/ Organization Characteristics			
1) Someone withholds information that affects professional academic performance	.36	.52	.387
3) Key areas of responsibility are removed or replaced with trivial or unpleasant tasks	.38	.60	.511
10) Receiving persistent criticism of your errors and mistakes	.32	.66	.532
11) Being given academic tasks with unreasonable or impossible targets or deadlines	.43	.61	.565
12) Excessive administrative monitoring of teaching activities or	.36	.65	.542
14) Having your professional opinions, academic achievements, and contributions ignored	.23	.72	.570
15) Being denied professional development opportunities while other colleagues are supported	.50	.53	.521
18) Being consistently allocated the heaviest teaching workload	.35	.66	.535
19) Having new courses consistently assigned with few repeat assignments	.43	.60	.544
26) Having administrators frequently undermine one's professional, educational, or personal authority	.54	.60	.649
28) Withholding opinions to avoid administrative or colleague bullying behaviors	.14	.73	.551
29) Being consistently treated unfairly or differently from others in your academic area	.47	.63	.649
32) Having faculty-related academic decisions based more on power and politics rather than equity	.43	.57	.498
34) Experiencing academic administrators lack understanding of bullying and how to manage it	.22	.73	.590
35) Experiencing the use of peer review to foster bullying processes in tenure and promotion decisions	.37	.54	.429
36) Faculty are not protected from bullying by human resources processes when complaints are made	.35	.55	.427
37) Academic leaders who bully respond in unpredictable ways creating mistrust	.41	.66	.602
38) Faculty governance is given lip service while administrators really control decisions	.01	.76	.569
39) Protecting oneself from bullying by engaging in outside professional activities and working off campus	.01	.67	.435
40) Having major decisions affecting academic status consistently communicated by email rather than face to face discussions	.03	.74	.538
%Variance	29.58	26.19	

Table 9

*Item Correlation Matrix *** (All p < .05)*

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	1	.33	.52	.39	.49	.34	.34	.33	.49	.43	.47	.43	.41	.46	.46	.44	.44	.41	.47	.42	.42	.46	.25	.41	.38	.45	.37	.45	.51	.37	.41	.42	.34	.37	.32	.30	.39	.36	.25	.39
2	.33	1	.47	.53	.48	.55	.65	.61	.44	.39	.37	.31	.49	.37	.38	.36	.43	.37	.34	.61	.45	.39	.39	.38	.54	.43	.31	.16	.49	.42	.49	.35	.51	.34	.37	.30	.42	.15	.19	.21
3	.52	.47	1	.47	.62	.39	.44	.41	.52	.57	.53	.54	.36	.51	.55	.45	.38	.52	.56	.48	.41	.48	.33	.48	.35	.53	.42	.43	.57	.39	.41	.45	.39	.46	.45	.39	.53	.38	.32	.39
4	.34	.53	.48	1	.51	.51	.59	.52	.34	.38	.35	.36	.48	.38	.38	.45	.40	.34	.36	.56	.47	.45	.42	.52	.55	.49	.33	.36	.49	.39	.44	.40	.51	.43	.37	.44	.51	.28	.30	.22
5	.49	.48	.62	.51	1	.38	.52	.50	.54	.57	.53	.50	.38	.59	.62	.50	.39	.49	.53	.49	.46	.49	.29	.47	.41	.58	.38	.45	.59	.41	.39	.49	.42	.48	.46	.38	.49	.35	.31	.32
6	.34	.55	.39	.51	.38	1	.62	.61	.45	.28	.40	.25	.58	.23	.40	.36	.55	.34	.39	.65	.54	.55	.52	.44	.52	.37	.31	.19	.49	.46	.68	.47	.64	.24	.43	.33	.43	.12	.21	.15
7	.34	.65	.44	.59	.52	.62	1	.82	.48	.35	.45	.39	.55	.36	.47	.52	.61	.44	.43	.73	.61	.57	.53	.52	.71	.54	.38	.31	.50	.54	.62	.46	.64	.44	.41	.41	.53	.26	.20	.29
8	.33	.61	.41	.52	.50	.61	.81	1	.54	.37	.46	.38	.61	.35	.44	.52	.62	.41	.41	.74	.59	.52	.52	.51	.67	.51	.39	.29	.49	.56	.64	.44	.64	.42	.43	.43	.51	.22	.22	.24
9	.49	.44	.52	.39	.54	.45	.48	.54	1	.58	.58	.56	.58	.40	.51	.54	.59	.48	.56	.53	.45	.58	.47	.43	.49	.49	.39	.34	.50	.50	.54	.39	.46	.38	.42	.40	.42	.26	.24	.37
10	.43	.39	.57	.38	.57	.28	.35	.37	.58	1	.64	.69	.31	.52	.46	.55	.38	.56	.57	.46	.43	.44	.31	.41	.36	.55	.40	.47	.52	.43	.37	.37	.37	.49	.37	.44	.54	.36	.38	.42
11	.47	.37	.53	.35	.53	.40	.45	.46	.58	.64	1	.72	.45	.49	.47	.58	.49	.61	.64	.52	.51	.55	.39	.48	.41	.63	.43	.45	.50	.56	.52	.46	.48	.48	.43	.43	.50	.37	.35	.42
12	.43	.31	.54	.36	.50	.25	.39	.38	.56	.69	.72	1	.40	.51	.52	.56	.43	.60	.60	.49	.47	.52	.44	.45	.42	.59	.39	.46	.48	.51	.41	.42	.43	.44	.38	.47	.49	.38	.35	.43
13	.41	.49	.36	.48	.38	.58	.55	.61	.58	.31	.45	.41	1	.28	.49	.48	.61	.36	.43	.68	.53	.53	.59	.48	.63	.48	.41	.21	.42	.52	.61	.31	.55	.24	.39	.34	.31	.09	.13	.21
14	.46	.37	.51	.38	.59	.23	.36	.35	.40	.52	.49	.51	.28	1	.55	.51	.31	.53	.48	.43	.44	.37	.16	.47	.27	.58	.33	.48	.54	.47	.24	.52	.32	.56	.39	.42	.55	.48	.40	.42
15	.46	.38	.55	.38	.62	.40	.47	.44	.51	.46	.47	.52	.49	.55	1	.54	.43	.47	.49	.54	.53	.59	.43	.52	.48	.62	.46	.41	.60	.52	.48	.50	.47	.43	.51	.39	.51	.29	.25	.30
16	.44	.36	.45	.45	.50	.36	.52	.52	.54	.55	.59	.56	.48	.51	.54	1	.49	.47	.49	.55	.48	.54	.44	.43	.51	.61	.45	.46	.51	.55	.52	.43	.54	.49	.45	.49	.52	.34	.36	.36
17	.44	.42	.38	.41	.39	.55	.61	.62	.59	.38	.49	.43	.61	.31	.43	.49	1	.37	.44	.66	.63	.59	.59	.55	.68	.56	.44	.25	.50	.58	.71	.41	.64	.29	.38	.49	.45	.19	.17	.19
18	.41	.37	.52	.34	.49	.34	.44	.41	.48	.56	.61	.60	.36	.53	.47	.47	.37	1	.76	.52	.49	.59	.31	.42	.32	.55	.36	.43	.54	.53	.43	.54	.44	.45	.49	.39	.48	.41	.31	.47
19	.42	.34	.56	.36	.54	.39	.43	.41	.56	.57	.64	.61	.43	.48	.59	.49	.44	.76	1	.54	.49	.65	.38	.44	.39	.57	.42	.43	.54	.52	.53	.49	.48	.44	.53	.37	.46	.35	.26	.39
20	.42	.61	.48	.56	.48	.65	.73	.74	.74	.53	.46	.52	.49	.68	.43	.54	.65	.52	.55	1	.68	.64	.59	.64	.73	.64	.39	.37	.57	.62	.71	.53	.72	.41	.46	.45	.56	.26	.26	.26
21	.42	.45	.41	.47	.46	.54	.61	.59	.45	.43	.51	.47	.53	.44	.53	.48	.63	.49	.49	.65	1	.62	.49	.62	.57	.61	.40	.39	.56	.64	.65	.54	.66	.39	.39	.41	.58	.25	.23	.26
22	.46	.39	.48	.45	.49	.55	.57	.52	.55	.44	.55	.52	.53	.37	.59	.54	.59	.59	.65	.64	.62	1	.55	.55	.56	.57	.45	.45	.50	.64	.66	.53	.57	.39	.46	.39	.53	.33	.24	.34
23	.25	.39	.33	.42	.29	.52	.53	.52	.47	.31	.39	.44	.59	.16	.43	.42	.44	.59	.31	.59	.49	.55	1	.47	.65	.39	.38	.27	.42	.49	.64	.36	.58	.25	.41	.39	.35	.16	.18	.18
24	.41	.38	.48	.52	.47	.44	.52	.51	.43	.41	.48	.45	.48	.47	.52	.43	.55	.42	.44	.64	.62	.55	.47	1	.53	.61	.35	.49	.54	.60	.51	.47	.56	.56	.42	.53	.62	.41	.32	.32
25	.38	.54	.35	.55	.41	.52	.71	.67	.49	.36	.42	.42	.63	.27	.48	.51	.68	.32	.38	.73	.57	.56	.65	.53	1	.55	.42	.29	.48	.54	.68	.43	.63	.37	.34	.37	.44	.17	.12	.19
26	.45	.43	.53	.49	.58	.37	.54	.51	.49	.55	.63	.59	.48	.58	.62	.61	.56	.56	.57	.63	.61	.52	.39	.61	.55	1	.53	.49	.67	.62	.56	.57	.59	.53	.49	.48	.62	.41	.33	.38
27	.37	.31	.42	.33	.38	.31	.38	.33	.38	.40	.43	.39	.42	.33	.46	.45	.44	.36	.42	.39	.41	.45	.38	.35	.42	.53	1	.41	.46	.43	.43	.39	.41	.34	.36	.33	.37	.21	.67	.28
28	.45	.16	.43	.35	.45	.19	.31	.29	.34	.47	.45	.46	.21	.48	.41	.46	.38	.43	.43	.37	.39	.45	.27	.49	.29	.49	.41	1	.55	.39	.25	.46	.26	.60	.39	.37	.50	.56	.47	.49
29	.51	.49	.57	.49	.59	.49	.50	.49	.50	.52	.50	.48	.42	.54	.60	.51	.50	.54	.54	.57	.56	.50	.41	.54	.58	.67	.46	.55	1	.52	.54	.63	.56	.54	.53	.47	.66	.42	.45	.46
30	.30	.37	.42	.39	.39	.41	.46	.54	.56	.50	.43	.56	.51	.52	.47	.52	.55	.58	.12	.62	.64	.64	.49	.60	.54	.62	.43	.39	.52	1	.58	.56	.59	.43	.39	.39	.52	.37	.31	.39
31	.41	.49	.41	.44	.39	.68	.62	.64	.54	.37	.52	.41	.61	.24	.48	.52	.71	.43	.53	.71	.65	.66	.64	.51	.68	.56	.43	.25	.54	.68	1	.50	.72	.28	.43	.37	.47	.16	.16	.22
32	.42	.35	.45	.40	.49	.47	.46	.44	.39	.37	.46	.42	.38	.52	.50	.43	.41	.54	.49	.53	.54	.53	.36	.47	.43	.57	.39	.46	.63	.56	.50	1	.50	.49	.48	.41	.52	.46	.34	.46
33	.34	.51	.39	.51	.42	.64	.64	.64	.46	37	48	.63	.55	.32	.47	.54	.64	.44	.48	.72	.66	.57	.58	.56	.63	.59	.41	.26	.56	.59	.72	.50	1	39	.49	.49	.54	.21	.19	.19
34	.37	33	.46	.43	.48	.24	.44	.42	.37	.49	.48	.44	.24	.55	.43	.49	.29	.45	.44	.41	.39	.39	.25	.56	.37	.51	.34	.60	.53	.43	.28	.49	39	1	.48	.53	.62	.59	.50	.53
35	.32	.37	.45	.37	.46	.43	.41	.43	.42	.37	.44	.38	.39	.39	.51	.45	.38	.49	.53	.46	.39	.49	.41	.42	.34	.49	.36	.39	.53	.39	43	.48	.49	.48	1	.43	.50	.39	.37	.44
36	.30	.29	.39	.44	.38	.33	.41	.43	.40	.44	.43	.47	.34	.43	.39	.49	.49	.39	.39	.45	.41	.39	.39	.53	.39	.48	.33	.37	.47	.39	.37	.41	.49	.53	.43	.1	.59	.49	.46	.42
37	.39	.42	.53	.51	.49	.43	.53	.51	.42	.54	.50	.49	.31	.55	.51	.51	.45	.48	.46	.56	.58	.53	.35	.62	.45	.62	.37	.50	.66	.52	.47	.52	.54	.62	.50	.59	1	.52	.48	.46
38	.36	.16	.38	.28	.35	.12	.26	.22	.26	.36	.37	.38	.09	.48	.29	.34	.19	.41	.35	.26	.25	.23	.16	.41	.17	.41	.21	.56	.42	.37	.16	.46	.21	.59	.39	.49	.52	1	.12	.63
39	.25	.19	.32	.30	.31	.21	.20	.22	.24	.38	.35	.35	.14	.40	.25	.36	.17	.31	.26	.26	.23	.24	.18	.32	.12	.33	.17	.47	.45	.31	.16	.34	.19	.50	.37	.46	.48	.12	1	.56
40	.39	.21	.39	.22	.32	.15	.25	.24	.37	.42	.42	.43	.21	.42	.30	.36	.19	.47	.39	.26	.26	.34	.18	.32	.19	.38	.24	.49	.46	.39	.22	.46	.19	.53	.44	.42	.46	.63	.56	1

Compared to the earlier factor analysis study done with nursing faculty members (Beitz & Beckmann, 2021b), this study resulted in 8 items being re-located to poor administrative response/bullying organizational characteristics. The items moved were mostly from covert bullying behaviors being considered as characteristics of bullying institutions/organizations. The re-located items were numbers 1, 3, 10, 11, 12, 26, 29, and 35.

Discussion

Academic social bullying is a phenomenon affecting health sciences faculty. Though extant literature is sparse, both quantitative and qualitative results support that it is happening and that a validated psychometrically sound instrument is needed. Barrett-Pugh & Krestelica (2018) acknowledged that universities have developed anti-bullying policies, but a substantial divide exists between what is said versus what is actually done. Results of the current study and previous research (Beitz & Beckmann, 2021b) support that university human resources (HR) departments do not serve to support bullied faculty. The lack of legal recognition of and protection from workplace bullying as a protected category like racial or sexual discrimination may play a role (Mahmoudi & Moss, 2020; Matt, 2012). Workplace bullying is so challenging that a Cochrane Review on preventive interventions has been published (Gillen et al., 2017).

The de novo scale designed explicitly to measure academic social bullying has construct validity evidence with two underlying factors possessing strong reliability for the total scale and for each factor when used with health science educators. This two-factor structure was different from the previously tested three-factor construct validation (Beitz & Beckmann, 2021) obtained with nursing faculty. However, original theoretical structure of the scale was a two-factor model of academic bullying behaviors and organizational characteristics (administrative aspects). The scale utilized a definition of academic social bullying based on content validity index validation in two studies (Beitz & Beckmann, 2021a; Beitz & Beckmann, 2021b). The scale provides a psychometrically sound measure of academic social bullying that has been tested with both nursing and health sciences faculty in higher education.

Limitations

Several limitations affect this study. With a response rate of approximately 10%, the sample is self-selected and represents health sciences educators. The respondents may not represent the bulk of health sciences faculty. The sample was largely occupational therapists, social workers, physical therapists, and pharmacists though over nine disciplines were represented. Participants were mainly from baccalaureate and higher degree programs located in urban and suburban locales. Rural schools may differ in the prevalence and nature of bullying.

The sample size for the EFA ($N = 417$) is considered "good" (Williams et al, 2010). Henson and Roberts (2006) suggest that sample size is less of an issue when each factor is represented by several items (the case here) and when communalities are mostly high ($> .60$) (the case for most items in the two factor CFA). The sample (which varied from 284 to 276 on item responses) to variable ratio (N: p Ratio) (number of subjects in the sample and the number of items) was approximately 7.1:1 to 6.9:1 well within the range recommended (Williams et al., 2010).

Conclusions

Academic social bullying is affecting well-being and retention of health sciences faculty. This study provided evidence for a construct-validated, reliable instrument tested with health sciences educators in measuring academic social bullying. Two factors, bullying behaviors (overt and covert) and poor administrative response/bullying facilitation/organizational characteristics), underlie the scale. Further research is needed to examine how health sciences faculty bullying experiences affect their worksites and if it may transfer to clinical practice settings. Future research can test the instrument with combined health sciences and nursing faculty across levels of education. Hopefully, future researchers will use it to further analyze this noxious phenomenon and provide meaningful interventions for it.

References

Anjum, A., & Muazzam, A. (2018). Workplace bullying and turnover intention among university teachers. *Journal of Arts and Social Sciences, 2*, 51-62.

Aranda, J. L. (2018). Civility and bullying in higher education: Secrets in academia and the culture of incivility. Dissertation: University of South Dakota. Proquest. http://gateway.prquest.com.proxy.libraries.rutgers.edu/openurl?url_ver=z39.88-2004+RFT_FMT=info:OFI/FMT:Kev:MTX:dissertation&res_dat=xri.pqmdrft_dat=xri;pqdiss:10784878

Arnetz, J. E., Fitzpatrick, L., Cotton, S., Jodoin, C., & Chang, C. (2019). Workplace bullying among nurses: Developing a model for intervention. *Violence & Victims, 34*(2), 346-362. https://doi.org/10.1891/0886-6708.VV-D-17-00211

Arnetz, J. E., Sudan, S., Fitzpatrick, L., Cotten, S., Judoin, C., Chang, C., & Arnetz, B. (2018). Organizational determinants of bullying and work disengagement among hospital nurses. *Journal of Advanced Nursing, 75*, 1229-1238. https://doi.org/10.1111/jan.13915

Barratt-Pugh, L. G. B. & Krestelica, D. (2019). Bullying in higher education: Culture change requires more than policy. *Perspectives: Policy and Practice in Higher Education, 23*(2/3) 109-114. http://dx.doi.org.proxy.libraries.rutgers.edu/10.1080/13603108.2018.1502211

Beckmann C. A., Cannella, B. L., & Wantland, D. (2013). Faculty perception of bullying in schools of Nursing. *Journal of Professional Nursing, 29*(5), 287-29 https://doi.org/10.1016/j.profnurs.2012.05.012

Beitz, J., & Beckmann, C. (2021a). Psychometric development of an instrument measuring social bullying in academia: Phase one: Item development and initial content validation. *Nurse Educator, 46*(3), E45. https://doi.org/10.1097/NNE.0000000000000907

Beitz, J., & Beckmann, C. (2021b). Psychometric development of an instrument measuring academic social bullying in nursing higher education: Continuing content and construct validation. *Journal of Nursing Measurement* (In Press).

Cassidy, W., Faucher, C., & Jackson, M. (2014). The dark side of the ivory tower: Cyber bullying of university faculty and teaching personnel. *Alberta Journal of Educational Research, 60*, 279-299. http://ajer.synergiesprairies.ca/index.php/ajer/article/view/1250

Cassidy, W., Faucher, C., & Jackson, M. (2017). Adversity in university: Cyberbullying and its impact on students, faculty, and administrators. *International Journal of Environmental Research and Public Health, 14*(8), 888. https://doi.org/10.3390/ijerph14080888

Clark, C. M., Olender, L., Kenski, D., & Cardoni, C. (2013). Exploring and addressing faculty-to-faculty incivility: A national perspective and literature review. *Journal of Nursing Education, 52*(4), 211-218. https://doi.org/10.3928/01484834-20130319-01

Clark, C. M., Barbosa-Leiker, C., Gill, L. M., & Nguyen, D. (2015). Revision and psychometric testing of the Incivility in Nursing Education (INE) Survey: Introducing the INE-R. *Journal of Nursing Education, 54*(6), 306-315. https://doi.org/10.3928/01484834-20150515-01

Clark, C. M., Sattler, V. P., & Barbosa-Leiker, C. (2018). Development and psychometric testing of the Workplace Civility Index: A reliable tool for measuring civility in the workplace. *Journal of Continuing Education in Nursing, 49*(9), 400-406. https://doi.org/10.3928/00220124-20180813-05

Conco, D. N., Baldwin-Ragaven, L., Christofides, N. J., Libhaber, E., Rispel, L. C., White, J. A., & Kramer, B. (2021). Experiences of workplace bullying among academics in a health sciences faculty at a South African University. *South African Medical Journal, 111*(4), 315-320. https://doi.org/10.7196/SAMJ.2021.v111i4.15319

Costello, A. B., & Osborne, J. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment Research & Evaluation, 10*(7), 1-9. http://pareonline.net/getva.asp?v=10&n=7

Dzurec, L. C. (2013). Status limbo: Analysis of nurse faculty member reports of administrator response to workplace bullying complaints. *Journal of Professional Nursing, 29*(5), E1-E9. https://doi.org/10.1016/j.profnurs.2013.07.001

Dzurec, L. C., Kennison, M., & Albataineh, R. (2014). Unacknowledged threats proffered "in a manner of speaking": Recognizing workplace bullying as shaming. *Journal of Nursing Scholarship, 46*(4), 281-291. https://doi.org/10.1111/jnu.12080

Feeg, V. D., Buonaguro, R., & Mancino, D. (2021). Nurse faculty bullied before Covid: A continuation of "same old, same old" or more? *Dean's Notes, 42*(3), 1-8.

