

Associations Between the COVID-19 Pandemic and New Nurses' Transition to Practice Outcomes: A Multi-site, Longitudinal Study

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Background: The transition between nursing school and nursing practice has been well studied and recognized as a turbulent time for new nurses. Existing literature suggests that transition to practice (TTP) programs can successfully support new nurses through this challenging period. However, TTP program outcomes have not been studied related to the COVID-19 pandemic, which altered TTP experiences for many new nurses by limiting their access to clinical sites for hands-on patient care experience and shifting delivery of nursing education and TTP programs from in-person to virtual environments. **Purpose:** The purpose of this study was to analyze the associations between TTP outcomes and the COVID-19 pandemic. **Methods:** This was a retrospective correlational, longitudinal study using secondary analysis of Vizient /AACN Nurse Residency Program survey data from the Casey-Fink Graduate Nurse Experience Survey and the Nurse Resident Progression Survey. Self-reported data from new nurses in Southeast Texas who participated in a standardized TTP program before the COVID-19 pandemic (2017–2019) were compared with self-reported data from nurses who participated in the TTP program during the pandemic (2020 and 2021). **Results:** A total of 2,673 nurses participated in this study. When adjusting for demographic composition of the cohorts, statistically significant differences ($p < .05$) were identified in the advocacy, patient safety, and commitment outcomes with a decline in change scores from baseline to 12 months in the COVID-19 pandemic cohort compared to the pre-COVID-19 pandemic cohort. **Conclusion:** Our findings provide new information on the impact of the COVID-19 pandemic on new nurses' participating in a standardized TTP program. The results indicate that patient safety and commitment to staying employed in the organization and the nursing profession should be priority improvement areas for employers and TTP program staff as they work to support new nurses' TTP in a pandemic.

Keywords: Transition to practice, nurse residency program, new graduate nurses, education, COVID-19

Emerging evidence suggests that the COVID-19 pandemic has impacted many facets of the healthcare system, nursing education, and the nursing workforce (Alexander et al., 2021; Bultas & L'Ecuyer, 2022; Crismon et al., 2021; Smith et al., 2021), including close to 400,000 new nurses who passed the nursing licensing examination and became eligible to transition to practice (TTP) from nursing schools in the midst of the pandemic (National Council of State Boards of Nursing [NCSBN], 2023). During the pandemic, new nurses who were transitioning reported experiencing changes in their clinical and academic preparation resulting from reduced clinical site experiences and the quick switch from in-person to online learning (Alsalamah et al., 2022; Bultas & L'Ecuyer, 2022; Powers et al., 2022; Ulmen et al., 2022). Furthermore, the pandemic caused interruptions to many hospitals' TTP programs, which negatively impacted new nurses (Crismon et

al., 2021; Bultas & L'Ecuyer, 2022; Smith et al., 2021). Although the existing research provides valuable insights into the impact of the COVID-19 pandemic on TTP for new nurses, it is limited to single sites and small samples (Alsalamah et al., 2022; Bultas & L'Ecuyer, 2022; Crismon et al., 2021; Healy et al., 2022; Powers et al., 2022; Smith et al., 2021). The purpose of the present study was to expand the knowledge base on the topic by examining the differences across several standardized TTP measures in multiple cohorts of new nurses across 13 hospitals in Southeast Texas who participated in the Vizient/AACN (American Association of Colleges of Nursing) Nurse Residency Program (NRP) before and during the pandemic. The results of the study point to specific TTP outcomes for nurses participating in a standardized TTP program that were impacted by the COVID-19 pandemic that nurse

educators and clinical leaders should prioritize for improvement to ensure positive outcomes for new nurses and their patients.

Literature Review

Upon graduation from nursing school, new nurses must transition the knowledge and skills they have learned in school into actual practice. This period, known as TTP, has been extensively studied in research conducted prior to the pandemic (Aldosari et al., 2021; Chappell & Richards, 2015; Dwyer & Hunter Revell, 2016; Goode et al., 2018; Mellor et al., 2017; Tyndall et al., 2018; Warren et al., 2018). Additionally, research on the impact of the COVID-19 pandemic on TTP is now emerging (Alsalamah et al., 2022; Bultas & L'Ecuyer, 2022; Crismon et al., 2021; Healy et al., 2022; Powers et al., 2022; Smith et al., 2021; Ulmen et al., 2022).

Even before the pandemic, many new nurses reported struggling to successfully transition from a student to a nurse (Aldosari et al., 2021; Bultas & L'Ecuyer, 2022; Hallaran et al., 2022; Russell & Juliff, 2021; Smith et al., 2021; Ulupinar & Aydogan, 2021). New nurses felt unprepared for practice, lacked confidence in their skills and care coordination abilities, experienced heavier workloads than expected, and had insufficient communication and professional skills (Hallaran et al., 2022; Ulupinar & Aydogan, 2021). Feelings of being overwhelmed led new nurses to lose confidence or leave their jobs (Aldosari et al., 2021; Doughty et al., 2018; Ulupinar & Aydogan, 2021), with 50.9% of new graduate nurses reporting that they were planning to leave their employer and 42.5% reporting that they were considering leaving nursing altogether in the years prior to the pandemic (Ulupinar & Aydogan, 2021).

To help close the education-practice gaps, many hospitals utilize TTP programs or NRPs for nurses' first year of employment (Aldosari et al., 2021; Bultas & L'Ecuyer, 2022; NCSBN, n.d.; Russell & Juliff, 2021). Research prior to the COVID-19 pandemic showed that TTP programs help transition new nurses into practice by providing support to increase new nurses' knowledge, skills, and abilities (Russell & Juliff, 2021). Several authors attributed an overall improvement in