Gillen, P. A., Sinclair, M., Kernohan, W. G., Begley, C. M., & Luyben, A. G. (2017). Interventions for prevention of bullying in the workplace. *Cochrane Database of Systematic Reviews, 1*, Art. No. CD009778. https://doi.org/10.1002/14651858.CD009778.pub2.

Goldberg, E., Beitz, J., Wieland, D., & Levine, C. (2013). Social bullying in nursing academia. *Nurse Educator, 38*(5), 1-7. https://doi.org/10.1097/NNE.0b013e3182a0e5a0

Henson, R. K., & Roberts, J. K. (2006). Use of exploratory factor analysis in published research: Common errors and some comments on improved practice. *Educational and Psychological Measurement, 66*(3), 402-410. http://dx.doi.org.proxy.libraries.rutgers.edu/10.1177/0013164405282485

Hinkin, T. R., Tracey, J. B., & Lenz, C. (1997). Scale construction: Developing valid and reliable measurement instruments. *Journal of Hospitality and Tourism Research, 21*(1), 100-120.

Hodgins, M., & McNamara, P. M. (2019). An enlightened environment? Workplace bullying and incivility in Irish higher education. *Sage Open*, October-December, 1-13. https://doi.org/10.1177/2158244019894278.

Hollis, L. P. (2019). Analysis of faculty wellness and workplace bullying. SIG-faculty teaching evaluation & development. *2019 AERA Conference Meeting/Peer Reviewed Submission*. April 6, 2019, Ontario, Canada.

Hollis, L. P. (2015). Bully university? The cost of workplace bullying and employee disengagement in American higher education. *Sage Open,* April-June, 1-11. https://doi.org/10.1177/2158244015589997

Karpetis, G. (2019). Aggression in the academic workplace: A psychodynamic analysis of social work. *Journal of Social Work Practice, 33*(3), 311-324. https://doi.org/10.1080/02650533.2018.1478394

Larsen, R. & Warne, R. T. (2010). Estimating confidence intervals for eigenvalues in exploratory factor analysis. *Behavior Research Methods, 42*(3), 871-876. https://doi.org/10.3758/BRM.42.3.871

Lynn, M. R. (1986). Determination and quantification of content validity. *Nursing Research, 35*, 382-385.

Mahmoudi, M., Ameli, S., & Moss, S. (2020). The urgent need for modification of scientific ranking indexes to facilitate scientific progress and diminish academic bullying. *Bioimpacts, 10*(1), 5-7. https://doi.org/10.15171/bi.2019.30

Mahmoudi, M., & Keashly, L. (2020). Covid-19 pandemic may fuel academic bullying. *BioImpacts, 10*(3), 139-140. https://doi.org/10.34172/bi.2020.17

Mahmoudi, M., & Moss, S. (2020). The absence of legal remedies following academic bullying. *Bioimpacts, 10*(2), 63-64. https://doi.org/10.34172/bi.2020.08

Matt, S. B. (2012). Ethical and legal issues associated with bullying in nursing profession. *Journal of Nursing Law, 15*(1) 9-13. https://doi.org/10.1891/1073-7472.15.1.9

Merilainen M, & Koiv, K. R. (2019). Theoretical dimensions of bullying and inappropriate behaviour among faculty members. *Scandinavian Journal of Educational Research, 63*(3), 378-392. https://doi.10.1080/00313831.2017.1376349

Merilainen, M., Kayhko, K., Koiv, K., & Sinkkonen, H. M. (2019). Academic bullying among faculty personnel in Estonia and Finland. *Journal of Higher Education Policy and Management, 41*(3), 241-261. http://dx.doi.org.proxy.libraries.rutgers.edu/10.1080/1360080X.2019.1591678

Merilainen, M., Nissinen, P., & Koiv, K. (2019). Intention to leave among bullied university personnel. *International Journal of Educational Management, 33*(7), 1686-1704. https://doi.org/10.1108/IJEM-01-2018-0038.

Pheko, M. M. (2018). Autoethnography and cognitive adaptation: Two powerful buffers against the negative consequences of workplace bullying and academic mobbing. *International Journal of Qualitative Studies on Health and Well-Being, 13*, 1459134. https://doi.org/10.1080/17482631.2018.1459134.

Piotrowski, C., & King, C. (2016). The enigma of adult bullying in higher education: A research-based conceptual framework. *Education, 136*(3), 299-306.

Polit, D. F., & Beck, C. T. (2006). The Content Validity Index: Are you sure you know what's being reported? Critique and recommendations. *Research in Nursing & Health, 29*,489-497. https://doi.org/10.1002/nur.20147

Polit, D. F., & Beck, C. T. (2021). *Nursing research: Generating evidence for nursing practice.* Wolters Kluwer.

Polit, D. F., Beck, C. T., & Owen, S.V. (2007). Focus on research methods. Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health, 30*, 459-467. https://doi.org/10.1002/nur.20199

Reigle, R. (2016). Bullying of adjunct faculty at community colleges and steps toward resolution. *Online Submission*, 12 pages. Accession number: ED563989.

Simpson, R., & Cohen, C. (2004). Dangerous work: The gendered nature of bullying in the context of higher education. *Gender, Work, and Organization, 11*(2), 163-186. https://doi.org/10.1111/j.1468-0432.2004.00227.x

Singh, C., Cross, W., Munro, I., & Jackson, P. (2018). Occupational stress facing nurse academics-A mixed methods systematic review. *Journal of Clinical Nursing, 29*, 720-735. https://doi.org/10.1111/jocn.15150

Stoffel, J. M., & Cain, J. (2018). Review of grit and resilience literature within health professions education. *American Journal of Pharmaceutical Education, 82*(2), Article 6150, 124-134. https://doi.org/10.56https://doi.org/88/ajpe6150

Symons, M. M., DiCarlo, H., & Caboral-Stevens, M. (2020). Workplace cyberbullying exposed: A concept analysis. *Nursing Forum, 56*, 141-150. https://doi.org/10.1111/nuf.12505

UCLA Institute for Digital Research and Education (2020). A practical introduction factor analysis: Exploratory factor analysis. Retrieved 2/27/2020 from https://stats.idre.ucla.edu/spss/seminars/introduction-to-factor-analysis/a-practical-introduction-to-factor-analysis

UCLA Institute for Digital Research and Education (2020). A practical introduction to factor analysis: Confirmatory factor analysis. Retrieved 2/27/2020 from https://stats.idre.ucla.edu/spss/seminars/introduction-to-factor-analysis/a-practical-introduction-to-factor-analysis-confirmatory-factor-analysis

Wieland, D., & Beitz, J. (2015). Resilience to social bullying in academia: A phenomenological study. *Nurse Educator, 40*(6), 289-293. https://doi.org10.1097/NNE.0000000000000169

Williams, B., Onsman, A., & Brown, T. (2010). Exploratory factor analysis: A five-step guide for novices. *Journal of Emergency Primary Health Care, 8*(3), Article 990399, 1-13.

Wunnenberg, M. (2020). Psychosocial bullying among nurse educators: Exploring coping strategies and intent to leave. *Journal of Nursing Scholarship, 52*(5), 574-582. https://doi.org/10.1111/jnu.12581

JOURNAL OF NURSING PRACTICE APPLICATIONS & REVIEWS OF RESEARCH

Evidence-Based Practice: Comparison and Continuing Education Needs of Internationally Educated Hospital-Based Nurses (IENs) and Home Healthcare Nurses (HHNs) in the United States

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Conflict of Interest
The authors declare that there is no conflict of interest.

Abstract

Background: Understanding nurses' attitudes and engagement in evidence-based practice (EBP) is a crucial step in identifying the type of training and support needed by frontline nurses when planning and implementing EBP education in actual practice settings.

Objectives: This study explored the similarities and differences between the home healthcare nurses (HHNs) and internationally educated hospital-based nurses (IENs) that participated in two previous studies.

Methods: In this comparative analysis, there were 173 nurses (HHNs, $n = 78$; IENs, $n = 95$) included. The two previously reported studies had similar research designs, sampling plans, and metrics to assess EBP attitudes of nurses. One study focused on hospital-based IENs; the other study focused on HHNs. Both studies used the Nurses Attitudes Toward EBP Scale (NATES).

Results: IENs and HHNs have a positive attitude towards EBP. Both groups report low EBP engagement; however, HHNs reported lower level of engagement than IENs.

Conclusions: This analysis contributes to the body of nursing knowledge surrounding evidence-based practice, as it confirms findings from other studies highlighting positive EBP attitudes and limited EBP engagement. All nurses, including IENs and HHNs, need to be provided opportunities to undergo structured EBP training and involvement in EBP committees and activities.

Keywords: Evidence-based practice, internationally educated RNs, home healthcare nurses, comparative analysis

Introduction

Evidence-based practice (EBP) is not a new concept; Florence Nightingale was a proponent in the 1800s when observations prompted her to collect data on disease pathways and infection rates (Ellis, 2020). Florence's attention and articulation of 'the data' (evidence) led to changes in sanitation standards in military and civilian hospitals. Over two hundred years later, a report from the Institute of Medicine (IOM) announced EBP as an essential core competency in the education of all health professionals and to hospital accreditation (Greiner & Knebel, 2003). Recently, the American Association of Colleges of Nursing (2021) reaffirmed the role of EBP in the "Essentials". Yet, despite the endorsement from the IOM and AACN, and the research supported benefits, EBP is inconsistently employed by nurses (Melnyk et al., 2018).

Frontline nurses (both acute care and HHN) are essential to the healthcare workforce. Nurse educators have a responsibility to ensure that nurses, regardless of work site (i.e. acute care, home health) improve healthcare outcomes and decrease healthcare costs. Understanding nurses' perceptions of and engagement in EBP is a crucial step in identifying the type of training and support needed by frontline nurses (Melnyk, 2018).

The analysis below makes a new contribution to nursing by comparing EBP attitudes and engagement of two unique populations practicing in the United States, internationally educated acute care nurses and home healthcare nurses (HHNs). In addition, this study offers recommendations to nursing management and other healthcare organization stakeholders and addresses the need for continued nursing education, utilization of EBP best practice strategies, and further research.

Literature Search/Review

No published studies were found that directly compare the attitudes towards and engagement with EBP of internationally educated nurses (IENs) working in the United States (U.S.) with HHNs employed in the U.S. Additionally, there are few recent studies addressing HHNs' perceptions of and engagement with EBP, including the study in this comparison. Although the amount of current literature is sparse, findings among the studies are consistent. Nurses report positive attitudes towards EBP but inadequate knowledge and minimal implementation during clinical practice (Jarrin et al., 2019; Li et al., 2019; Pereira et al., 2018). Li et al. (2019) conducted a systematic review synthesizing community nurses' EBP attitudes, knowledge, and implementation. Twenty articles, ranging in date from 2004 to 2018, were included in the review, with most of the studies ($n = 11$) consisting of cross-sectional surveys. The review found that community nurses had insufficient knowledge of EBP and were unprepared to implement it, although they held positive attitudes and beliefs about the benefits of EBP. Researchers recommended nurse leaders focus on improving knowledge translation. The most current study included in the systematic review supported the overall findings (Pereira et al., 2018). Pereira et al. (2018) studied the beliefs and implementation of EBP among community health nurses in Switzerland. Nurse beliefs about the benefits of EBP scored highest ($M = 4.05$) on the EBP Beliefs Scale (5-point Likert scale; 5 = strongly agree), and items questioning nurse knowledge about EBP processes and implementation scored the lowest ($M = 2.75$). Significantly, survey respondents reported implementing EBP between zero and three times during the preceding eight weeks. Finally, a qualitative content analysis of international respondents from 17 countries, including the Philippines and the U.S., identified priorities for education, research, and practice of home care nurses that support the findings above (Jarrin et al., 2019). Among the four themes and 16 sub-themes that emerged from the analysis was a call to action to "generate and use evidence-based guidelines for home care" (p. 85). Participants stressed the need for EBP education for home care providers and integration of evidence into home care practice.

The literature addressing EBP attitudes and engagement of IENs working in the U.S. is sparse. The lone study conducted by Ko & Thiel (2017) found the attitudes of IEN to be positive; however, EBP engagement was rare. EBP engagement in the study was operationalized as action-focused and included EBP projects or committees, attending EBP workshops/classes, research, and EBP mentoring. In contrast, several current studies address EBP attitudes, knowledge and skills, and engagement of nurses educated and practicing outside of the U.S. Attitudes towards EBP varied in these studies. Studies conducted in Oman and the Philippines found attitudes to be generally positive, but EBP knowledge and implementation were lacking (Al-Busaidi et al., 2019; Al-Maskari & Patterson, 2018; Lumanlan, 2018). Al-Busaidi et al. (2019) surveyed nurses working in Oman using the Evidence Based Practice Questionnaire (EBPQ), which employs a seven-point Likert scale to measure attitudes, knowledge, and skills, and EBP practice. Higher scores represented positive responses, and responses that scored between one and four were considered negative. Overall, investigators found the EBP attitudes section received the highest mean score ($M = 5.5$; $SD \pm 1.2$). While the knowledge/skills section ($M = 4.9$; $SD \pm 0.8$) and the practice section ($M = 4.7$; $SD \pm 1.2$) scored above a mean of four overall, each containing elements for which over 50% of the respondents indicated a negative score. "Research skills" (57.7%) and "converting information needs into a question" (51.0%) were identified as the most pressing knowledge deficits, and "critically appraise literature" (62.8%), "track down relevant evidence" (54.0%), and "formulate clear question" (57.3%) were

The NATES measures nurses' attitudes toward EBP. It consists of 14 attitudinal statements (items), which are measured on a scale from 1 (strongly disagree) to 5 (strongly agree). Overall, an attitudinal score can range between 14 and 70. Negative statements require reverse coding. A higher EBP score indicates a more positive attitude. NATES has previously established validity and reliability or internal consistency (Thiel & Gosh, 2008). Reliability is good with reported Cronbach alphas above > 0.85 (Ko & Thiel, 2017; Thiel et. al, 2019).

Analysis: Study 1 (IEN) and Study 2 (HHN)
At the time of the original studies, statistical analysis was completed using SPSS version 21 software for Study 1 and version 23 for Study 2. Prior to beginning this comparative analysis, data from each comparison study were screened for accuracy. No corrections were made. Each study was reviewed and analyzed independently and then across studies. The chi-square test was used to detect differences between studies for data at the nominal and ordinal levels, while the t-test determined mean differences of data at the interval level. Significant difference would indicate a difference or dissimilarity between population variables. A 5% level of significance and 95% confidence level were used throughout comparative analysis of the parent-studies.

Results of Parent-Studies
Demographics
Age, Gender, Race/Ethnicity, Worksite (see Table 1). In total, 173 nurses (HHN, $n = 78$; IEN, $n = 95$) were included in this two-study analysis. Participants ranged between 23 and 72 years old. The mean age of HHNs was 41.37 years and for IEN 43.09 years. The variable gender was not statistically significant ($\chi2 = 1.77$, $p = 0.249$) between populations. Race/ethnicity was measured using six categories. The two highest categories in the HHN population were Hispanic/Latino (36.6%, $n = 34$) and Asian (31.2%, $n = 28$). One hundred percent ($n = 78$) of the IENs indicated ethnicity as Asian. Each study measured the variable 'worksite' differently; therefore, comparisons could not be generated. The vast majority (97.8%, $n = 90$) of HHNs reported working in 'independent home healthcare' agencies; IENs indicated 'hospital nursing' (92.3%, $n = 72$) (see Table 1). The 'race/ethnicity' and 'worksite' variables included multiple zero cells, which did not allow for probability (chi-square) analysis. Analysis indicated demographics 'age' and 'gender' were similar between populations; whereas, 'race/ethnicity' and 'worksite' were dissimilar.

Highest Nursing Degree, Years as an R.N., Nursing Position, State of Licensure
Overall, the majority of respondents of each study indicated the BSN as their 'highest nursing degree'; however, there was distinct population category variability. The HHN population had greater variability among education categories

(AD, diploma, BSN, Master's) than the IEN population. See Table 1. Results of the chi-square analysis indicated a significant difference (proportion) between the two populations ($\chi2 = 30.12$, $p = < 0.0001$). The variable 'number of years worked as an RN in the U.S.' revealed a significant difference ($t = 2.73$, $p < 0.007$) between the HHN ($M = 11.80$) and IEN ($M = 15.15$) populations. The variable 'nursing position' was measured using six categories (see Table 1). The result of chi-square analysis indicated a significant difference (proportion) between populations ($\chi2 = 10.65$, $p = 0.03$). The 'staff nurse' position received the highest frequency in both populations. The variable 'states of RN licensure' was collapsed into regions. The two highest regions for the HHN population were Western (44.3%, $n = 43$) and Southwestern Regions (40.3%, $n = 39$), while the entire IEN population indicated the Southern Region (100%, $n = 78$); 100% indicating Texas. Analysis indicated the demographics 'nursing degree,' 'years as an RN,' 'nursing position,' and 'state of RN licensure' were dissimilar between populations.

Nurses' Attitudes and Engagement in EBP
Nurses' attitudes were measured using the NATES tool. Participants of each group were asked to respond to the same 14 items (see selected items in Table 2). The comparison studies revealed positive attitudes toward EBP (score > 50), although this finding was at the lower end of the positive range (50 - 70). The mean NATES score difference between HHN population ($M = 52.79$, $SD = 8.56$) and IEN population ($M = 56.63$, $SD = 6.86$) was found to be statistically significant ($t = -3.27$, $p = 0.001$), suggesting EBP attitudes differed between studies. Summative scores were higher in the IEN population. When asked to respond to the question 'I have enough knowledge to engage in EBP,' 30.5% of the HHNs responded either uncertain, disagreed, or strongly disagree, compared to 20% of IEN nurses. When asked, 'It is important that EBP is incorporated into nursing,' 14% of HHNs indicated either uncertain, disagreed, or strongly disagree 14.1% compared to IEN reporting at 9%. See Table 2 for selected item descriptive and statistics.

Overall, EBP engagement was measured using a dichotomous "yes" and "no" response. Engagement was conceptualized as involvement in an EBP committee, EBP counsel, or an EBP initiative. Although the question between studies was similar, time consideration varied. The IEN population was asked: "Over the past three years, have you been involved in a nursing committee(s) or initiative(s) which incorporated EBP into patient care?" whereas, the HHN population was asked, "In the last six months... have you been involved in an EBP committee or council?" Analysis revealed a higher proportion of 'yes' responses (last six months) in the HHN (23.9%) population than 'yes' responses (last three years) in the IEN population (29.5%). See Table 2 for descriptive statistics of selected items.

Table 1

Demographic Characteristics of each Parent Study: Home Healthcare Nurse (HHN) and Internationally Educated Nurse (IEN)

Demographic Characteristics	HHN (N = 95)	IEN (N = 78)
Age	M = 41.37 (SD = 11.02) Range 23-70	M = 43.09 (SD = 9.62) Range 25-72
Years as RN	M = 11.8 (SD = 7.8)	M = 15.15 (SD = 8.30)
Gender χ^2 = 1.77 p = 0.249	**HHN** n (%)	**IEN** n (%)
Male	26 (28.0)	15 (19.2)
Female	67 (68.9)	63 (80.8)
Race/Ethnicity		
Black or African American	7 (7.5)	0
Asian	29 (31.2)	78 (100)
White	21 (22.6)	0
American Indian/Alaska Native/ Pacific Islander	2 (2.2)	0
Hispanic or Latino	34 (36.6)	0
Highest Level of Nursing Education χ^2 = 30.12, p < 0.0001		
Associate degree	16 (17.4)	1 (1.3)
Diploma	18 (19.6)	1 (1.3)
B.S.N.	51 (55.5)	69 (88.5)
Master's degree	7 (7.6)	6 (7.7)
Nursing Position χ^2 = 10.65, p = 0.03		
Staff Nurse	72 (79.1)	68 (87.2)
Case Mgr./Nurse Mgr./Admin	13 (14.3)	1 (1.13)
Nurse Practitioner/CNS	2 (2.2)	2 (2.6)
Nurse Educator	3 (3.3)	6 (7.6)
Clinical Coordination/Quality Assurance	2 (2.2)	1 (1.3)
Worksite		
Independent Home healthcare	90 (97.8)	-
Hospice/Palliative care	1 (1.0)	-
Public health	1 (1.0)	-
Education	-	4 (5.1)
Home Health Agency	-	1 (1.3)
Hospital Nursing	-	72 (92.3)
Long-Term Care/Nursing	-	1 (1.3)

Table 2

Comparison of Home Healthcare Nurse (HHN) and Internationally Educated Nurse (IEN) Scores on Selected NATES Items

Item	Site	Strongly Disagree n (%)	Disagree n (%)	Neutral/ Uncertain n (%)	Agree n (%)	Strongly Agree n (%)	Mean (SD)
I have enough knowledge to engage in EBP	IEN	1 (1.3)	2 (2.7)	12 (16.0)	49 (65.3)	11 (14.7)	3.89 (1.01)
	HHN	1 (1.1)	10 (10.9)	17 (18.5)	29 (31.5)	35 (38.0)	3.94 (1.05)
EBP is a fad and will pass with time… no reason to adopt EBP…[a]	IEN	33 (42.3)	38 (48.7)	3 (3.8)	2 (2.6)	2 (2.6)	4.26[a] (0.859)
	HHN	33 (35.9)	46 (50.0)	10 (10.9)	1 (2.2)	1 (1.1)	4.09[a] (0.79)
I believe in EBP	IEN	2 (2.6)	1 (1.3)	5 (6.4)	34 (43.2)	36 (46.2)	4.29 (0.854)
	HHN	2 (2.2)	10 (11.0)	17 (18.7)	37 (40.7)	25 (27.5)	3.8 (1.03)
Engaging in EBP will help me provide quality nursing care	IEN	2 (2.6)	1 (1.3)	5 (6.4)	44 (56.4)	26 (33.3)	4.17 (0.81)
	HHN	1 (1.1)	11 (12.1)	18 (19.8)	51 (56.0)	10 (11.0)	3.63 (0.87)
EBP ignores the art of nursing. [A]	IEN	25 (32.5)	43 (55.8)	7 (9.1)	2 (2.6)	0 (0)	4.18[a] (0.70)
	HHN	19 (21.1)	32 (35.6)	14 (15.6)	16 (17.8)	9 (9.3)	3.40[a] (1.27)
Using evidence…increases certainty patient outcomes will be met.	IEN	1 (1.3)	1 (1.3)	9 (11.5)	51 (65.4)	16 (20.5)	4.03 (0.70)
	HHN	2 (2.2)	3 (3.2)	14 (15.1)	40 (43.0)	34 (36.6)	4.08 (0.91)
It is important that EBP is incorporated into nursing.	IEN	2 (2.6)	0 (0)	5 (6.4)	51 (65.4)	20 (25.6)	4.12 (0.73)
	HHN	1 (1.1)	2 (2.2)	10 (10.8)	46 (49.5)	34 (36.6)	4.18 (0.79)

[a]*Negatively written item score was reverse coded.*

Discussion

This analysis contributes to the body of nursing knowledge surrounding EBP, as it confirms findings from other studies highlighting positive EBP attitudes and limited EBP engagement. This analysis makes a new contribution to nursing by comparing EBP attitudes and engagement of two unique populations, IENs and HHNs, in the United States. This analysis offers recommendations targeted toward agencies/organizations, continued nursing education initiatives, and further research.

Based on the analysis of both comparative studies, the majority of the respondents were in staff nursing positions. It was probable that the survey questionnaires were distributed to acquaintances and colleagues who were mostly in staff nursing positions in both settings. It was observed

in both studies there was limited participation from nurse leaders (i.e., managers/administrators). Adequate sample representation of nurse managers/administrators is advantageous, facilitating practice change and improvement in clinical and organizational outcomes. Nurse managers play pivotal roles in serving as EBP champions, sustaining an outcome driven EBP culture, and ensuring provision for ongoing EBP education of nurses.

Demographics

The data of both studies indicated the majority of respondents have BSN degrees. The high percentage of BSN degree holders in IENs as compared to HHNs is attributed to where they completed their nursing degree. Inclusion criteria for IEN participation was completion of nursing degree outside of the United States. For many IENs, "regarding educational degree attainment, reports of BSN degrees in the studies were consistently higher than the proportion of U.S. educated RNs educated at the BSN level" (Ghazal et al., 2020, p. 378). The data also revealed a limited number of respondents with master's degrees. This demographic feature is attributed to the limited number of advanced practice nurses and nurse administrators participating in the studies.

IENs and HHNs were asked the number of years that they have worked as RNs in the United States; however, the questionnaires did not inquire into the extent of EBP education respondents had received. As further studies are conducted, gaining information regarding integration of EBP into IENs and HHNs' nursing curriculum and type of EBP experience prior to migrating to the U.S. or working as HHNs may have important information in assessing IENs' and HHNs' perceptions and attitudes toward EBP.

The variable 'state of RN licensure' confounded similarity between studies. RN licenses in the HHN population were primarily from the Western and Southwestern Regions while the IEN study participants were all licensed in Texas. This finding is attributed to the manner in which the HHN survey was conducted.

Attitudes Toward EBP and EBP Engagement

The result of the comparison between the two studies revealed a positive attitude towards EBP. This positive attitude is similar to other studies conducted (Al-Busaidi et al., 2019; Al-Maskari & Patterson, 2018; Lumanlan, 2018; Thiel & Gosh, 2008). In addition, study findings indicate HHNs are interested in learning and becoming EBP champions (Thiel, et al., 2019). Although both populations indicated a need for EBP education, HHN scores were lower than IEN scores. Additionally, the scores associated with the belief that incorporating EBP into nursing is important was lower for HHNs than IENs. These findings suggest attention be directed toward institutional EBP culture and ongoing education.

The low level of actual engagement in EBP of each study was not surprising and has been reported elsewhere (Arde, 2018; Pereira et al., 2018). The EBP engagement question was asked in two different time periods. In the IENs' study, the time period of engagement was asked "over the past three years." In the HHNs' study, the time period was "over the last six months." HHNs received a higher "yes" response compared to IENs. There is a possibility that the response from the two parent studies may have been affected by the memory recall of two separate time periods. Additionally, the wide time variation between the study questions, likely dissuades a meaningful comparison variable.

Limitations of the study are noteworthy. Most respondents in the parent studies were staff nurses and sample sizes were small. Therefore, caution needs to be considered when generalizing the result of the study, which is not representative of the larger population or diverse nursing positions.

Education and Training

Nurse EBP education and training is an important element in a successful EBP implementation. Table 3 provides initiatives in developing EBP education and training. It includes items from EBP proposal development to lessons learned for future training improvements to the importance of academic and practice EBP partnerships. Many health sciences librarians have received EBP education and training and can be a useful resource or training partner. It is apparent from the nurses that participated in both studies that they are interested in EBP training.

Conclusions

IENs and HHNs have a positive attitude towards EBP; however, both groups report low EBP engagement. All nurses, including IENs and HHNs, need to be given opportunities to undergo structured EBP training and involvement in EBP committees and activities. Engagement exposes the front-line nurse to prioritizing initiatives and organizational benchmarks (i.e., reduction in infection rates). Assessing nurse managers' support of EBP education and training is important as the role is critical to ensuring standards of care. In addition, lack of EBP education and training is a major obstacle. Supporting EBP initiatives and continuous education within organizations will enable nurses to assist in improving health outcomes and the patient's experience. Raising awareness and improving EBP competencies of nurse managers and educators is essential in the success of EBP implementation and the imperative to becoming a consistent norm in nursing and healthcare systems worldwide. The growing need for improved health outcomes is expected in the healthcare industry. This expectation further impacts the importance of EBP geared towards clinicians, patients, and support for best practice. The impact of EBP in practice settings is aligned with stakeholders' championing initiatives that improve outcomes. Nursing management support,

Table 3

Ten Initiatives to Facilitate EBP Education and Training

Initiatives	Content information
1. EBP training proposal	Develop training proposal. This proposal includes the importance of the EBP training in enhancing total patient experience and improvements in health care outcomes.
2. Administrative support and EBP champions	Seek administrative support and EBP champions within the facility. Support from administration plays a pivotal role in the success of the training. Having EBP champions assist in proactively moving the projects forward with advocates on successful implementation.
3. Goals and Objectives	Develop training goals and objectives specific to EBP training. This initiative may involve development of indicators to measure training goals and objectives.
4. EBP engagement	Actual involvement in EBP projects (i.e., collecting relevant and best available evidence, conducting critical appraisal of gathered evidence, and steps in project implementation).
5. EBP toolkits	Utilize best practice EBP initiatives (tool kits) to facilitate EBP education and implementation.
6. Librarian support	Utilize available librarians to support the needed EBP content and training research needs.
7. Nurse residency training	Expand nurse residency training to include EBP project engagement. This strategy will involve selecting EBP facilitators/coaches to monitor EBP project implementation progress and accomplishment of goals.
8. Evaluation methodology	Develop evaluation methods to determine success of EBP education and training. This approach may involve evaluating the indicators utilized in the initial goal setting to determine training success.
9. Lessons learned	Lessons learned from the initial training to improve future delivery.
10. Academic and Practice EBP partnerships	Partnering with research Universities promotes mutual learning benefits. The practice setting benefits from the new and advanced EBP knowledge from the research Universities. In addition, the academic institutions may provide EBP expert faculty in assisting practice-based nurses in the training and implementation of EBP projects. On the other hand, Academic institutions may send their clinical students and be involved in actual practice based EBP project implementation.

in particular impacts the success of EBP implementation. Thus, the importance of providing administrative and front-line nurses and stakeholders with brainstorming opportunities to explore the reality of EBP engagement, education needs and EBP project implementation will foster supportive outcomes. Ongoing communication of EBP strategies and policies with nursing staff is vital. Opportunities to foster EBP may include addition of EBP citations in policies and procedure manuals, direct EBP highlights during huddles, conscious inclusion in staff meeting minutes, and systematic incorporation in agency electronic databases.

With the growing number of international nurses in the United States and the global advancement of EBP, nursing is moving toward a global EBP competency conversation.

For the conversation to gain momentum further systematic reviews and meta-analyses are necessary to determine similarities and differences of IENs practicing in the United States and globally. The exploration would enable institutions to determine and address gaps for successful application of EBP in institutional settings.

In the home health care arena, there is a need to expand EBP research to the micro-and macro systems with a focus on a larger sample size; data collection to include country of nursing degree; extent of EBP education during undergraduate education; and opportunities for and facilitators to EBP engagement.

References

Al-Busaidi, I. S., Al Suleimani, S. Z., Dupo, J. U., Al Sulaimi, N. K., & Nair, V. G. (2019). Nurses' knowledge, attitudes, and implementation of evidence-based practice in Oman: A multi-institutional, cross-sectional study. *Oman Medical Journal, 34*(6), 521-527. https://doi.org/10.5001/omj.2019.95

Al-Maskari, M. A., & Patterson, B. J. (2018). Attitudes towards and perceptions regarding the implementation of evidence-based practice among Omani nurses. *Sultan Qaboos University Medical Journal, 18*(3), e344-e349. https://doi.org/ 10.18295/squmj.2018.18.03.013

American Association of Colleges of Nursing. (2021). The essentials: *Core competencies for professional nursing education*. https://www.aacnnursing.org/Portals/42/AcademicNursing/pdf/Essentials-2021.pdf

Arde, B. O. A. (2018). Evidence-based practice beliefs and implementation of staff nurses in the Ilocos Region. *Philippine Journal of Nursing, 88*(1), 11-20.

Ellis, H. (2020). Florence Nightingale: Creator of modern nursing and public health pioneer. *Journal of Perioperative Practice, 30*(5), 145–146. https://doi.org/10.1177/175045891985194

Ghazal, L. V., Ma, C., Djukic, M., & Squires, A. (2020). Transition-to-US practice experiences of internationally educated nurses: An integrative review. *Western Journal of Nursing Research, 42*(5), 373-392. https://doi.org/10.1177/0193945919860855

Greiner, A. C., & Knebel, E. (Eds.). (2003). *Health professions education: A bridge to quality* (Institute of Medicine Quality Chasm series). National Academies Press.

Jarrín, O. F., Pouladi, F. A., & Madigan, E. A. (2019). International priorities for home care education, research, practice, and management: Qualitative content analysis. *Nurse Education Today, 73*, 83-87. https://doi.org/10.1016/j.nedt.2018.11.020

Ko, A., & Thiel, L (2017). Foreign educated registered nurses' attitudes toward EBP Practice: A descriptive cross-sectional study. *Journal of Nursing Practice Applications and Reviews of Research, 7*(1), 14-21.

Li, S., Cao, M., & Zhu, X. (2019). Evidence-based practice: Knowledge, attitudes, implementation, facilitators, and barriers among community nurses—systematic review. *Medicine, 98*(39) e17209. https://doi.org/10.1097/MD.0000000000017209

Lumanlan, P. T. (2018). Nurses' value orientation and intention to pursue graduate education and their readiness for evidence-based practice. *Philippine Journal of Nursing, 88*(1),27-32.

Melnyk, B. M., Gallagher-Ford, L., Zellefrow, C., Tucker, S., Thomas, B., Sinnott, L. T., & Tan, A. (2018). The first US study on nurses' evidence-based practice competencies indicates major deficits that threaten healthcare quality, safety, and patient outcomes. *Worldviews on Evidence-Based Nursing, 15*(1), 16-25. https://doi.org/10.1111/wvn.12269

National Center for Health Workforce Analysis. (2019). *Brief summary results from the 2018 national sample survey of registered nurses.* U.S. Department of Health and Human Services, Health Resources and Services Administration Bureau of Health Workforce. https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/nssrn-summary-report.pdf

Pereira, F., Pellaux, V., & Verloo, H. (2018). Beliefs and implementation of evidence-based practice among community health nurses: A cross-sectional descriptive study. *Journal of Clinical Nursing, 27*(9-10), 2052-2061. https://doi.org/10.1111/jocn.14348

Shaffer, F. A., Bakhshi, M. A., Farrell, N., & Álvarez, T. D. (2020). The recruitment experience of foreign-educated health professionals to the United States. *The American Journal of Nursing, 120*(1), 28–38. https://doi.org/10.1097/01.NAJ.0000652024.67027.f7

Thiel, L., & Ghosh, Y. (2008). Determining registered nurses' readiness for evidence-based practice. *Worldviews in Evidence Based Nursing, 5*(4), 182-192.

Thiel, L., Ko, A., & Turner, J. (2019). Home healthcare nurses' attitudes, confidence, and engagement in EBP. *Home Healthcare Now, 37*(2), 79-87.

World Health Organization. (2015). *World report on aging and health.* https://www.who.int/publications/i/item/9789241565042

Youssef, N. F., Alshraifeen, A., Alnuaimi, K., & Upton, P. (2018). Egyptian and Jordanian nurse educators' perception of barriers preventing the implementation of evidence-based practice: A cross-sectional study. *Nurse Education Today, 64*, 33-41. https://doi.org/10.1016/j.nedt.2018.01.035

JOURNAL OF NURSING PRACTICE APPLICATIONS & REVIEWS OF RESEARCH

The Effects of Pre-Operative Activity Tracker Use on Recovery Time in Heart Failure Patients Who Underwent a Heart Transplant

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Conflict of Interest
The authors declare that there is
no conflict of interest.

Abstract

Background: Hospitalized pre-heart transplant patients who are physically active may decrease post-operative length-of-stay. However, these patients seldom ambulate before surgery because of weakness, fatigue, and breathlessness. A previous qualitative study revealed the use of an activity tracker encouraged ambulation in pre–heart transplant patients.

Objective: The purpose of this study was to compare postoperative recovery time between heart transplant patients who wore an activity tracker preoperatively and patients who did not. Recovery time was measured by extubation time, length of cardiovascular intensive care unit (CVICU) stay, length of hospital stay, and time until sitting on the side of the bed, standing, sitting in a chair, and ambulating 10 or more steps.

Methods: This study utilized a mixed methods design. The qualitative portion was reported previously (Macapagal et al., 2021). This article reports on the quantitative portion. A retrospective quasi-experimental design using medical record review was used to compare the post-transplant outcomes of patients who did and did not wear an activity tracker preoperatively. Forty-five medical records were consecutively selected for each patient group.

Results: The final sample size was 84 patients. Three of seven recovery outcomes were significantly different between patients who did and did not wear an activity tracker: (a) time until sitting on side of bed ($p = .040$), (b) time until standing ($p = .019$), and (c) length of stay in the CVICU ($p = .008$).

Conclusion: Wearing an activity tracker pre-operatively may be associated with reduced post-transplant recovery time. Further research is needed using larger samples.

Keywords: activity tracker, post-op recovery time, length of stay. pre-heart transplant

Background

Heart failure (HF) is one of the top chronic diseases in the United States, and its prevalence continues to increase. The American Heart Association ([AHA], 2021) documents that HF has a prevalence of 6.00 million cases among Americans aged 20 years and older. Patients with HF are initially treated with guideline-directed medical therapy (GDMT) (Yancy et al., 2017). Patients who become refractory to GDMT require continuous inotropic infusion and mechanical circulatory support (MCS), such as an intra-aortic balloon pump ([IABP], Kuno et al., 2021), percutaneous left ventricular assist device (Kuno et al., 2021), or left ventricular assist device (Lohmueller et al., 2017). Furthermore, these patients require monitoring of their cardiac function, which necessitates insertion of a pulmonary artery catheter. These procedures require patients to be admitted to the intensive care unit (ICU).

Patients who deteriorate are placed on the heart transplant wait list in the United Network for Organ Sharing (UNOS) former 1A or 2B categories (Liu et al., 2020). The 1A category represents patients with the greatest illness severity and chance of death while awaiting a transplant. They are the highest priority to receive a heart donation (Liu et al., 2020). In late 2018 the three-category UNOS list was changed to a six-category list (Liu et al., 2020). This study used the three-category listing since data was collected in 2017-18, with all patients in the 1A category.

In the United States, HF patients undergo an average of 3499 heart transplantations per year with a cost of $1,664,800 per transplantation (Bentley & Ortner, 2020). This patient population has an average hospital length of stay of 49.2 days, which follows a prolonged pre-transplant stay of an average of 19.1 days in the hospital, usually in the ICU (Bentley & Ortner, 2020).

Physical inactivity is a major risk factor for mortality worldwide, causing an estimated 3.2 million deaths (6%) (DeGroote et al., 2018). Thus, health experts have long recommended everyone to perform a sufficient level of physical activity (PA). Physical activity is defined as "any bodily movement produced by skeletal muscles that require energy expenditure" (DeGroote et al., 2018, p. 2).

Pre-transplant HF patients in the ICU are debilitated, with little motivation to ambulate and perform physical activity, and are tethered to various monitors, cardiac support machines, and intravenous pumps that restrict their movement. Bed rest has a negative effect on all major body systems. Deteriorating muscle function, alterations in lung expansion and perfusion, decreasing cardiac output, embolus formation, frailty and sleep disturbances are just a few of these effects (Kobashigawa et al., 2019; Patnaik et al., 2019). Additional bedrest complications such as ICU-acquired weakness are associated with worse long-term morbidity, mortality, extended ventilator dependency, and longer length of hospital stay. ICU-acquired weakness occurs in 30% to 50% of ICU patients (Li et al., 2020). Depression can also affect these HF patients (Heo et al., 2016).

The pre-transplant condition of a HF patient affects their post-transplant outcomes. Pre-transplant HF patients are weak, fatigue easily, and experience shortness of breath with little exertion (Kapoor & Ju, 2016). A lack of pre-transplant conditioning can be illustrated through the concept of "frailty." Frailty negatively affects immune and neuroendocrine responses and alters cognitive processes. The 1-year actuarial survival rate for frail patients after heart transplantation is 52%, compared to 100% in non-frail patients. Physical therapy and exercise are two interventions that can decrease frailty before the transplant. Ambulation is beneficial in preventing multiple complications (Kobashigawa et al., 2019). Standard preoperative protocol for heart failure patients awaiting a transplant is for nurses to ambulate patients during their stay in the cardiac intensive care unit (CICU) when they are more stable, usually once a day for a maximum of 30 minutes or as tolerated. In a previous study conducted in the same hospital as the current study, nurses used a chart with landmarks and distances to indicate distance ambulated (Macapagal et al., 2019). This form of measuring "distance ambulated" was fraught with errors such as incomplete electronic medical records (EMR) entries, wrong tallies, and patients' confusion over how far they ambulated from one day to the next. Thus, the study principal investigator (PI) introduced the use of an activity tracker (Fitbit™ One Wireless Activity and Sleep Tracker) to allow patients to self-monitor their progress and provide motivation to ambulate (Macapagal et al., 2021).

Activity trackers have been used in different applications to motivate patients with chronic obstructive pulmonary disease (COPD), company employees, and HF patients in outpatient settings (Blondeel et al., 2020; Thorup & Hansen, 2016). Multiple published studies indicate use of activity trackers in health care applications however, no studies were found that used these devices for hospitalized, pre-transplant HF patients (DeGroote et al., 2018; Moayedi, 2017; Singhal & Cowie, 2020; Tan et al., 2019; Thorup & Hansen, 2016; Vetrovsky et al., 2019). Literature has indicated that various forms of activity tracker technology are valid for measuring steps taken in healthy people (DeGroote et al., 2018; Vetrovsky et al., 2019), however, their validity is not generally supported in frail patients with HF who walk with a slow pace (Blondeel et al., 2020; Vetrovsky et al., 2019). Yet, Singhal and Cowie (2020) reported that activity tracker technology can play a predictive role in mortality, hospitalization, and quality of life in HF patients. For example, in one retrospective study of 189 American patients with a self-reported HF diagnosis, results showed that physical ac-

tivity measured by accelerometry was strongly associated with mortality. For every 60 minutes of additional physical activity each day, patients with HF had a 35% reduced risk of mortality (Loprinzi et al., 2016).

With the estimated total charge of $1,664,800 for a heart transplant, and an ICU stay costing $2,325 to $5166 per day, any decrease in ICU and hospital stay is important (Bentley & Ortner, 2020; Gershenghorn et al., 2015). Thus, if wearing an activity tracker pre-transplant can decrease the total length of stay in ICU even by one day, it is clinically and financially significant.

Activity trackers can be useful in measuring patient activity when staff is limited. They are non-invasive, they measure a more prolonged view of patient activity rather than a quick snapshot assessment, and although they may vary in degrees of validity across brands and patient health, they may function to promote motivation to ambulate (Macapagal et al., 2021; Singhal & Cowie, 2020; Vetrovsky et al., 2019).

Study Purpose

The purpose of this quantitative phase of the mixed methods study was to compare post-operative recovery time between heart transplant patients who wore an activity tracker pre-operatively to those who did not. This purpose was based on the assumptions that increased pre-operative ambulation is a positive step in the recovery of transplant patients and that an activity tracker should increase patient motivation to ambulate.

Methods

Study Design

This mixed methods study used both qualitative and quantitative methods. The qualitative data was collected on a subsample of eight of the 43 patients wearing the activity tracker using a phenomenological approach. The data was collected simultaneously with the quantitative data. Details of this phase of the study are reported elsewhere (Macapagal et al., 2021). The second phase (quantitative) was a retrospective quasi-experimental study using a review of secondary data from the EMR to compare the post-transplant recovery times of patients who wore an activity tracker preoperatively with those of patients who did not wear an activity tracker preoperatively. Post-transplant "recovery time" was operationalized by seven postoperative variables that were measured in hours or days. These variables included: time from admittance to CVICU to extubation, discharge from CVICU (CVICU length of stay), discharge from hospital (hospital length of stay), sitting on the side of the bed (dangling), standing by the bed, walking to a chair, and walking at least 10 steps.

Sampling

Two groups of patients were involved in the quantitative study. The first group was the experimental group wearing the activity tracker. The second group was selected from patients from the same CICU. The original total sample size was determined based on a power analysis. With an alpha of .05, power of .8, and estimated effect size of .6, using an independent t-test, the calculated sample size was 90, with 45 in each group. Between 2017 and 2018, following the hospital's Institutional Review Board (IRB) approval, 45 preoperative heart transplant patients with a diagnosis of HF were approached to be in the Fitbit group and consented to participate in the quantitative and qualitative studies (Macapagal et al., 2021). Inclusion criteria included: in-patient, pre-heart transplant adult on the 1A UNOS transplant list, ambulatory per doctors' orders, on vasopressors, with a pulmonary artery catheter and/or intra-aortic balloon pump. Two of the 45 patients had to be dropped from the study due to one patient not having a smartphone/ computer required for use of the activity tracker and the other having a transplant before the 2-week minimum wait period (see Figure 1).

To sample the control group, medical records were chosen consecutively and examined for the same inclusion criteria used for the activity tracker group. The first 45 records meeting the criteria were selected for the control group. All patients were from the same CICU.

To eliminate the social interaction threat to validity, the control group was selected from patients who were admitted after all the activity tracker patients had been transferred from the CICU to the OR for heart transplant. To protect their privacy, each subject was assigned a non-meaningful number. The data for the study was transferred from the EMRs to individual paper questionnaires. A master list of the patient's name, medical record number (MRN) and assigned number was retained in a locked compartment available solely to the PI.

In reviewing the questionnaires, one patient had to be dropped from the control group due to having a left ventricular assist device rather than a heart transplant and another was an outlier due to an extended post-transplant hospitalization and death. This patient was omitted from the analysis. The final sample consisted of 43 patients in the control group and 41 patients from the activity tracker group (see Figure 1).

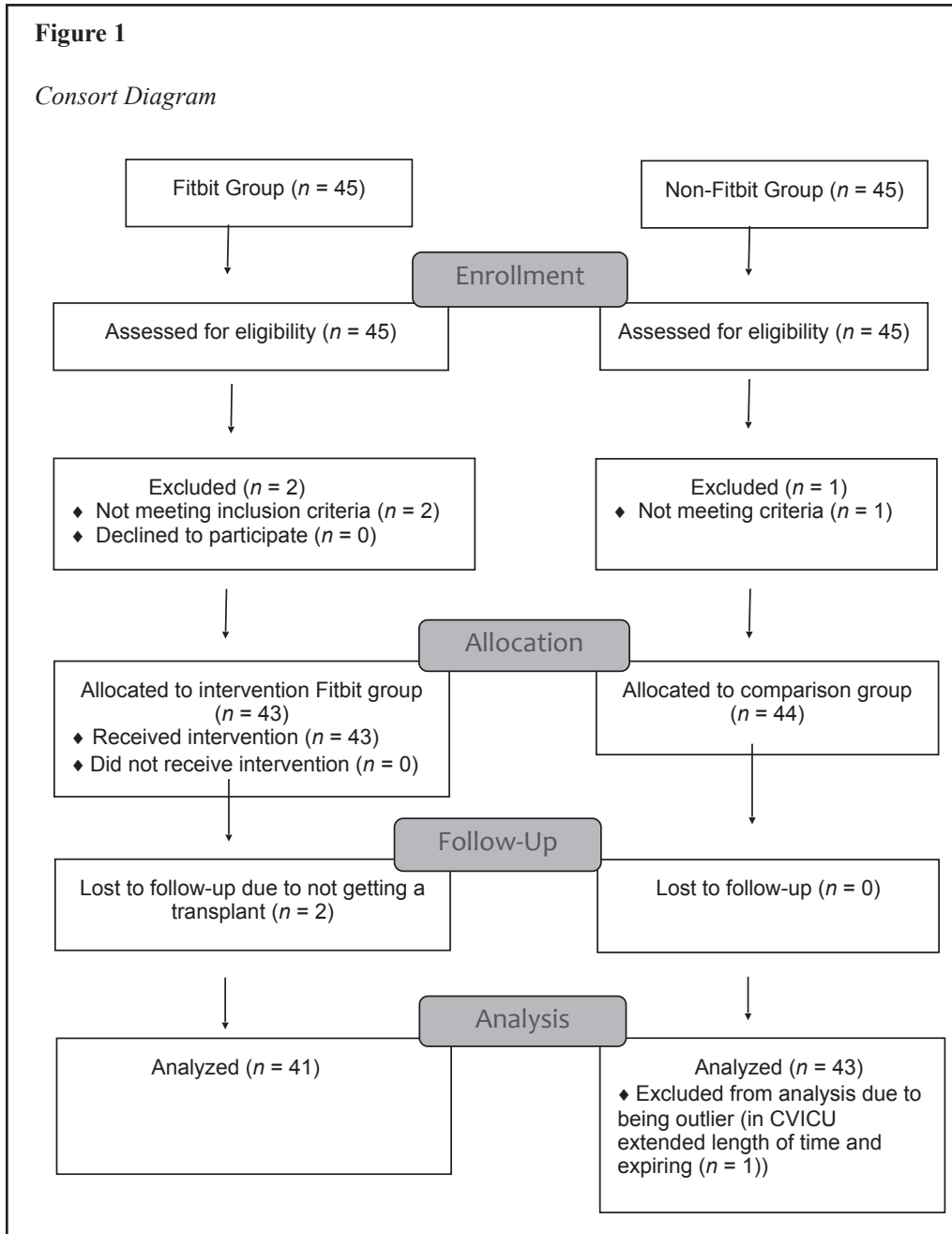#### Data Collection

The Fitbit One was selected as the activity tracker to use in the study due to the hospital using this brand for the health challenge for all employees. Additionally, the PI of the study had personally used this brand of tracker and determined it to be accurate in measuring his steps and it had a long battery life.

Patients in the activity tracker group were given an activity

Figure 1

Consort Diagram

the research team accessed the EMR's of both the activity tracker group (*n* = 43) and the control group (*n* = 44) to gather the data for the outcome variables (time until: extubation, dangling, standing by side of bed, sitting in chair, walking 10 steps, discharge from CVICU, and discharge from hospital). A custom questionnaire with a total of 40 items was developed by the research team to measure each of the 7 variables plus demographic data, body mass index (BMI), transplant wait times, comorbidities, and medications. The location of the data within the EMR's was discussed among the team to enhance data reliability. Interrater reliability was evaluated using the percent agreement (total agreements/total agreements + disagreements) among the four data collectors. The first reliability check, completed on two EMR's, produced a 78% agreement. After modifications in the data gathering technique and questionnaire, a reliability rating of 84% was obtained. Further refinements produced a 91% agreement. Researchers used the revised questionnaire for collecting data on all 84 EMR's from both groups. All data was entered into a researcher-designed spreadsheet and then transferred to Statistical Program for Social Sciences (SPSS, Version 25) for analysis.

tracker that they could keep and instructed to wear it every day during their waking hours throughout their preoperative CICU stay. They were to use the activity tracker to keep track of their own statistics and to add a sense of competition by accessing other de-identified patients' activity tracker statistics in the newly formed pre-heart transplant Fitbit One group. Data were entered into patients' EMRs during their hospital stays in 2017-2018. All CICU nurses and physical therapists were instructed to record accurate and complete data for all outcome variables, all of which were ordinarily included in the EMR.

Later, after all activity tracker patients had been discharged,

Data Analysis
Researchers hypothesized that patients who wore an activity tracker pre-transplant would have a faster post-transplant recovery time when compared to similar patients who did not wear an activity tracker. The independent variable was "activity tracker versus no activity tracker," and the dependent

variable was "recovery time." Each of the seven measurements of recovery time was treated individually.

Descriptive statistics were computed using the Kolmogorov-Smirnov test and a histogram with a superimposed normal curve to test the assumption of normality in the seven outcome variables. All the variables had a positive skew thus the decision was made to use non-parametric statistics. To test the difference between the two groups, investigators used a 2-tailed Mann-Whitney U test with an alpha of .05. The null hypothesis for each test was that there is no difference between the two groups for each dependent variable.

Results

The sample was examined for outliers. One patient in the control group was found to be an outlier on many of the variables. This person was in the CVICU for several months and expired. He was omitted from the analysis as he was atypical of the population, thus bringing the control group sample to 43. Two of the activity tracker group of patients were lost to follow-up, bringing that sample size down to 41.

To determine if there were any confounding variables, differences in demographic characteristics were compared between groups. As shown in Table 1, one demographic characteristic differed between the two patient groups. The number of days in the CICU before transplant was significantly longer (63 vs 36) in the activity tracker group. The average person in this sample was a white male, age 57.5, with a BMI of 26.

Exploration of all dependent variables revealed descriptive statistics of centrality and variances (see Table 2). The variables measured time, so the desired result was that the time for the Fitbit group would be less than the control group. Since the Mann-Whitney U statistic compares the mean rank of the two groups, in Table 2 the mean rank is lower in all dependent variables except "ambulating at least 10 feet".

Three out of seven hypotheses were statistically significant at the .05 alpha level. These hypotheses were in favor of wearing an activity tracker before a heart transplant:

1. Time until sitting on the side of the bed (Mann-Whitney U, $p = .040$).
2. Time until standing by the side of the bed (Mann-Whitney U, $p = .019$).
3. Length of stay in the CVICU (Mann-Whitney U, $p = .008$).

A graphical presentation of the mean rankings for each of the seven dependent variables for each group can be seen in Figure 2.

Discussion

Physical therapy guidelines dictate that treatments begin one day postoperatively. Factors such as critical condition, hemodynamic instability, presence of MCS that limits mobility, and ongoing interventions can cause delays in mobility treatments. Because these delays would be equivalent for both groups, any measurement error would be random, and thus irrelevant in exploring differences between groups.

According to results obtained in this study, the activity tracker patients were sitting on the bed (dangled) earlier in the post-transplant period than the control group (Mann-Whitney U, $p = .040$). The physical therapy treatment team usually performed sitting on the bed (dangling) followed by standing by the side of the bed at the same time, depending on the patient's condition. Sitting in

Table 1

Sample Characteristics

Characteristic	Fitbit (*n* = 41)	Non-Fitbit (*n* = 43)	Difference (*p* < .05)	Difference between groups
Age (mean)	57.51	57.51	*p* > .05	No difference
BMI	27.02 (3.02)	25.56 (4.24)	*p* > .05	No difference
Ethnicity			*p* > .05	No difference
White	19	27		
Black	16	11		
Hispanic	6	4		
Asian	0	1		
Days in CICU before transplant	63 (47.66)	36.49 (31.33)	*p* < .05	Sig. difference
Gender	34 M; 7 F	29 M; 14 F	*p* > .05	No difference

Table 2

Means, Standard Deviations, Medians, and Ranks of Dependent Variables by Fitbit Group

Dependent Variable	Fitbit group (1=fitbit, 2=non-fitbit)	N	Mean	Std. Deviation	Median	Rank	Mann-Whitney U p value
Post-transplant ICU LOS in days*	1	41	7.27	5.00	6	35.22	.008*
	2	43	9.63	6.62	9	49.44	
Post-Transplant Hospital Length of Stay in days	1	41	21.32	7.50	19	39.46	.264
	2	43	24.93	11.78	23	45.40	
Extubation Time in hours	1	40	21.35	25.30	14	40.63	.616
	2	43	30.28	37.53	12	43.28	
Sit on side of the bed (dangle) in hours*	1	40	47.80	32.93	37	35.96	.040*
	2	42	85.79	101.36	39	46.77	
Stand by the side of the bed in hours*	1	40	48.35	32.72	41	35.19	.019*
	2	42	89.19	101.27	40	47.51	
Ambulate to the chair in hours	1	40	63.80	95.93	44	36.44	.085
	2	41	90.93	113.18	43	45.45	
Ambulate at least 10 feet in hours	1	40	123.58	106.62	102	40.20	.479
	2	36	99.17	50.51	98	36.61	

Note: Differences in groups were calculated using Mann-Whitney U test due to violation of normality assumption and uneven groups.
*Significant at $p < .05$

a chair was also often associated with these two initial physical therapy treatments actions. The study found no significant difference in both groups for the latter action.

Differences between groups can possibly be attributed to the patients' pre-transplant physical activity, stamina, and stability due to an increase in mobility, walking, and motivation. Any strategy that helps post-op patients become mobile sooner is beneficial in preventing ICU-acquired weakness and other post-op complications (Li et al., 2020). This study supported the conclusions of Li et al. (2020) in that the activity tracker group showed faster recovery time in sitting and standing by the side of the bed and decreased length of stay in CVICU.

The length of stay in the CVICU can be affected by different factors such as presence of complications, physician preference, and availability of transplant floor beds. All the patients in the study were equally subjected to these factors, thus any differences between groups due to these factors are

Figure 2

Comparison of Mean Ranks of Dependent Variables by Fitbit Group
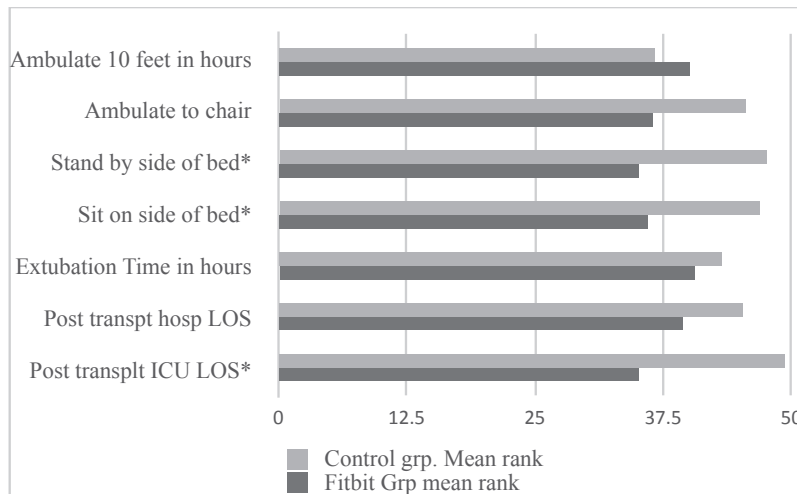
Note: * indicates $p < .05$; LOS measured in days, all other variables measured in hours.

Time until ambulation to the chair and time until ambulation of at least 10 feet is affected by patients' stability (both hemodynamic and balance), and presence of MCS with femoral cannulation, which is typically removed once the patient is stabilized. Balance would be expected to be better in the activity tracker group, but the other parameters would not be affected by pre-transplant activity.

This quantitative study did not examine the variable of "motivation," which is likely a factor in the significant positive outcomes of the Fitbit group in three of the hypotheses. However, in order to tap this motivation factor and other potential factors to better understand the psychological and emotional effects of wearing an activity tracker, a qualitative phenomenological study was completed on a subsample of eight activity tracker patients simultaneously with the quantitative data collection (Macapagal et al. 2021). The results of the phenomenological study suggested that using a Fitbit motivated hospitalized pre- heart transplant patients to increase their activity and ambulation. Patients stated they enjoyed using the tracker (see full article in Macapagal et al., 2021).

random. Early patient mobilization equates to faster post- op recovery and decreased post- op time in the hospital (Li et al., 2020).

While this study demonstrated that the activity tracker group was discharged one day earlier from the CVICU, it did not show that this group was discharged significantly earlier from the hospital ($p = .264$). This result might be explained by a difference in the two groups' home care resources or a lack of bed availability if being discharged to an in-patient rehabilitation facility. Neither of these post-hospital resources were included in the study questionnaire.

The shorter CVICU length of stay translates to a decrease in hospital resource utilization and costs, thereby benefiting both the patient and hospital. With the average heart transplant estimated billing cost being 1.64 million dollars (Li et al., 2020), a savings of even one day in the CVICU could amount to a significant financial benefit.

Not all the postoperative variables used to assess recovery time were significantly different between the groups. Respiratory therapists extubate all the post-op heart transplant patients as soon as they are awake from anesthetic and sedation, pass the spontaneous breathing trial and meet extubation parameters. While not expected, the two groups may have differed on any of these variables which were not measured in this study. These might explain the non-significance of this variable.

Limitations
The use of a retrospective EMR review to gather data is not as robust as a prospective design on current live patients. The data is limited by what was recorded by nurses and physical therapists during their hospitalization. Data may have been missing or incomplete in the EMR. The researchers assumed the EMR data was accurate and thorough. However, the possibility exists that some of the CVICU physical therapy and nursing staff knew about the study and which patients used the activity tracker. They may have unconsciously pushed them more toward early sitting and standing.

Another limitation in the CICU is that the activity tracker had to be worn in different places on different patients due to different equipment, tubes, and force of steps. Some activity trackers were worn on the gown, and some were clipped inside the patient's socks. The nurses who were assisting with ambulation of these patients monitored the activity tracker

as the patients took steps to ensure the device was registering each step. At times, the nurses had to manually reposition the activity tracker for better tracking. Thus, while the researchers felt confident that steps were accurately recorded, there is no way of knowing for certain.

In a study by Fehan et al. (2018), the accelerometer like the Fitbit, was less accurate in recording the movement at slow ambulation speeds which is relevant for HF patients. Furthermore, activity monitors consistently undercounted steps at low speeds, according to Tedesco et al. (2019). Finally, the sample size was small, thus limiting the statistical power and increasing the chances of a type two error. Future research using a larger sample is recommended.

Conclusions

The results of this study suggest the use of an activity tracker for measuring and motivating activity and ambulation in pre-heart transplant patients may have post-operative benefits. Compared to the other group, activity tracker patients had significant post-operative differences in the time till sitting up in bed, standing, and decreased ICU length of stay. Larger studies are needed to examine the benefits of activity trackers for ICU pre-heart transplant populations and in other types of patients.

Post-operative use of the activity tracker, and a one-year follow-up study on survival, mobility, and other indicators of health would be beneficial. Since there is such a difference in the survival time between frail and non-frail HF patients (52% vs 100%; Kobashigawa et al., 2019), a study of activity tracker use in frail patients would be interesting.

References

American Heart Association (2021, Jan. 27). Heart disease and stroke statistics—2021 update: A report from the American Heart Association. *Circulation, 143*(8), Article e254-3743. https://doi.org/10.116/CIR.0000000000000950

Bentley, S., & Ortner, N. J. (2020). Milliman research report: 2020 U.S. organ and tissue transplant cost estimates and discussion. *Milliman Research Report,* 2-22. https://millimancdn.azureedge.net/media/milliman/pdfs/articles/2020-us-organ-tissue-transplants.ashx

Blondeel, A., Demeyer, H., Janssens, W. & Troosters, T. (2020, Aug. 4). Accuracy of consumer-based activity trackers as measuring tool and coaching device in patients with COPD and healthy controls. *PLoS ONE 15*(8): e0236676. https://doi.org/-10.1371/journal.pone.0236676

Degroote, L., De Bourdeaudhuij, I., Verloigne, M., Poppe, L., & Crombez, G. (2018, Dec. 13). The accuracy of smart devices for measuring physical activity in daily life: Validation study. *JMIR Mhealth Uhealth, 6*(12), Article e10972. https://doi.org/10.2196/10972

Fehan, L. M., Geldman, J., Sayre, E. C., Park, C., Ezzat, A. M., Yoo, J. Y., Hamilton, C. B., Li, L. C. (2018, Aug 9). Accuracy of Fitbit devices: Systematic review and narrative syntheses of quantitative data. *JMIR Mhealth Uhealth, 6*(8), Article e10527. https://doi.org/10.2196/10527. PMID: 30093371; PMCID: PMC6107736.

Fitbit™ One wireless activity and sleep tracker user manual. http://www.Fitbit™.com/devices.

Gershenghorn, H.B., Garland, A., & Gong, M.N. (2015, December). Patterns of daily costs differ for medical and surgical intensive care unit patients. *Annals ATS, 12*(12), 1831-1832. https://doi.org/10.1513/AnnalsATS.201506-366BC

Heo, S., McSweeney, J., Tsai, P.A. & Ounpraseuth, S. (2016, November). Differing effects of fatigue and depression on hospitalizations in men and women with heart failure. *AJCC, 25*(6), 526-534. https://doi.org/10.4037/ajcc2016909

Kapoor, J. R. & Ju, C. (2016). Precipitating clinical factors, heart failure characterization, and outcomes in patients hospitalized with heart failure with reduced, borderline, and preserved ejection fraction. *JACC: Heart Failure, 4*(6), 465-470. https://doi.org/10.1016/j.jchf.2016.02.017

Kobashigawa, J., Dadhania, D., Bhorade, S., Adey, D., Berger, J., Bhat, G., Budev, M., Duarte Rojo, A., Dunn, M., Hall, S., Harhay, M. N., Johansen, K. L., Joseph, S., Kennedy, C. C., Kransdorf, E., Lentine, K. L., Lynch, R. J., McAdams-DeMarco, M. ... Lai, J. C. (2019). Report from the American Society of Transplantation on frailty in solid organ transplantation. *AMJ Transplant, 19*, 984–994. https://doi.org/10.1111/ajt.15198

Kuno, T., Takagi, H., Ando, T., Kodaira, M., Numasawa, Y., Fox, J., & Bangalore, S. (2021). Safety and efficacy of mechanical circulatory support with impella or intra-aortic balloon pump for high-risk percutaneous coronary intervention and/or cardiogenic shock: Insights from a network meta-analysis of randomized trials. *Catheterization and Cardiovascular Interventions, 97*(5), Article E636-646. https://doi.org/10.1002/ccd.29236

Li, Z., Zhang, Q., Zhang, P., Sun, R., Jiang, H., Wan, J., Wu, F., Wang, X., & Tao, X. (2020). Prevalence and risk factors for intensive care unit acquired weakness: A protocol for a systematic review and meta-analysis. *Medicine, 99*(36), Article e22013. https://doi.org/10.1097/MD.0000000000022013

Liu, J., Yang, B. Q., Itoh, A., Masood, M. F., Hartupe, J.

C., & Schilling, J. D. (2020, Dec. 15). Impact of new UNOS allocation criteria on heart transplant practices and outcomes.*Transplantation Direct, 7*(1): Article e642. https://doi.org/10.1097/TXD.0000000000001088. PMID: 33335981; PMCID: PMC7738116.

Lohmueller, L. C., Movahedi, F.A ., & Antaki, J. F. (2017). Living the dream: Event free survival in patients receiving a Cf-LVAD. *Journal of Cardiac Failure, 23*(8), Supplement: S118-S118. https://doi.org/10.1016/j.cardfail.2017.07.347

Loprinzi, P., D., Edwards, M. K., Sng, E., & Addoh, O. (2016, Oct. 1). Sedentary behavior and residual-specific mortality. *Health Promotion Perspectives, 6*(4),196-201. https://doi.org/10.15171/hpp.2016.32 PMID: 27766237; PMCID: PMC5071787.

Macapagal, F. R., Bonuel, R., Rodriguez, H., & McClellan, E. (2021). Experiences of pre–heart transplant patients using a fitness tracker as an ambulation-measuring device. *Critical Care Nurse, 41*(4), e24-e27.

Macapagal, F. R., McClellan, E., Macapagal, R. O., & Green, L. (2019). Nursing care and treatment of ambulatory patients with percutaneously placed intra-aortic balloon pump before heart transplant. *Critical Care Nurse, 39*(2), 45-52. https://doi.org/10.4037/ccn2019729

Moayedi, Y., Abdulmajeed, R., Duero Posada, J., Foroutan, F., Alba, A. C., Cafazzo, J., & Ross, H. J. (2017). Assessing the use of wrist-worn devices in patients with heart failure: Feasibility study. *JMIR Cardio,1*(2):e8.

Patnaik, S., Nathan, S., Bui, A., Kar, B., Gregoric, I. D., & Gilley, C., (2019). Does physical therapy matter among heart transplant recipients while on intra-aortic balloon pumps in the pretransplant period? *Journal of Cardiac Failure, 25*(8), S149.

Singhal, A., & Cowie, M. R., (2020, Aug.). The role of wearables in heart failure. *Current Heart Failure Reports, 17*(4),125-132. https://doi.org/10.1007/s11897-020-00467-x. PMID: 32494944; PMCID: PMC7343723.

Tan, M. K. H., Wong, J. K. L., Bakrania, K., Abdullahi, Y., Harling, L., Casula, R., Rowlands, A. V., Athanasiou, T., & Jarral, O. A. (2019). Can activity monitors predict outcomes in patients with heart failure? *A systematic review. European Heart Journal - Quality of Care and Clinical Outcomes, 5*(1),11-21. https://doi.org/10.1093/ehjqcco/qcy038. PMID: 30215706.

Tedesco, S., Sica, M., Ancillao, A., Timmons, S., Barton, J., & O'Flynn, B. (2019, May 21). Accuracy of consumer-level and research-grade activity trackers in ambulatory settings in older adults. *PLoS One, 14*(5):e0216891. https://doi.org/10.1371/-journal.pone.0216891. PMID: 31112585; PMCID:PMC6529154.

Thorup, C., Hansen, J., Grønkjær, M., Andreasen, J. J.,

Nielsen, G., Sørensen, E. E., & Dinesen, B. I. (2016). Cardiac patients' walking activity determined by a step counter in cardiac telerehabilitation: Data from the intervention arm of a randomized controlled trial. *Journal of Medical Internet Research, 18*(4), e5191. https://doi.org/10.2196/jmir.5191

Vetrovsky, T., Siranec, M., Marencakova, J., Tufano, J. J., Capek, V., Bunc, V., & Belohlavek, J. (2019). Validity of six consumer-level activity monitors for measuring steps in patients with chronic heart failure. *PLoS ONE, 14*(9):e0222569.

Yancy, W., Jessup, M., Bozkurt, B., Butler, J., Casey, D. E., Calvin, M. M., Drazner, M. H., Filippatos, G. S., Fonarow, G. C., Givertz, M. M., Hollenberg, S. M., Lindenfeld, J., Masoudi, G. A., McBride, P. E., Peterson, P. N., Stevenson, L. W., & Westlake, C. (2017). *ACC/AHA/HFSA Focused update of the 2013 ACCF/AHA guidelines for the management of heart failure clinical practice guideline: Focused update, 23*(8), 628-651. https://doi.org/10.1161/CIR.0000000000000509

JOURNAL OF NURSING PRACTICE APPLICATIONS & REVIEWS OF RESEARCH

Improving the Quality of Oral Health Screening for Young Children in Primary Care

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Abstract

Introduction: Early childhood caries (ECC) is the most common chronic disease to occur in childhood and is often neglected in primary care. Despite the American Academy of Pediatrics' recommendation to conduct oral health risk assessments (OHRs), fluoride varnish (FV) applications, oral health anticipatory guidance, and dental referrals during well-visits for children six months old to five years old, primary care providers do not consistently implement these practices.

Objective: The purpose of this quality improvement project was to increase utilization of these evidence-based guidelines at a federally qualified health center in Southern New Jersey.

Methods: The project methods involved implementing a routine screening protocol and clinical reminder system to increase OHRAs, anticipatory guidance, FV applications, and dental referrals for children six months old to five years old during well-visits. Three nurse practitioners and one physician were educated about a routine pediatric oral health screening protocol and clinical reminder system that was then utilized over a three-month period. The protocol involved use of a standardized questionnaire and screening tool, electronic clinical reminders, and written patient education during all well-visits for children six months old to five years old. Retrospective chart reviews were used to evaluate for practice improvement, before and after implementation of the project.

Results: After a three-month period, 129 randomly selected medical records for well-visits in this age group revealed 94.6% improvement in oral health risk assessments, 14.7% increase in children identified as high caries-risk, 30.2% increase in oral health anticipatory guidance, and 100% improvement in dental referrals.

Conclusions: This project's significant clinical findings suggest that a standardized protocol can improve implementation of pediatric oral health screening guidelines in primary care. Evidence shows these practices will likely lead to decreased incidence of ECC and improved overall health throughout the lifespan.

Keywords: early childhood caries, dental caries, pediatric oral health screening, fluoride varnish, primary care, quality improvement projects

Background

Despite being highly preventable, early childhood caries (ECC) is currently the most common chronic disease to occur in childhood and is even five times more common than asthma (Moyer, 2014). ECC, or cavities in children under six years old, develop when excess dietary sugars mix with bacteria that is present on teeth (American Academy of Pediatric Dentistry [AAPD], 2014). This process leads to erosion of the tooth enamel, cavity formation, and many other physical, emotional, and social consequences (AAPD, 2014).

Because primary care providers have frequent contact with children during well-visits, they have the ideal opportunity to identify children at high-risk for ECC and recommend appropriate preventative measures. The American Academy of Pediatrics (AAP; 2014) recommends that primary care providers conduct oral health risk assessments (OHRA), fluoride varnish (FV) applications, oral health anticipatory guidance, and dental referrals for all children six months old to five years old during well-visits. Despite these evidence-based guidelines, many primary care providers fail to implement these practices on a routine basis (Harnagea et al., 2017). Primary care physicians and nurse practitioners need education on how to best incorporate oral health screening into standard well-child visits, in order to prevent ECC and promote overall health. This project sought to improve the quality of pediatric oral health screening in primary care by implementing a routine screening protocol, clinical reminders, and staff education.

Healthcare Significance

ECC have significant consequences for children, families, and health care organizations. Children with ECC can suffer from dental abscesses, systemic infections, premature loss of primary teeth, and difficulties learning to speak and eat (Hagan et al., 2017). These children are also at increased risk for future caries in primary and secondary teeth (Hagan et al., 2017). In addition to physical consequences, ECC can negatively impact the emotional and social well-being of children. Chou et al. (2014) found that young children with dental caries had lower self-esteem than children with healthy teeth, due to having an altered physical appearance. These children can also suffer from poor academic performance and increased school absences from having to seek dental care (Moyer, 2014). It has been estimated that more than fifty million hours of school are missed per year by children who have dental problems (Griffin et al., 2014). Families of children with ECC can suffer from increased work absences, excess medical bills, and financial burden associated with their child's dental treatments (Moyer, 2014). Health care providers and institutions are also impacted by increased costs of care, emergency room visits, and hospital stays from dental disease complications (Stephens et al., 2018). According to Clark et al. (2016), treat-

ment of existing caries is associated with costs ten times that of preventative measures.

There are also significant social and racial disparities associated with ECC. Children who have special medical needs and those from lower income households have significantly higher risk of developing dental caries (Dye et al., 2015). African American and Hispanic children have almost double the incidence of untreated ECC, when compared to white children, regardless of medical co-morbidities and household income (Dye et al., 2015).

Many of the leading health care organizations in the United States have set goals for pediatric oral health that have yet to be accomplished. In 2000, the Surgeon General released the Oral Health in America report that emphasized the need for improving awareness and interventions in health care that promote oral health. In 2010, the Centers for Disease Control and Prevention (CDC) reported the national goal of decreasing the proportion of children with ECC by the year 2020. Despite these goals, prevalence of ECC in children three to five years old increased by almost 2% from 2011 to 2014 (ODPHP, 2019).

Literature Review

Current evidence supports the use of pediatric oral health screening in primary care for reducing incidence of ECC. An ecologic study published by Achembong et al. (2014) examined trends in ECC in different counties in North Carolina after the Into the Mouths of Babes (IMB) program was initiated in 2000. This Medicaid-based program involves implementing routine OHRA assessments, oral health anticipatory guidance, FV applications, and dental referrals during well-visits for children up to 42 months old (Achembong et al., 2014). The researchers found that counties in North Carolina with greater usage of these services had significantly lower rates of dental caries in kindergarten-aged children in subsequent years (Achembong et al., 2014). Additionally, they determined that North Carolina overall had a significant reduction in ECC incidence since the IMB program was introduced in 2000 (Achembong et al., 2014).

The AAP, AAPD, and United States Preventative Services Task Force (USPSTF) agree that OHRA is crucial for identifying factors that lead to ECC (AAP, 2014; AAPD, 2014; Chou et al., 2014). The AAP produced a clinical guideline in 2014 that summarizes specific strategies for promoting pediatric oral health in the primary care setting. These strategies consist of routine OHRAs, oral health anticipatory guidance, FV applications, and dental referrals during all well-visits for children six months old to five years old (AAP, 2014). The AAP (2014) also created an OHRA Tool that can be used to implement these strategies in the primary care setting. Although psychometric properties have

yet to be determined, studies found that using the AAP's OHRA Tool, or a modified version of the tool, was associated with increased rates of screening, FV applications, and dental referrals during well-visits (Okah et al., 2018; Sengupta et al., 2017).

Research shows that there is a need for improvement in how pediatric oral health screening guidelines are implemented in primary care. A study was conducted in 2014 to improve identification of children at high-caries risk by implementing a routine oral health screening tool during well-visits (Jackson, 2014). After a three-month period, the researchers found that only 58% of the providers were utilizing the screening tool on a regular basis (Jackson, 2014). Similarly, Harnagea et al. (2017) found that primary care practitioners were not issuing dental referrals for almost 50% of children who were eligible according to AAP guidelines. These findings indicate that providers need to be educated in depth about the benefits of oral health screening and specific strategies to make the process efficient and sustainable.

Project Purpose

The purpose of this quality improvement project was to improve the quality of pediatric oral health screening in primary care by addressing common barriers to sustainability. The goal was to educate all health care providers and medical assistants at a primary care clinic about a routine oral health screening protocol and clinical reminder system to be used during well-visits for children six months old to five years old. These interventions were intended to increase OHRAs, oral health anticipatory guidance, FV applications, and dental referrals during well-visits for children in this age group. It was expected that the project findings would inspire other primary care practices to implement routine protocols and reminder systems to improve the quality of their own pediatric oral health screening practices.

Clinical Question

Will the implementation of a routine oral health screening protocol, clinical reminder system, and provider education improve OHRAs, anticipatory guidance, FV applications, and dental referrals for children six months old to five years old in primary care?

Methods

The project methods involved implementing a routine screening protocol and clinical reminder system to increase OHRAs, anticipatory guidance, FV applications, and dental referrals for children six months old to five years old during well-visits. While developing the project methods, the organization's leaders and staff determined they lacked the resources to begin offering FV applications during well-visits. Instead, they opted to refer patients to a dentist within their healthcare network to receive this service. The organization decided to evaluate for improvement in identification of children at high-caries risk.

The project began with a retrospective chart review to establish baseline rates of OHRAs, children identified as high-caries risk, oral health anticipatory guidance, and dental referrals during well-visits for children six months old to five years old. Next, a pre-recorded educational video was recorded to train the medical assistants, nurse practitioners, and physician on a routine oral health screening protocol and clinical reminder system. The medical team members then implemented the protocol during eligible well-visits during the subsequent three-month period. The project concluded with another retrospective chart review, which revealed clinically significant improvement in OHRAs, identification of children at high-caries risk, oral health anticipatory guidance, and dental referrals during eligible well-visits.

These methods were developed using a logic model and Lewin's Change Theory. The logic model was used to conceptualize the project's processes and outcomes, including the staff education session, oral health screening protocol, and system for monitoring progress (CDC, 2018). Lewin's Change Theory (1947) was then used to assess for driving forces that would promote sustainable changes within the organization, which included establishing an oral health champion at the project site. Lewin's (1947) theory was also considered when assessing for negative forces that could hinder the project's sustainability, including any steps of the screening protocol that were time-consuming or redundant.

Setting

This quality improvement initiative took place at a federally qualified health center (FQHC) in Southern New Jersey. This office, which is part of a larger healthcare network, offers primary care services to children and adults from various racial, ethnic, and social backgrounds. Payment options include an income-based sliding scale, Medicaid, Medicare, TRICARE, and private insurance plans. The office's main clinical team is comprised of three nurse practitioners, one physician, and three medical assistants. While this primary care practice does not currently offer dental services, they have an affiliated office in a nearby town that offers dental care for children and adults.

Project Implementation

The oral health screening protocol was constructed based on the AAP's (2014) most recent guideline, "Maintaining and Improving the Oral Health of Young Children." A flowchart of protocol can be found in Figure 1.

A modified version of the AAP's (2014) OHRA Tool was also created to make the process efficient and sustainable for the organization (See Figure 2). The first section of the Oral Health Intake Questionnaire and Screening Tool, which contains screening questions for the parent's caregiv-

Figure 1

Pediatric Oral Health Screening Protocol

MA= medical assistant HCP= healthcare provider (physician or nurse practitioner)
FV= fluoride varnish EMR= electronic medical record
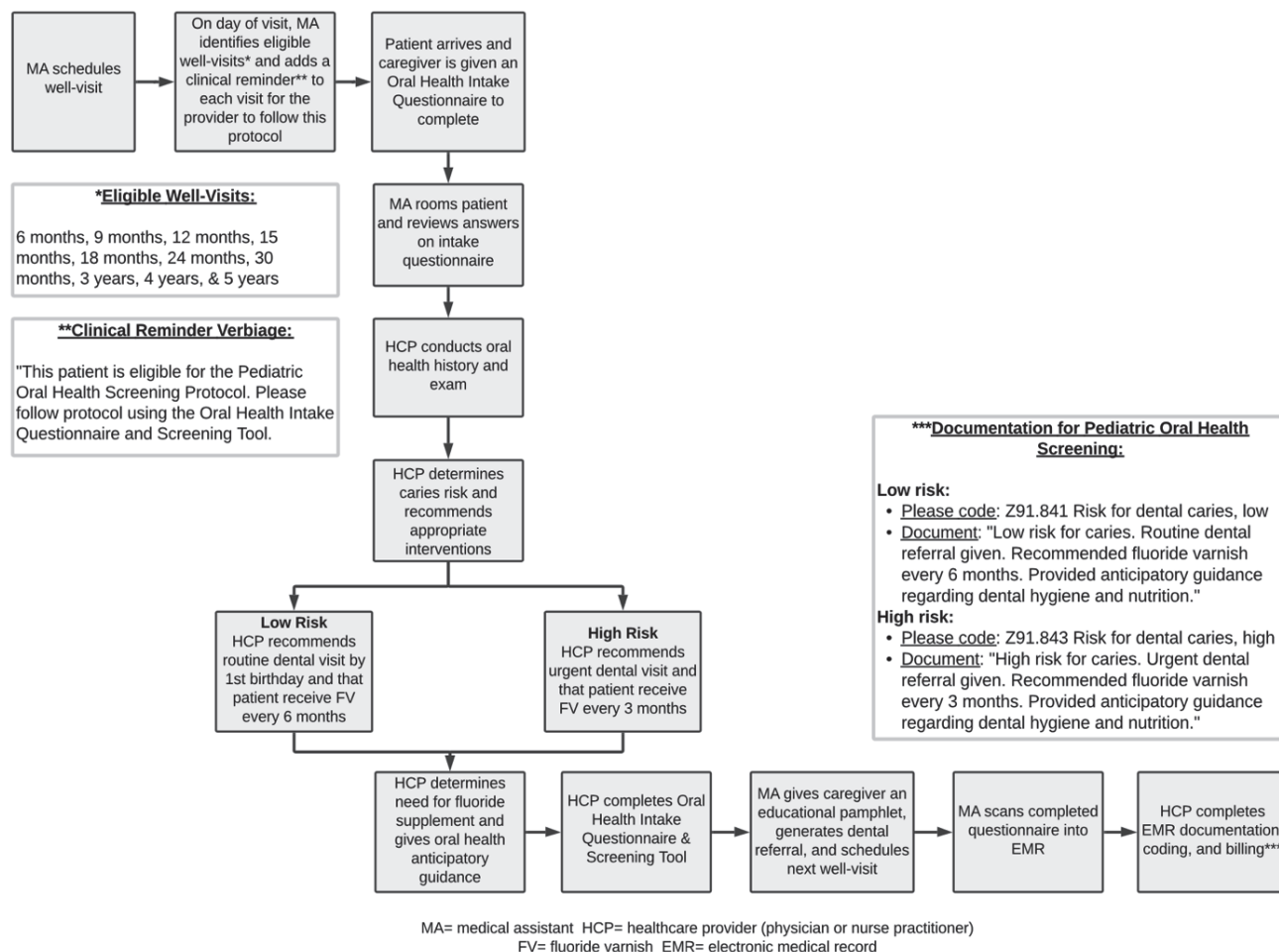
er, was developed based on Dr. Margherita Fontana's Oral Health Intake Questionnaire (Dickson & Fontana, 2018). The second section of the tool was created for the provider to document the child's oral exam findings, caries risk assessment, and oral health plan.

The pediatric oral health screening protocol began on the day of the office visit, with the MA adding a clinical reminder to all patient charts that were eligible for oral health screening. When the patient arrived, the caregiver was asked to complete the screening questions on the Oral Health Intake Questionnaire and Screening Tool. Then, the provider performed the well-visit and documented the oral exam findings, caries risk assessment, and oral health plan on the screening tool. The oral health plan for children at low-caries risk included seeing a dentist by the first birthday, receiving FV every six months with their dentist, anticipatory guidance about dental hygiene and nutrition, and a prescription for a multivitamin with fluoride, if the child was not regularly drinking fluoridated water. The plan for children at high-risk included seeing a dentist on a more

urgent basis, receiving FV every three months with their dentist, as well as the same anticipatory guidance and multivitamin with fluoride. The protocol concluded by the MA giving the caregiver discharge paperwork, including an educational handout on pediatric oral health, and then scanning the completed Oral Health Intake Questionnaire and Screening Tool into the EMR.

An ID badge card was created to remind providers to follow the pediatric oral health screening protocol and to include specific documentation in the EMR. The reminder card included the ICD-10 codes for low and high caries risk and appropriate documentation of the child's OHRA and oral health plan. These cards were laminated and attached to the providers' ID badges, so they could be easily referenced during office visits.

Finally, an educational video was recorded to train the providers and medical assistants about the basics of ECC and the screening protocol that would be implemented in the office. Due to COVID-19 precautions, the providers and

Figure 2

Oral Health Intake Questionnaire & Screening Tool

Patient Name:_____ Date of Birth:_____ Date:_____

Visit: ☐ 6 month ☐ 9 month ☐ 12 month ☐ 15 month ☐ 18 month ☐ 24 month
☐ 30 month ☐ 3 year ☐ 4 year ☐ 5 year

Oral Health Intake Questionnaire: To be completed by patient's caregiver

ABOUT YOU AND YOUR CHILD

Does your child currently have teeth? ☐ Yes ☐ No
Does your child have a routine dental provider? ☐ Yes ☐ No*
Do you have a routine dental provider? ☐ Yes ☐ No*
Has the child's parent or guardian had any cavities, fillings, or teeth pulled in the past year? ☐ Yes** ☐ No

VISITING THE DENTIST

Has your child ever visited a dentist for pain or cavities? ☐ Yes* ☐ No
Has your child had any cavities, filling, or teeth pulled during the past year? ☐ Yes* ☐ No
Have you seen any changes (white/brown spots or holes) on your child's teeth in the past year? ☐ Yes* ☐ No

ORAL HEALTH CARE HABITS

Does your child brush teeth twice daily with a fluoride toothpaste? ☐ Yes ☐ No*
Has your child had fluoride varnish applied within the last 6 months? ☐ Yes ☐ No*

HEALTHY DIET

Does your child drink juice or sugary drinks or eat sugary snacks between meals? ☐ Yes* ☐ No
Does your child sleep with a bottle or sippy cup at night with juice, soda, milk, formula, or breast milk?
☐ Yes* ☐ No

Adapted with permission from Margherita Fontana, DDS, PHD

Oral Health Evaluation & Plan: To be completed by provider

Is there visible plaque on the teeth? ☐ Yes* ☐ No

Are there signs of decay or white spot lesions on the teeth? ☐ Yes** ☐ No

Does the child have other oral conditions of concern? ☐ Yes* ☐ No

Caries risk assessment: ☐ Low ☐ High

High-risk determination: 1 or more absolute risk factors (**) or 2 or more relative risk factors (*)

Oral Health Plan: ☐ Oral health anticipatory guidance ☐ Fluoride varnish recommended

☐ Fluoride supplement perscribed ☐ Routine dental referral ☐ Urgent dental referral

Provider Name:_____ Provider Signature:_____ Date:_____

Outcome Measures

This project involved assessing for improvement in OHRAs, identification of children at high-caries risk, oral health anticipatory guidance, and dental referrals during well-visits for children six months old to five years old. The outcome measures were assessed through retrospective chart review, prior to project implementation and three months after.

Patient charts were randomly selected for review using the following inclusion criteria: the visit date being during previous three-month period, the ICD-10 code Z00.129, and the patient's age being 6 months, 9 months, 12 months, 15 months, 18 months, 24 months, 30 months, 3 years, 4 years, or 5 years (AAP, 2020b). The outcome measures were evaluated based on the provider's documentation in the EMR.

Analysis

This project was evaluated for quality improvement using Microsoft Excel for Mac Version 16.46 and SPSS Statistics Version 27. Tables with frequency distributions were used to show characteristics of the medical records that were reviewed prior to the staff education and then three months after implementing the screening protocol

medical assistants were given two weeks to view the video remotely. They were also instructed to complete module six of the national oral health curriculum, Smiles for Life, which reviews the etiology of ECC and preventative measures that can be performed in primary care (Clark et al., 2010).

and clinical reminder system. These factors included the well-visit ages, the health care provider who conducted the visit, and documentation of OHRAs, high-caries risk, oral health anticipatory guidance, and dental referrals. Coding was used, so that no personal health information was revealed. Then, rates of the outcome measures were calculated for the pre-implementation and post-implementation

retrospective chart reviews. These rates were displayed as percentages in a clustered bar chart to demonstrate clinical improvement in the outcome measures after implementing the provider education, routine screening protocol, and reminder system.

Results

This quality improvement project took place from January of 2020 to May of 2021. Through this project implementation, 100% of the health care providers and medical assistants at the FQHC were educated about a routine pediatric oral health screening protocol and clinical reminder system. Several modifications to the workflow and provider documentation were made throughout project implementation to make the process efficient and sustainable for the organization. After three months of utilizing the protocol and reminder system, clinically significant improvements were seen in OHRAs, identification of children at high-caries risk, oral health anticipatory guidance, and dental referrals. After the initial chart review, modifications were made to streamline provider clinical decision making and documentation for this project. The oral health champion at the project site created a standard order set based on the key components of the oral health screening protocol. This documentation template was meant to be used during six-month to five-year well-visits to record the patient's OHRA, oral health anticipatory guidance, referrals to the affiliated dentist, and to order a multivitamin with fluoride, if needed. The order set also allowed the provider to generate a clinical reminder to conduct another OHRA at the patient's next well-visit. Key oral health anticipatory guidance and contact information for the local dentist were made to populate on each patient's discharge paperwork.

After three months of implementing the provider education, screening protocol, and clinical reminder system, the final chart review revealed clinically significant improvements in OHRAs, identification of children at high-caries risk, oral health anticipatory guidance, and dental referrals from the start of the project (See Figure 3).

Documentation of OHRAs increased from 0 to 94.6% (n = 122) and children identified as high-risk for caries increased from 0 to 14.7% (n = 19). Oral health anticipatory guidance increased from 69.8% (n = 90) to 100% (n = 129). Lastly, dental referrals increased from 0 to 100% (n = 129) by the conclusion of the project. It was also determined that 100% of children assessed as high-risk for caries received oral health anticipatory guidance and referrals to the affiliated dentist for FV.

Oral Health Risk Assessment and High-Caries Risk

Because caries risk assessments were not a routine component of pediatric well-visits prior to this project, the initial data collection yielded zero medical records with documen-

tation of OHRAs being completed. After three months of implementing this protocol and reminder system, the final retrospective chart review revealed 94.6% (n = 122) with documentation of OHRA being completed. This near 95% increase in OHRAs shows that educating providers about a routine pediatric oral health screening protocol and reminder system is associated with a clinically significant improvement in this outcome measure. Identification of children at high-caries risk also increased from 0 to 14.7% (n = 19) after three months of conducting routine OHRAs as part of this quality improvement project. Continued monitoring of this outcome measure will be crucial, since children at increased risk for caries have the greatest potential benefits from oral health anticipatory guidance, FV applications, and establishing a dental home (AAP, 2014).

Oral Health Anticipatory Guidance

Prior to this project, oral health anticipatory guidance was being offered to patients on an inconsistent basis. The initial chart review yielded 69.8% (n = 90) with documentation of one or more key components of oral health anticipatory guidance per the AAP (2011) tool. After three months of implementing the routine oral health screening protocol, which included consistent caregiver education and provider documentation, 100% (n = 129) of the random sample of patient charts indicated that anticipatory guidance was given regarding dental hygiene and nutrition.
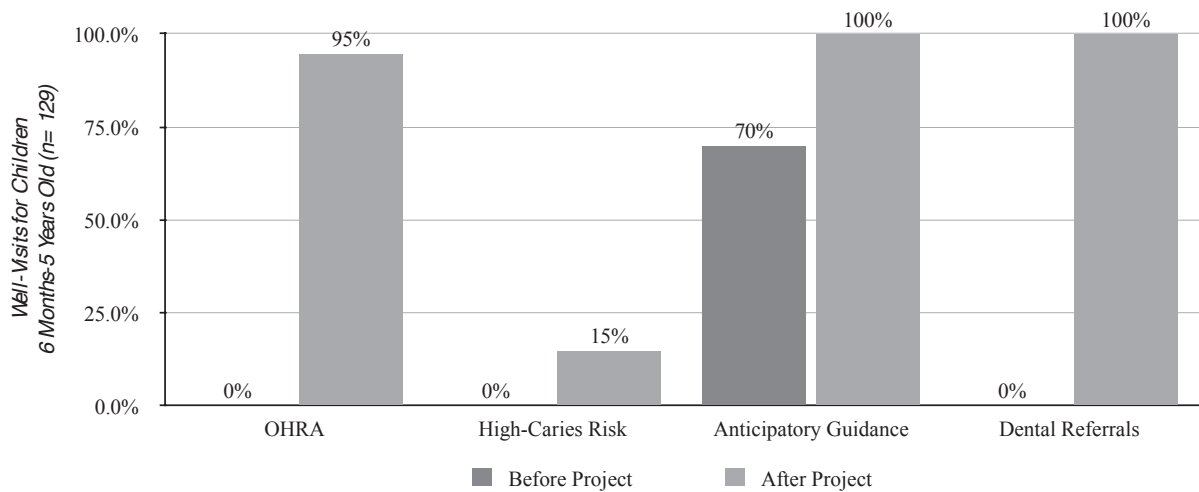
Dental Referrals

The quality of dental referrals was also greatly improved through this pediatric oral health screening protocol. Prior to this project, the providers at this FQHC were inconsistently referring patients to the dental office within their organization for dental care. Because this was not a typical external referral, it was not being captured in the EMR. After three months of implementing this project, which included consistent referrals and documentation, this outcome measure increased from 0 to 100% (n = 129).

Discussion

The results of this quality improvement project indicate that educating providers about a routine protocol and reminder system can increase implementation of evidence-based pediatric oral health screening guidelines in primary care. This project also confirmed several barriers to implementing and sustaining these processes in everyday practice. These difficulties, which were also reported in previous studies, include having inadequate time and resources in primary care offices. Despite facing several barriers while implementing this project, modifications were made to make the process feasible for the organization. After adjusting the project methods, clinically significant improvements were seen in pediatric oral health screening practices at the project site.

Implementation of this quality improvement project con-

Figure 3

Outcome Measures Before and After Project Implementation

Outcome Measures	Before Project		After Project		Change
OHRA	0%	(*n*=0)	94.6%	(*n*=122)	94.6%
High-Caries Risk	0%	(*n*=0)	14.7%	(*n*=19)	14.7%
Anticipatory Guidance	69.8%	(*n*=90)	100%	(*n*=129)	30.2%
Dental Referrals	0%	(*n*=0)	100%	(*n*=129)	100.0%

firmed that inadequate time is a significant barrier to incorporating oral health screening into routine primary care well-visits. The medical assistants at the champion site reported that it would be difficult to find the time to manually input a clinical reminder into each patient's chart that was eligible for oral health screening. This issue was addressed by adding a standard order set that providers could use to implement the pediatric oral health screening protocol and generate a clinical reminder for the subsequent visit. Moving forward, this order set will likely take the place of manually inputting reminders into each chart prior to the visit.

This project also confirmed that many primary care offices do not have the resources to offer additional services, such as FV. This barrier was also reported frequently in previous studies, such as those by Harnagea (2018) and Nelson (2018). The champion site for this project initially agreed that offering FV during well-visits would be useful, but ultimately decided they lacked the finances to initiate FV applications at that time. Because they had a dental provider within their organization, they decided that referring patients to the dentist for FV applications was acceptable for the time being. Although this barrier was not overcome during this project, the clinical site indicated that they will likely begin offering FV during pediatric well-visits in the near future.

Although statistical significance was not determined, the clinical significance is substantial. The oral health champion, who was also one of the primary nurse practitioners seeing pediatric patients in the office, described the positive changes that were accomplished through this project. This individual reported that although manually inputting reminders into each patient's chart was not feasible for the MAs, the protocol was easy to adjust to meet the needs of the office. The site champion reported that adding the pediatric oral health order set to the EMR helped to increase consistency of care and documentation among the providers in the office. The ability to add a clinical reminder to conduct oral health screening at subsequent well-visits through the order set will also likely increase implementation of the protocol over time. The providers also reported that the oral health posters in the treatment rooms served as a useful reminder to follow the protocol and helped to prompt conversations about oral health among the patients' families and the providers.

Implementation of this project also helped to confirm the significant need to improve awareness of pediatric oral health in primary care offices. The providers reported that many caregivers were unaware of basic dental hygiene for young children, such as needing to brush teeth twice daily starting with the eruption of the first tooth and needing to see a dentist by the first birthday. The site champion stated, "This is a culture change that needs to happen in primary care, especially where dental access is limited." He also said that despite being unable to begin in-office FV applications during this project, ordering of multivitamins with fluoride was greatly improved through this project and that "the next step will be to bring FV into the [primary care] clinic setting."

Limitations

While this project showed useful strategies for improving the quality of pediatric oral health screening in primary care, the size and scope of the study had several limitations. Because the study was limited to a three-month period and one office, the findings may not be reproducible on a larger scale. However, the clinically significant findings will likely be transferrable to other primary care settings. The providers' adherence to each aspect of the screening protocol was not evaluated, so they cannot conclude that the improvement in oral health screening was a direct result of any individual component of the protocol.

Inconsistent provider documentation also made it difficult to assess how the providers were implementing OHRAs, oral health anticipatory guidance, and dental referrals prior to this project. Many of these outcome measures were assessed as $n = 0$ during the initial chart review, likely due to variable provider documentation and coding. Because dental referrals were made within the organization and not to an external provider, these referrals were also not consistently captured in the EMR prior to implementing this project. This limitation was addressed by creating the standard order set for the oral health screening protocol. This standardized template helped providers to adhere to the main components of the protocol and helped to track quality improvement for this project.

Several challenges related to the COVID-19 pandemic were faced while implementing this project. First, the organization's decision to not begin FV applications during well-visits was likely influenced by the financial burden that resulted from decreased revenue throughout the pandemic. The design of the staff education for this project was also impacted by the COVID-19 virus. Due to infection precautions, a pre-recorded educational video was used for staff to watch remotely, instead of offering an in-person session. This virtual education likely had disadvantages, such as having less opportunities for questions and discussion among the staff and presenter.

Implications

The findings of this quality improvement project have several implications for future health care practice, health policy, quality measures, and education. The results suggest that educating providers about a routine screening protocol and reminder system can effectively improve OHRAs, identification of children at high-caries risk, oral health anticipatory guidance, and dental referrals during well-visits. Primary care providers should use these findings to implement similar protocols in their own facilities. If these protocols are already in place, physicians and nurse practitioners should be motivated to implement them on a routine basis. Health care organizations should also continue to designate oral health champions who can oversee pediatric oral health screening processes and monitor quality measures over time. With consistent use of these strategies, OHRAs, FV applications, oral health anticipatory guidance, and dental referrals will likely become the standard of care during pediatric well-visits in primary care.

Health policy and quality measures should also be influenced by the findings of this quality improvement project. Insurance payers in NJ currently reimburse oral health services in primary care on a limited basis (AAP, 2019). This coverage should extend to all policies in the United States, in order to motivate providers to offer all components of pediatric oral health screening during well-visits, including FV applications. Additionally, policies should be created that reward primary care facilities for incorporating oral health services into their routine well-child care, similar to the incentives offered for being a Patient-Centered Medical Home (National Committee for Quality Assurance, 2020). Specific quality metrics, such as children receiving biannual OHRAs and FV applications during well-visits, should be established to motivate primary care practices to offer these services. Past research shows the benefits of these practices for improving oral health and overall health, and the findings of this project show that these services can be effectively integrated into standard well-child visits.

Finally, health care education should be impacted by the findings of this quality improvement project. Universities should begin incorporating detailed education on pediatric oral health screening practices into medical and nursing programs, so that physicians and nurses will be adequately prepared to incorporate them into routine practice. Similarly, primary care facilities should make oral health screening part of routine training for all health care providers. As demonstrated through this quality improvement project, provider education on routine OHRAs, oral health anticipatory guidance, and dental referrals during well-visits can effectively increase utilization of these evidence-based practices in primary care.

Conclusion

The most common chronic disease to affect children, ECC, is undervalued and undermanaged in primary care. Despite facing several barriers, including the COVID-19 pandemic, this project effectively improved the quality of several aspects of pediatric oral health screening at a FQHC in Southern New Jersey. After three months of implementing a routine screening protocol, reminder system, and provider education, a significant clinical improvement was seen in OHRAs, identification of children at high-risk for caries, oral health anticipatory guidance, and dental referrals. OHRAs increased 94.6%, identification of children at high-risk for caries increased 14.7%, oral health anticipatory guidance increased 30.2%, and dental referrals increased 100%. In addition, all patients assessed as high-risk for caries received oral health anticipatory guidance and referrals to the affiliated dentist for FV and routine dental care. This FQHC was given a solid foundation for incorporating pediatric oral health screening into routine well-visits and will likely begin offering FV applications during well-visits once resources are available.

The findings of this quality improvement project were disseminated, so that other primary care practices can implement similar protocols in their own offices. Future studies should examine ways to increase efficiency of the screening process, to monitor provider adherence, and to track completed dental referrals. Evidence shows that screening for caries risk and recommending preventative measures will lead to decreased incidence of ECC and improved overall health in the pediatric population. The findings of this project are expected to play a considerable role in making oral health screening practices the standard of care during well-visits for young children in primary care.

References

Achembong, L. N., Kranz, A. M., & Rozier, R. G. (2014). Office-based preventive dental program and statewide trends in dental caries. *Pediatrics, 133*(4), e827-e834. http://doi.org/10.1542/peds.2013-2561

American Academy of Pediatrics. (2011). Oral health risk assessment tool. https://www.aap.org/en-us/Documents/oralhealth_RiskAssessmentTool.pdf

American Academy of Pediatrics. (2014). Maintaining and improving the oral health of young children. *Pediatrics, 134*(6), 1224-1229. http://doi.org/10.1542/peds.2014-2984

American Academy of Pediatrics. (2020a). Coding for pediatric preventive care 2020. https://www.aap.org/en-us/documents/coding_preventive_care.pdf

American Academy of Pediatrics. (2020b). Oral health practice tools. https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Oral-Health/Pages/Oral-Health-Practice-Tools.aspx

American Academy of Pediatric Dentistry. (2014). Policy on early childhood caries (ECC): Classifications, consequences, and preventive strategies. American Academy of Pediatric Dentistry Reference Manual V 36/NO 6. http://www.aapd.org/media/Policies_Guidelines/P_ECCClassifications.pdf

Centers for Disease Control and Prevention, Program Performance and Evaluation Office. (2018). Evaluation guide: Developing and using a logic model. https://www.cdc.gov/dhdsp/docs/logic_model.pdf

Centers for Disease Control and Prevention. (2019). Children's oral health. https://www.cdc.gov/oralhealth/basics/childrens-oral-health/index.html

Chou, R., Cantor, A., Zakher, B., Mitchell, J. P., & Pappas, M. (2014). Prevention of dental caries in children younger than 5 years old: Systematic review to update the U.S. preventive services task force recommendation. http://doi.org/NBK202090

Clark, M. B., Douglass, A. B., Maier, R., Deutchman, M., Gonsalves, W., Silk, H., Wrightson A. S., Quinonez, R., Dolce, M. C., Dalal, M., Rizzolo, D., & Sievers, K. (2010). Smiles for life: A national oral health curriculum, 3rd Ed. Society of Teachers of Family Medicine. https://www.smilesforlifeoralhealth.org/buildcontent.aspx?tut=555&pagekey=62948&cbreceipt=0.

Clark, M. B., & Slayton, R. L. (2014). Fluoride use in caries prevention in the primary care setting. *Pediatrics, 134*(3), 626-633. https://doi.org/10.1542/peds.2014-1699

Dickson, A. L. & Fontana, M. (2018). How to bring oral health to primary care. *Contemporary PEDS Journal, 35*(6). https://www.contemporarypediatrics.com/view/how-bring-oral-health-primary-care

Dye, B. A., Thornton-Evans, G., Li, X. & Iafolla, T. J. (2015). Dental caries and sealant prevalence in the children and adolescents in the United States, 2011-2012. *NCHS data brief, 191*,1–8.

Fraihat, N., Madae'en, S., Bencze, Z., Herczeg, A., & Varga, O. (2019). Clinical effectiveness and cost-effectiveness of oral-health promotion in dental caries prevention among children: Systematic review and meta-analysis. *International Journal of Environmental Research and Public Health, 16*(15), 2668. http://doi.org/10.3390/ijerph16152668

Hagan, J. F., Shaw, J. S., & Duncan, P. M. (2017). Bright futures: Guidelines for health supervision of infants, children, and adolescents [pocket guide] (4th ed.). American Academy of Pediatrics.

Harnagea, H., Couturier, Y., Shrivastava, R., Girard, F., Lamothe, L., Bedos, C. P., & Emami, E. (2017). Barriers and facilitators in the integration of oral health into primary care: A scoping review. *BMJ Open, 7*(9), e016078. http://doi:10.1136/bmjopen-2017-016078

Lewin, K. (1947). Group decision and social change. Readings in social psychology, 3(1), 197-211.

Makvandi, Z., Karimi-Shahanjarini, A., Faradmal, J., & Bashirian, S. (2015). Evaluation of an oral health intervention among mothers of young children: A clustered randomized trial. *Journal of Research in Health Sciences, 15*(2), 88-93. http://doi.org/1955

Moyer, V. A. & on behalf of the U.S. Preventative Services Task Force. (2014). Prevention of dental caries in children from birth through age 5 years: US Preventive Services Task Force recommendation statement. *Pediatrics, 133*(6), 1102-1111.

National Committee for Quality Assurance. (2020). Patient-centered medical home (PCMH). https://www.ncqa.org/programs/health-care-providers-practices/patient-centered-medical-home-pcmh/

Nelson, J. D., Spencer, S. M., Blake, C. E., Moore, J. B., & Martin, A. B. (2018). Elevating oral health interprofessional practice among pediatricians through a statewide quality improvement learning collaborative. *Journal of Public Health Management & Practice, 24*(3), e19-e24. http://doi:10.1097/PHH.0000000000000622

N.C. Department of Health and Human Services. (2020). Into the Mouths of Babes. https://publichealth.nc.gov/oralhealth/partners/IMB.htm

Office of Disease Prevention and Health Promotion. (2019). Search the data: Oral health. https://www.healthypeople.gov/2020/data-search/Search-the-Data#topic-area=3511;

Okah, A., Williams, K., Talib, N., & Mann, K. (2018). Promoting oral health in childhood: A quality improvement project. *Pediatrics, 141*(6). https://doi.org/10.1542/peds.2017-2396

Quinonez, R. B., Kranz, A. M., Lewis, C. W., Barone, L., Boulter, S., O'Connor, K. G., & Keels, M. A. (2014). Oral health opinions and practices of pediatricians: Updated results from a national survey. *Academic Pediatrics, 14*(6), 616-623.

Sengupta, N., Nanavati, S., Cericola, M., & Simon, L. (2017). Oral health integration into a pediatric practice and coordination of referrals to a collocated dental home at a federally qualified health center. *American Journal of Public Health, 107*(10), 1627-1629. http://doi.org/10.2105/AJPH.2017.303984

Stephens, M. B., Wiedemer, J. P., & Kushner, G. M. (2018). Dental problems in primary care. *American Family Physician, 98*(11), 654–660.

Quality Improvement Innovation Networks (QuINN). (2009). Brightening oral health: Teaching and implementing oral health risk assessments in pediatric care project. Brightening Oral Health Workgroup and Quality Improvement Innovation Networks, American Academy of Pediatrics.

U.S. Department of Health and Human Services. (2000). Oral health in America: A report of the Surgeon General. *NIH publication*, 155-188.

U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services. (2016). Early and periodic screening, diagnostic, and treatment: 2014 National Data. https://www.medicaid.gov/medicaid/benefits/epsdt/index.html

U.S. Department of Health and Human Services, Health Resources and Services Administration. (2014). Integration of oral health and primary care practice. https://www.hrsa.gov/sites/default/files/hrsa/oralhealth/integrationoforalhealth.pdf

COVID-19 Pandemic Related Challenges and Nurses' Work Lives

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Abstract

Background: Nurses as frontline healthcare workers (HCWs) were at the forefront of managing the Coronavirus Disease-19 (COVID-19) pandemic. From the outside, nursing during the peak of the pandemic appeared to be strenuous physical work and long hours caring for those with COVID-19. A plethora of additional secondary challenges that resulted from the excessive physical work, deficient resources, and overstressed healthcare systems significantly added to the magnitude of the impact of COVID-19. As a result, the way nurses conducted their practice changed significantly. The co-interaction of the work, personal and social-environmental as well as other associated challenges contributed to the overall quality of work lives (QWL). Perception of QWL has the potential to influence overall job satisfaction. Understanding the challenges is the first step in addressing the challenges. It is imperative for nurse leaders and administrators to understand the challenges faced by nurses during the COVID-19 pandemic.

Objective: The purpose of this study was to examine how COVID-19 had changed work for nurses and the challenges they faced during the COVID-19 pandemic.

Methods: A cross-sectional design was used to collect data about the QWL of nurses and related challenges during the 2020 SARS COVID-19 pandemic in New Jersey.

Results: Personal and professional challenges faced by the nurses' included disproportionate staffing, high workload, and lack of resources to do their job. Lack of educational resources was the most faced challenge by nurses.

Conclusions: While some of the challenges were beyond administrative control due to the disproportionate and unexpected increase in the caseloads, the incorporation of strategies to address these challenges has implications for future preparedness and support for the nursing workforce which is facing an acute crisis on top of the pre-existing nursing shortages.

Keywords: *COVID-19 pandemic, quality of work lives (QWL), Nurses' QWL, COVID-19 related challenges*

Background

The delivery of healthcare to SARS COVID-19 patients overwhelmed healthcare systems worldwide as well as in the United States (US) in 2020. The demands for nursing care have never been as high as they were during the peak of the pandemic and beyond. Post pandemic crisis has just begun and the impact in terms of the challenges with recruitment of new nurses and retention of those in the existing workforce is at the center of the nursing workforce crisis. The personnel costs attached to the receding nursing workforce need much attention. Recruitment and retention issues are related to the burnout from the COVID-19 pandemic as well as the working conditions after the peak of the pandemic. As the number of cases rose to millions among the general population in the US, the Centers for Disease Control and Prevention (CDC) estimated 470, 942 cases of COVID-19 and 1557 deaths associated with COVID-19 among healthcare professionals in the US (CDC, 2021). Kaiser Health Network report, which included data from nursing homes and health facilities, estimated the COVID-19 associated healthcare worker deaths even higher at 2900 (Jewett et al., 2021). As per Masson (2021), nurses comprised 32% of healthcare workers who lost their lives to COVID-19.

COVID-19 is highly transmissible and associated with a high risk of morbidity and mortality. The risk of contracting COVID-19 and infecting others is especially high among HCWs who work on the frontlines caring for COVID-19 patients. Healthcare workers who are older, with chronic conditions, and in the US those who belong to minority populations are at an even greater risk for morbidity and mortality from COVID-19 (Hughes et al., 2020). Individual vulnerabilities of HCWs were complicated by changes in work responsibilities and challenges that were unique to the COVID-19 pandemic. Some of the challenges and changes in work responsibilities included providing direct care to COVID-19 patients, unprecedented increase in patient volume, critical shortages of personnel and personal protection equipment, and rapidly evolving updates to COVID-19 protocols (Avadhani, 2021; Avadhani et al., 2021). The assessment of quality of work lives (QWL) provides insights into the multi-dimensional interaction of work, personal and social environments, and their contributions to the overall quality of life. According to Walton (1975) QWL comprises of fair compensation, safety and security at work, professional development and social integration, work-life balance, and the relevance of work life. Lanctot et al. (2012) described QWL as the interaction of interpersonal, physical, and structural aspects of a person's work environment and working conditions. QWL influences job satisfaction, employee performance, and organizational performance, factors critical to the success of an organization. Any changes to the work environment, working conditions, social and personal surroundings influence the QWL according to the research conducted by Avadhani (2021). Due to this intersectionality of the multitude of factors that contribute to QWL, the understanding of nurse-reported ratings of COVID-19 related challenges can serve as a planning tool for advocates and administrators interested in improving the QWL and related job satisfaction, employee, and organizational performance (Shu-Ching et al., 2020).

Nursing workforce shortages were predicted even prior to the COVID-19 pandemic and are only expected to be severely affected by the COVID-19 pandemic. According to the United States Health and Human Services, Health Resources and Services Administration's National Center for Health Workforce Analysis, New Jersey ranked number three only behind California and Texas in the predicted shortage of nurses based on the demand and supply for the year 2030 (NCSBN, 2021). The National Center for Health Workforce Analysis also identified Stress on the Job as one of the important factors responsible for nursing shortage (USHHS, 2019). Therefore, to support the nurses and their work, there is a need to understand the challenges they face so that the solutions to the challenges could be put in place before the pre-pandemic nursing shortage turns into a tsunami of nursing shortage. In this paper, we report on practicing nurses' self-perceived challenges during the COVID-19 pandemic and how the pandemic influenced their work and lives in general. Our findings can contribute to better prepare healthcare systems for future healthcare challenges and support the nursing workforce going forward.

Methods

A cross-sectional design was used to collect data about the QWL of nurses and related challenges during the 2020 SARS COVID-19 pandemic in New Jersey. Using Dillman's Total Design Method (Hoddinott & Bass, 1986), a Qualtrics online survey software, and an email invitation was sent to the New Jersey State Nurses Association (NJSNA) active members, 6000 registered nurses licensed in New Jersey. Dillman's total design method is survey research method that incorporates questions that are designed to be appealing to the participants and simple, realistic questions easily gain attention and improve participation (Hoddinott & Bass, 1986). In the case of this survey research, the questions were simple, practical, and relatable to the nurses due to the impact of COVID-19 on their QWL. The study was approved by the university's Institutional Review Board. The invitation contained a link to the survey and consent form in Qualtrics.

The survey was comprised of a demographic questionnaire and Walton's QWL Questionnaire. In addition to demographics questions, the survey also included questions about the perceptions of the prevalence of changes where the participants had the opportunity to select more than one

challenges that they identified with. Additionally, the survey also included a comparative analysis to assess if a specific challenge had increased or decreased compared to the pre-pandemic phase. Questions pertaining to challenges faced during the COVID-19 pandemic included work safety, childcare support access, remote education for children, mental health issues, social isolation, economic hardships, limited recreation opportunities, access to basic necessities, family health safety, keeping up to date with evolving COVID-19 related practice/protocol changes, as well as a 'please specify other' free text option was included. The effects of challenges faced at work and home were further studied by understanding the associations to each of the QWL dimensions from Walton's QWL. The questionnaire consists of 35 items related to adequate and fair compensation; a safe and healthy environment; the development of human capacities; growth and security; social integration; constitutionalism; the total life space; and social relevance. The QWL questionnaire is a 5-point Likert type scale (very dissatisfied 1 to very satisfied 5), with an overall score ranging from 35-175. Data were analyzed with SPSS 27.0 (IBM, Corp., Armonk, NY, USA). Descriptive statistics analyses summarized the study variables; one-way ANOVA was used to assess the associations between challenges faced at work and at home and QWL during the COVID-19 pandemic among RNs in New Jersey. Sidak post hoc comparisons were conducted to assess the mean differences between challenges faced at work and at home. All statistical analyses utilized a p-value of 0.05 to establish statistical significance.

Results

A total of 225 respondents participated in the study. The mean age of the sample was 50.14 (*SD* = 12.39, range = 20-80) and the average number of years participants worked as registered nurses were 24.27 (*SD* = 13.67, range = 1-59). Of these 91.6% (*n* = 206) identified as female, and 87.6% (*n* = 197) preferred she/her pronouns. The majority (*n* = 145, 64.4%) were non-Hispanic White while 8.9% (*n* = 20) identified as Hispanic or Latino. More than 69% (*n* = 156) were married and 38.7% (*n* = 87) reported having children who lived with them. Majority (*n* = 104, 46.2%) had completed a master's degree, 36.9% (*n* = 83) were Advanced Practice Nurses, 83.1% (*n* = 187) worked full-time and 48.9% (*n* = 110) worked in an acute care setting. Details of demographic information can be found in Table 1 (see Table 1).

Table 1

Demographic Characteristics of Study Participants

Demographic Characteristics	*n*	%
Gender		
Female	206	91.6
Male	19	8.4
Pronouns		
He/Him	19	8.4
She/Her	197	87.6
They/Them	2	0.9
Not Reflect	5	2.2
Race		
White	145	64.4
Black/African American	17	7.6
Asian	32	14.2
More than one race	12	5.3
Other	18	8.0
Ethnicity		
Hispanic/Latino	20	8.9
Non-Hispanic/Latino	124	55.1
Other	74	32.9
Education Preparation		
Diploma RN	1	0.4
Associates Degree	11	4.9
Bachelor's Degree	59	26.2
Master's Degree	104	46.2
Doctoral Degree	50	22.2
Marital Status		
Single	41	18.2
Married	156	69.3
Partnered	6	2.7
Widowed	5	2.2
Divorced	15	6.7
Separated	1	0.4
Primary Job Role		
Staff Registered Nurse	69	30.7
Advanced Practice Nurse	83	36.9
Nurse Administrator	23	10.2
Nurse Educator	29	12.9
Other	20	8.9
Workplace		
Acute Care Hospital	110	48.9
Long-term Care Acute Care Facility	7	3.1
Nursing Home	4	1.8
Outpatient/Ambulatory Care Setting	40	17.8
Community/Home Health	5	2.2
Other	59	26.2

SARS COVID-19 Infection

Of the respondents, 13.3% (*n* = 30) were infected by the virus, while 26.7% (*n* = 60) had to quarantine because of potential exposure to the virus. It was not established if the exposure to the virus was work-related. However, keeping in consideration the circumstances where there were no other social life events, the chances of work-related exposure remains high. Only one respondent from this study had to be hospitalized because of the COVID-19 infection. This finding means that this one respondent was severely ill as under the circumstances with the shortage of hospital beds, the hospitalization was limited to only severely ill and hypoxic patients. Of the total, 18.7% (*n* = 42) reported that family members had contracted the virus. Using the stipulation that all other businesses did not operate under social and physical contact during the pandemic, the likelihood of family members contracting the virus from the nurses remains high.

Physical and Mental Health

The most common chronic disease reported by the respondents was hypertension (*n* = 31, 8.8%). Asthma and other respiratory issues were reported by 14 (6.2%), while Diabetes Type II and thyroid issues were reported by six (2.6%), and obesity was reported by five (2.2%). Some respondents also reported mental health issues prior to the COVID-19 pandemic (*n* = 14, 6.2%). Of these, anxiety was reported by ten (4.44%), depression by eight (3.65%), and posttraumatic stress disorder by three respondents (1.33%).

Challenges faced at work and at home

Nurses were asked about change (increase or decrease) in the challenges they had faced at work and at home during the peak of the pandemic. The individual areas of challenges that increased included challenges with staffing, workload, resources to do the job, PPE, work from home as well as resources for infection prevention. Work-related challenges that increased, included workload (*n* = 164, 72.9%), decreased resources to do the job (*n* = 118, 52.4%), and decreased staffing (*n* = 93, 41.3%). The challenges related to the resources available to do the job, personal protective equipment (PPE) was reported to have increased by 29.3% (*n* = 66), while a decrease was reported by 42.7% (*n* = 96) of the respondents. Around two-thirds (*n* = 141, 62.7%) of the respondents stated that the challenges related to the educational resources about infection prevention had increased, while 26.2% (*n* = 59) stated that they had remained unchanged. However, 11.6% (*n* = 26) respondents stated that the challenges related to their workload had not changed, 19.6%

(*n* = 44) stated that the challenge related to the resources to do the job had increased, and 33.8% (*n* = 76) said that staffing challenge had remained unchanged. The challenges faced by the study participants are compiled in Table 2 (See Table 2).

Further, the prevalence of specific challenges that the participants identified with, were also asked (see Table 3). The most commonly reported challenge at work and home were to keep up to date with evolving COVID-19 related practice/protocol changes (*n* = 142, 16.34%). Work safety related to working with COVID-19 patients was the second most common challenge (*n* = 136, 15.65%). Personal challenges reported by the respondents included social isolation (*n* = 113, 13%), limited recreation opportunities (*n* = 125, 14.38%), family health safety (*n* = 102, 11.74%), mental health concerns (*n* = 63, 7.25%), remote education for children at home (*n* = 54, 6.21%), and (*n* = 36, 4.14%) reported economic hardship. Details of the challenges faced at work and home can be found in Table 3 (see Table 3). There were a variety of additional challenges reported under this section. In addition to the personal life situations, loss of loved ones as well as mental and physical health stressors, the challenges related to remote nursing education as well as loss of clinical sites also came through. The challenges reported under the free text option under other are included in Table 4 (see Table 4).

Challenges Faced at Work and at Home and Associations with QWL Subscales

Effects of challenges faced at work and home were also studied to identify associations with the eight QWL subscales (compensation, work safety and working conditions, opportunities to use and develop human capacities, opportunities for growth and security, social integrations, constitutionalism, work and total lifespan, social relevance). The associations of the challenges related to staffing, workload, resources to do the job, PPE, work from home as well as

Table 2

Challenges Faced at Work and at Home

	Increase *n (%)*	Decrease *n (%)*	Unchanged *n (%)*
Staffing	50 (22.2)	93 (41.3)	76 (33.8)
Workload	164 (72.9)	28 (12.4)	26 (11.6)
Resources to do the job	44 (19.6)	118 (52.4)	55 (24.4)
PPE	66 (29.3)	96 (42.7)	56 (24.9)
Work from home	87 (38.7)	16 (7.1)	110 (48.9)
Educational resources for infection prevention	141 (62.7)	18 (8.0)	59 (26.2)

Table 3

Challenges Faced at Work and at Home

Challenges	%	n
Work safety	15.65%	136
Childcare support access	2.42%	21
Remote education for children	6.21%	54
Mental health issues	7.25%	63
Social isolation	13.00%	113
Economic hardships	4.14%	36
Limited recreation opportunities	14.38%	125
Access to basic necessities	5.29%	46
Family health safety	11.74%	102
Keeping up to date with evolving COVID-19 related practice/protocol changes	16.34%	142
Other, please specify	3.57%	31

Resources to do the Job
Changes in resources to do the job showed significant associations with all eight subscales of QWL and overall QWL. The post-hoc tests indicated the effect of resources on the job changes on all eight subscales of QWL and overall resources to do the job, had increased significantly during the COVID-19 pandemic.

Personal Protective Equipment (PPE)
Changes in PPE showed significant associations with all eight subscales of QWL and overall QWL. The post-hoc tests also indicated effect of PPE changes on all eight subscales of QWL and overall QWL had increased significantly during the COVID-19 pandemic.

Work from Home
The results showed significant associations between work-from-home changes and the overall QWL. Specific sub-

resources for infection prevention with the substrates of QWL including compensation, work safety and working conditions, opportunities to use and develop human capacities, opportunities for growth and security, social integrations, constitutionalism, work and total lifespan, social relevance is discussed below and the details can be found in Table 5 (See Table 5).

Staffing
The analysis of variance showed significant associations between staffing and work conditions ($p = 0.001$), opportunities (to use and develop human capacities, and opportunity for growth and security) ($p = 0.017$), work and total lifespan ($p = 0.010$), social relevance ($p = 0.001$). Specific dimensions of QWL that did not achieve statistical significance with staffing included: Compensation ($p = 0.54$), opportunities to use and develop human capacities ($p = 0.105$), social integrations ($p = 0.301$), and constitutionalism ($p = 0.09$). It must be noted that despite having a non-statistically significance in a few of the QWL dimensions, the overall QWL attained statistical significance during the post hoc analyses ($p = 0.03$).

Workload
The analysis of variance showed significant associations between workload changes and all eight subscales of QWL and overall QWL. In addition, the post-hoc tests indicated effect of workload changes on all eight subscales of QWL and overall workload, had increased significantly during the COVID-19 pandemic.

Table 4

Additional Challenges Reported via Free Text Option

Marital and family relational issues
Difficulty doing psych/mh by phone
Clinical Training Suspended. No work.
Escalating panic & anxiety sx from my patients, overload of cases
Overwhelming request for services, long work hours, treating patients (college students) who went to their home states and then couldn't find providers due to COVID-19.
My manager still doesn't wear her mask!
Initial loss of work hours and school participation
Asked to work at the bedside in ICU caring for Covid patients, created a proning team and educated the staff involved how to carefully prone patients who were potential candidates and met the Berlin criteria for pronation therapy
Working double the hours with teaching online. Much more time consuming with student needs and concerns. Stress of learning all the new means and methods with online nursing education
No clinical for nursing students
Mental health support of students
I got divorced
Overall stress level
Not mental health issues but increased stress r/t virtual/on-line work from home and all the emails-overload of info regarding COVID
Lost job
HORRIBLE workload, overloaded online classes
Mandatory overtime and no time off for months
Almost all of the choices
Childcare, remote learning, & mental health
Teaching remotely
Death in family
More than one in this category
Stress
I had gotten covid 19

Table 5

Effects of Challenges Faced at Work and at Home on QWL

Quality of Work Life	Staffing F (sig)	Workload F (sig)	Resources to do the job F (sig)	PPE F (sig)	Work from home F (sig)	Educational resources for infection prevention F (sig)
Compensation	2.97 (.054)	10.65 (< .001)	12.84 (< .001)	16.71 (< .001)	1.56 (.213)	7.44 (.001)
Work and Safety Conditions	7.52 (.001)	16.06 (< .001)	16.04 (< .001)	14.92 (< .001)	3.75 (.025)	8.60 (< .001)
Opportunities to Use and Develop Human Capacities	2.28 (.105)	9.03 (< .001)	8.77 (< .001)	7.93 (< .001)	2.03 (.134)	2.87 (.059)
Opportunities for Growth and Security	4.16 (.017)	10.60 (< .001)	12.41 (< .001)	9.50 (< .001)	4.23 (.016)	6.36 (.002)
Social Integrations	1.21 (.301)	6.31 (.002)	9.72 (< .001)	6.58 (.002)	2.40 (.093)	7.20 (.001)
Constitutionalism	2.43 (.091)	9.86 (< .001)	13.13 (< .001)	15.87 (< .001)	3.36 (.037)	4.74 (.010)
Work and Total Lifespan	4.69 (.010)	20.63 (< .001)	9.47 (< .001)	4.86 (.009)	2.74 (.067)	3.27 (.040)
Social relevance	6.95 (.001)	8.08 (< .001)	6.90 (.001)	12.29 (< .001)	12.51 (< .001)	11.40 (< .001)
Overall QWL	3.54 (.031)	14.03 (< .001)	14.52 (< .001)	14.21(< .001)	4.31 (.015)	9.92 (< .001)

strates of QWL that achieved statistical significance included: Work safety conditions ($p = 0.025$), the opportunity for growth and security) ($p = 0.016$), constitutionalism ($p = 0.037$), social relevance ($p < .001$). The QWL dimensions and their associations with work from home that did not attain statistical significance in this study included compensation ($p = 0.213$), social integrations ($p = 0.093$), work, and total life span ($p = 0.067$), and opportunities to use and develop human capacities ($p = 0.134$). It must be noted that the post-doc tests conducted by combining all the dimensions of the QWL were statistically significant ($p = 0.015$)

Educational Resources for Infection Prevention
This study showed that changes in educational resources for infection prevention were significantly associated with seven subscales of QWL and overall QWL. The association with opportunities to use and develop human capacities at work was not significant. The post-hoc tests indicated effects of educational resources for infection prevention

changes on seven subscales of QWL and overall QWL, had increased significantly during the COVID-19 pandemic.

Discussion
Our sample characteristic of female dominance is more pronounced than the national average. Nursing is a female-dominated profession and our sample was overwhelmingly female at 91.9% compared to 73.3% female in national study (NCSBN, 2021; USHHS, 2019) It must be noted that the female predominance in nursing has been showing a positive trend of increase in males joining the nursing (NCSBN, 2021) The average age of the participants also representative of the actual nursing workforce which was 50.5 years for our study compared to the average age of 51 years in the national nursing workforce study in 2013, 2015 and 2017 (NCSBN, 2021). Similar to the national demographic, the majority of the participants were Caucasian as well. Other significant demographic information included the baseline hypertension, diabetes, and respiratory illnesses in a small group of participants. Overall baseline health of the

sample was reported to be reasonably fair as the percentage of respondents that reported diabetes, hypertension, obesity, respiratory diseases, and mental health issues as preexisting conditions were anywhere from 1.33-8.8% (see demographic section). Limitations of this study include the sample size and the inclusion criteria which was not limited to direct patient care nurses only. The nurse participants in this study included Advance Practice Nurses (APNs) from various specialties. While some of the APNs could be direct patient care providers in the acute care hospital, this information was not collected. Additionally, there were also nurse administrators and nurse educators who may not be direct care providers.

SARS COVID-19 Infection

COVID-19 brought the entire world and its operations to a standstill. The government, the businesses, travel, schools, and any other operations that required human interactions had to be shut down. These shutdowns were warranted due to the highly contagious nature of the virus and its catastrophic transmission rate. Keeping in consideration the overall transmissibility of the COVID-19 infection, a small percentage of our sample (13.3%) contracted COVID-19 infection. This small group also included one participant who required hospitalization due to the infection. This low rate of infection among nurses could be attributed to various factors including the high quality of infection control prevention measures including PPE despite its limited supply. Extreme infection control measures, as well as the vigilance used by the nurses in this group is noteworthy.

Challenges faced at work and at home

Work safety was perceived to be an important concern reported by participants in our study. Self-perceived concerns related work safety while providing care to the patients with highly contagious COVID-19 can be understood and comparable to the data for all healthcare workers (CDC, 2021; Jewett et al., 2021). Extremely high transmissibility coupled with high morbidity and mortality as well as the fear of the unknown in case of a novel disease has the potential to add to the concerns regarding work safety for the nurses. Concern for safety did not end with work, the safety of the family members and loved ones was also a concern as the nurses had to return home with a worry that the COVID-19 virus could potentially travel to their homes and spread to their family members and loved ones.

Resources to do the job in a high acuity work environment where the staffing, PPE, and other resources were scarce due to the disproportionately increased demand, was an important and realistic but understandable concern. The nursing workforce shortage was deeply exacerbated while it is well known that the nursing workforce demand has been much higher than the supply, to begin with. One of the important resources that the nurses reported to be a signifi-

cant challenge was the shortage of educational resources. Evidence-based practice is foundational to nursing and due to the novelty of the COVID-19 virus, the evidence was not yet fully formed. Therefore, the need and the lack of educational resources were resoundingly significant in our study. The need for educational resources, ongoing research to add to evidence should be given utmost importance. Nursing administrators should invest in research and other evidence-based resources to support the work of nurses in the frontlines.

QWL of the nurses in the frontlines can be supported by supporting their work, providing them with the resources for their jobs including the educational resources. The need for resources for the job should be based on objective assessments. Periodic educational needs assessments to assess the educational needs of the nurses can help identify priorities for ongoing education of nurses. The health care environment and needs undergo constant changes, and it is important to address the work-related challenges on an ongoing basis.

Challenges faced at work and at home and associations with QWL substrates

Our findings for statistically significant associations between the self-perceived challenges faced by nurses and the substrates of QWL support the hypothesis that changes to work and the challenges related to QWL have a significant impact on the QWL dimensions posited by Walton (1975). Our findings of associations of work-life and its association with work-related challenges are in line with Lanctot et al. (2012) where the author emphasized the interaction of all aspects of a person's work with the QWL. These findings are also in line with another mixed methods study by Avadhani (2021) where the influence of changes to the work environment on work-life as a result of an organization on employee work-life was concluded.

The COVID-19 pandemic was a unique event that did not spare anyone's life. Many people were directly impacted by COVID-19 because they got infected with the virus, their family members were infected, or some aspect of their work or life grossly changed due to the business closures and deficiency of other resources. Any changes in QWL manifested by COVID-19 should be understood in the context of the magnitude of the COVID-19 pandemic. Yet, our findings highlight the limitations of our healthcare institutions and the lack of preparedness our healthcare systems to face such challenges. The COVID-19 pandemic essentially flipped the healthcare systems upside down, inside out and resulted in major changes to the QWL. The onslaught of COVID-19 did not allow any transition time to allow participant nurses to organize and balance their work and home lives. It is important to note that the previously projected nursing shortage is further exacerbated by the

large numbers of nurses leaving the profession due to various workloads, work environments, and work safety issues that arose from the COVID-19 pandemic (USHHS, 2019).

Conclusions

Our study has implications for nursing and healthcare administrators. Ongoing and long-lasting consequences of the COVID-19 pandemic warrant the health systems to be prepared to endure the workload related to pandemics and other unpredictable changes of the future. The nursing workforce is the backbone of any healthcare system regardless of its size. Attention to the QWL and the challenges related to the QWL is crucial to creating a sustainable nursing workforce of the future. Periodic analysis of the needs of the nursing workforce aimed at supporting the nurses' work lives appears to be a viable strategy in sustaining the current nursing workforce and solving the nursing shortage.

References

Avadhani, A. (2021). Nursing higher education mergers: Do the benefits outweigh the risks. *Journal of Nursing Higher Education and Practice, 11*(6), 16-25. http://doi.org/10.5430/jnep.v11n6p16.

Avadhani, A., Porter, S., Zha, P., & Qureshi, R. (2021). Supporting the nursing workforce: Lessons from the pandemic. *Sigma's 32nd International Nursing Research* VIRTUAL Congress, July 21-23, 2021.

Centers for Disease Control and Prevention. (2021). Cases and deaths among healthcare personnel. https://covid.cdc.gov/covid-data-tracker/#health-care-personnel.

Shu-Ching, C. H. E. N., Yeur-Hur, L. A. I., & Shiow-Luan, T. S. A. Y. (2020). Nursing perspectives on the impacts of COVID-19. *Journal of Nursing Research, 28*(3), e85.

Hoddinott, S. N., & Bass, J. M. (1986). The Dillman total design survey method: A sure-fire way to get high survey return rates. *Canadian Family Physician, 32*(1), 2366-2368.

Hughes, M., Groenewold, M. R., Lessem, S. E., Xu, K., Ussery, E. N., Wiegand, M. S., Qin, X., Do, T., Thomas, D., Tsai, S., Davidson, A., Latash, J., Eckel, S., Collins, J., Ojo, M., McHugh, L., Li, W., Chen, J., …Stuckey, M.J. (2020). Update: Characteristics of healthcare personnel with COVID-19-United States, Feb 12-July 16, 2020. Center for Disease Control and Prevention-Mortality and Morbidity Report. https://www.cdc.gov/mmwr/volumes/69/wr/mm6938a3.htm.

Jewett, C., Lewis, R., & Bailey, M. (2021). More than 2900 healthcare workers died this year and the *government barely kept track. Lost on the Frontline. The Guardian and Kaiser Health News.* https://khn.org/news/article/more-than-2900-health-care-workers-died-this-year-and-the-government-barely-kept-track/

Lanctot, N., Durand, M., & Cobiere, M. (2012). The quality of work-life of people with mental disorders in social enterprises: A qualitative study. *Quality of Life , Research 12*(8), 1415-1423. PMid:22086362. https://doi.org/10.1007/s11136-011-0057-7.

Masson, G. (2021). Nurses account for most known US healthcare worker COVID-19 deaths: Guardian, KHN, March 17, 2021. *Becker's Hospital Review.* https://www.beckershospitalreview.com/public-health/nurses-account-for-most-known-us-healthcare-worker-covid-19-deaths-guardian-khn.html.

National Council of State Boards of Nursing. (2021). *National Nursing Workforce Study.* https://www.ncsbn.org/workforce.htm.

United States Health and Human Services. (2019). Health Resources and Services Administration, National Center for Health Workforce Analysis Brief Summary of Results from the 2018 National Sample Survey of Registered Nurses-2019. https://data.hrsa.gov/DataDownload/NSSRN/GeneralPUF18/nssrn-summary-report.pdf.

Walton, R. E. (1975). Criteria for quality of working life. In LE. Davis, A.B. Cherns and Associates (Eds.). *The Quality of Working.* New York.

JOURNAL OF NURSING PRACTICE APPLICATIONS & REVIEWS OF RESEARCH

Transitioning to a Virtual Classroom: Impact on Pathophysiology and Pharmacology Course Success

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Abstract

Background: It is evident that virtual classrooms are transforming the model of education, however, educators are concerned regarding the low retention rates in virtual classroom courses such as Pharmacology and Pathophysiology. Pharmacology and Pathophysiology courses have been identified as high attrition courses in pre-licensure nursing courses with students preferring face-to-face versus virtual classes.

Objective: This project evaluated the impact of transitioning to virtual classrooms during the COVID-19 pandemic on student success in Pharmacology and Pathophysiology courses for pre-licensure baccalaureate degree nursing program.

Methods: Data from both face-to-face and virtual classroom were collected and analyzed from 2019 - 2021 in Pathophysiology ($n = 312$) and Pharmacology ($n = 288$) courses.

Results: Chi-square analysis indicates no significant differences between face-to-face and virtual instructional delivery methods and the likelihood of failing either Pathophysiology or Pharmacology courses.

Conclusions: The findings of this program evaluation indicate that the integration of innovative teaching practices contributes to the success in the online teaching of Pharmacology and Pathophysiology.

Keywords: virtual classroom, nursing program, Pharmacology, Pathophysiology, online teaching strategies

Background

Virtual learning has the potential of providing the same benefits as face-to-face learning. However, this is dependent on how courses are designed and taught in virtual learning spaces. One aspect of virtual learning in nursing programs has been the ability to offer courses to larger numbers of enrollees across a wider geographic area. Although distance learning provides notable advantages, it presents many challenges to individuals taking Pathophysiology and Pharmacology classes. Challenges such as less face-to-face contact with faculty to clarify questions and content, may increase failures rates and threaten the goal of graduating greater numbers of students (Bezerra, 2020). Online learning requires a constant online presence during lectures to ensure students understand all the concepts. Face-to-face learning provides equal chances for all learners to access learning materials and lessons. Nursing students have reported a negative psychosocial effect resulting from the absence of physical interactions with other learners and instructors (Langegård et al., 2021). It can be challenging to understand practical concepts in the absence of physical presence. This practice is possible in physical learning but challenging to achieve in virtual education. Consequently, learners may acquire the theoretical knowledge of the course but fail to understand the application to clinical care.

Prior to the COVID 19 pandemic, Pharmacology and Pathophysiology courses were identified as high failure courses in an accredited pre-licensure nursing program in South Florida. The courses are heavy with essential concepts equipping students with the foundational knowledge required for clinical nursing applications. The need to shift to online learning, created by the COVID 19 pandemic, created uncertainties for both educators and learners and suggested the need to compare in-class learning outcomes with the virtual learning platform. The purpose of this program evaluation was to assess the implication of transitioning to a virtual classroom on student success/failures in Pathophysiology and Pharmacology in a pre-licensure baccalaureate degree nursing program.

Literature Review

The concepts and practices of online learning have developed over the years because of the convenience, effectiveness, and efficiency this method provides. However, students do not always prefer this method. Christopher (2018) found in a study with medical students that they attributed their failure in Physiology, Pharmacology, Pathophysiology, and Anatomy to virtual learning. MacIntyre (2016) noted a similar difficulty in these courses among students in the traditional face-to-face programs. Students viewed their failure to the absence of physical contact with the educator. These courses also have a practical component, for example active learning strategies such as formative assessment through clinical cases to learn critical thinking which is challenging to achieve in distance learning.

Technology has greatly advanced, which has made it possible to have an exceptional virtual classroom. However, Zuspan (2017) posits that non-traditional students learning virtually have a higher failure rate compared to traditional students learning in the campus environment. Interestingly, some students perceived the flipped methods to be unstructured and took more processes of thinking and planning. This assertion is supported by Logan and colleagues (2013) who reported that online classes were often unstructured, which precluded students preparing prior to classes. They also found the need to ask the instructors questions is a crucial factor in the success of these learning areas. Hence, it is important to integrate components of the traditional learning environment in virtual classes to provide the feeling of contact and the ability to ask questions and have content clarified.

Teaching strategies integrating the use of resources such as Pictionary™ for illustration, Smarty Pance™ for content, and fun quizzing options like Kahoot™, Socrative™, Nearpod™, and Polleverywhere™ enhance the retention abilities of virtual nursing learners. The American Association of Colleges of Nursing (AACN) developed the Vision Statement for Academic Nursing (2019) to inspire leaders in nursing education to seek opportunities for innovative learning and develop curricular models to advance nursing programs to meet the dynamic needs of their patients and healthcare organizations.

Method and Analysis

This program evaluation utilized the Plan-Do-Study-Act (PDSA) process as a problem-solving model as the framework. Student outcome data were collected from two courses, Pathophysiology, and Pharmacology, traditionally taught face-to-face in a pre-licensure baccalaureate nursing program. Data from enrollment in face-to-face courses were compared for courses starting in September 2019 and January 2020. Data from the virtual classroom were collected for courses offered in May 2020 and September 2020. The 288 students enrolled in Pharmacology, and 312 students in Pathophysiology were included in the analysis. One hundred and forty were in the face-to-face Pharmacology and 156 in the face-to-face Pathophysiology courses, while 148 were in the virtual Pharmacology and 156 in the virtual pathophysiology courses. Tables 1 and 2 present the pass/fail rates for the students in these classes.

Chi-square analysis was used to calculate the likelihood of passing or failing either Pharmacology and Pathophysiology classes in relation to the instructional delivery (face-to-face or virtual learning) using SPSS Version 26. Chi-square analysis indicated no significant differences between instructional delivery methods and pass/fail rate for either

Table 1

Pharmacology Pass/Fail Rates

Instructional Delivery Method	Students receiving grade of "Pass"	Students receiving grade of "Fail"	Total
Face-to-Face, on campus	129 (observed value) 127.85 (expected value) *Residual = 1.5*	11 (observed value) 12.15 (expected value) *Residual = -1.15*	140
Virtual Learning	134 (observed value) 135.15 (expected value) *Residual = -1.15*	14 (observed value) 12.84 (expected value) *Residual = 1.16*	148
	263	25	*N = 288*

Table 2

Pathophysiology Pass/Fail Rates

Instructional Delivery Method	Students receiving grade of "Pass"	Students receiving grade of "Fail"	Total
Face-to-Face, on campus	140 (observed value) 141 (expected value) *Residual = -1*	16 (observed value) 15 (expected value) *Residual = 1*	156
Virtual Learning	142 (observed value) 141 (expected value) *Residual = 1*	14 (observed value) 15 (expected value) *Residual = -1*	156
	282	30	*N = 312*

pathophysiology ($\chi 2$ (1, $N = 312$) = 0.14, $p > .05$) or Pharmacology ($\chi 2$ (1, $N = 288$) = 0.23, $p > .05$) courses. There was no statistically significant difference between instructional delivery methods and the likelihood of passing/failing either Pathophysiology or Pharmacology.

Results indicate that the integration of innovative teaching practices has contributed to the success in the online teaching of Pharmacology and Pathophysiology. The faculties for both courses have utilized these teaching strategies in their classrooms during the virtual transition. The faculty utilized various video conference technologies, such as WebEx™, Blue Big Button™, and Microsoft Teams™. Lectures and tutoring were provided in a synchronous format which closely replicated the face-to-face approach. Advancements in technology have made it possible to have an exceptional virtual classroom and for faculty to continuously be connected with their students. Students were encouraged to interact with the faculty regardless of learning programs (online studies or face-to-face). The increase in

student-teacher interaction helped the students be more engaged in the classroom and their commitment to success in their courses.

Supportive Online Teaching Strategies
Anand (2018) indicates that one of the major challenges in online education stems from the extremely high failure rates in fully virtual classes as compared to traditional classes thought to be due to lack of social presence and classroom connection. Different strategies have been applied to facilitate the shift from traditional teaching and learning methods to online learning. Teaching strategies used by various institutions' faculties include the use of breakout rooms, chat box, gaming, Google Forms™ and virtual remediation. In the online learning environment, breakout rooms allow for the formation and running of small learning groups in a class. These groups promote interactions, which are necessary for good performance in different learning areas. In the breakout room, activities can be planned that encourage teamwork and encourages individual participation. Instruc-

tors can also effectively and closely interact with students while closely monitoring their progress.

The chat box allows learners and instructors to interact easily, overcoming the challenge of distance. A live chat enables the participants in a class to discuss in real-time. Furthermore, this tool makes the learning process easier and leads to a better understanding of the coursework.

Through Google Forms™, free online software that can be used in creating surveys and quizzes, instructors can engage learners in the study process, improve their class participation, and assess their learning progress. Moreover, the use of this tool increases efficiency while reducing the paperwork involved in learning. Games such as crossword puzzles, Jeopardy™, Kahoot™, Socrative™, and near pod increase the learning capacity of students in virtual learning. Games such as crossword puzzles are vital in eradicating the stress that accompanies higher education. Moreover, it increases social bonds among the learners in the online learning environment.

Nursing students also use Socrative™ games. Socratic questioning is essential in Pharmacology and Pathophysiology as it engages learners in critical thinking and problem-solving. Kahoot™ is a game-based learning platform that allows the creation of quizzes and shares with students in minutes. This game makes classes more interesting by curbing the monotony presented by a similar class routine during each lecture session. Furthermore, studies report an increased motivation for learning for students in institutions that use games to complement learning (Ramos-Morcillo et al., 2020). Therefore, games improve diverse sectors of learner's abilities. Using Nearpod™, learners can connect the activities and concepts they learn in class to real-life situations. Games are therefore crucial in promoting effective learning in virtual learning environments.

Educational institutions should advocate the use of technologies that facilitate learning, assessment of learning, and assessment for learning to address the fundamental issue in the health professions fragmented educational system (Weber et al., 2021). The university provided resources like virtual workshops for students. A "workshop" is a live educational event led by a trained facilitator. The workshop may be hosted face-to-face or virtually and may last one hour or more, depending on the learning objectives established in the session. The workshops are interactive, and the facilitator usually engages the learners through various methods, including question and answer, NCLEX™- style, video clips, and peer response.

Nursing educators need to be familiar in navigating the changing landscape of nursing education. They are instrumental in re-evaluating teaching pedagogies, develop-

ing, and designing innovative learning structure to meet the competency for the nurse of the future. To maintain the highest standard of quality and excellence in the nursing program the faculty need to be engage in professional development of knowledge, skills and competency and pursue continuous improvement in their role (National League of Nursing, 2022).

Limitations

Several limitations can be identified in this project. First, the impact of the project on the psychosocial and physical environment, predictors of student learning such as learning style and technological background or knowledge were not included, which needs further exploration and statistical testing. Secondly, the project focused only on two nursing courses out of the 18 courses offered at the university. This is an avenue for researchers to investigate the effect of virtual learning on the student outcome and NCLEX© scores on a bigger scale. Finally, the course content has been enhanced with innovative approaches to learning and may offer a favorable result in the future.

Conclusions

Pathophysiology and Pharmacology in a pre-licensure baccalaureate degree nursing program are essential courses since they equip nursing students with the knowledge required to grasp concepts that will serve as a foundation for nursing practice. In addition, nursing faculty need to develop strategies for increasing the relevance of online programs to the ever changing healthcare environment.

The project's findings have contributed to identifying the faculty's needs to address students' learning needs. Professional development on innovating teaching and learning has taken place in the university, as well as resources and support were offered for the faculty to deliver online teaching effectively. Furthermore, the organization has created a new model to respond to the Institute of Medicine (IOM) call. The IOM (2011) discussed the significance of strengthening the educational traditions by creating new teaching practices, which include the use of technology grounded in research and evidence-based practice. The effectiveness of the education process depends on the ability of institutions to utilize the appropriate tools to enable the success of pre-licensure baccalaureate nursing programs

References

American Association of Colleges of Nursing. (2019). AACN's vision for academic nursing. https://www. aacnnursing.org/Portals/42/News/White-Papers/Vision-Academic-Nursing.pdf

Anand, A. (2018). Failure rate and reasons for failure in medicals schools worldwide: An analysis. *Texila International Journal of Basic Medical Sciences, 3*(1), 1-7. https://doi.org/10.21522/tijbms.2016.03.01.art001

Bezerra, I. M. P. (2020). State of the art of nursing education and the challenges to use remote technologies in the time of corona virus pandemic. *Journal of Human Growth and Development, 30*(1), 141-147. http://dx.doi.org/10.7322/jhgd.v30.10087

Christopher, S. V. (2018). Students' perceptions of a flipped classroom approach to paramedic theory. *British Paramedic Journal, 2*(4), 1–9. https://doi.org/10.29045/14784726.2018.03.2.4.1

Langegård, U., Kiani, K., Nielsen, S. J., & Svensson, P. A. (2021). Nursing students' experiences of a pedagogical transition from campus learning to distance learning using digital tools. *BMC Nursing, 20*(1), 23–23. https://doi.org/10.1186/s12912-021-00542-1

Logan, P., Dunphy, J. L., McClean, R., & Ireland, M. F. (2013). Six years of teaching human bioscience, pathophysiology and pharmacology: A journey of reflective practice. *International Journal of Innovation in Science and Mathematics Education, 21*(3).

MacIntyre, J. I. S. (2016). *Newly graduated baccalaureate registered nurses, the 21st century health care environment and mapping the landscape for curricular change.* [Doctoral Dissertation, University of Prince Edward Island]. IslandScholar Robertson Library. http://islandscholar.ca/islandora/object/ir:21168/datastream/PDF/download/citation.pdf

National League of Nursing. (2022). *Nurse educator core competencies.* https://www.nln.org/education/nursing-education-competencies

Ramos-Morcillo, A. J., Leal-Costa, C., Moral-García, J. E., & Ruzafa-Martínez, M. (2020). Experiences of nursing students during the abrupt change from face-to-face to e-learning education during the first month of confinement due to COVID-19 in Spain. *International Journal of Environmental Research and Public Health, 17*(15), 5519. https://doi.org/10.3390/ijerph17155519

Weberg, D., Chan, G. K., Dickow, M., (2021). Disrupting nursing education in light of COVID-19. *OJIN: The Online Journal of Issues in Nursing, 26*(4), Manuscript 4. https://doi.org/10.3912/OJIN.Vol26No01Man04

Zuspan, R. (2017). *Online RN to BSN education: Characteristics of student success.* [Doctoral Dissertation, The Patton College of Education of Ohio University]. https://etd.ohiolink.edu/apexprod/rws_etd/send_file/send?accession=ohiou149070446994361&disposition=inline

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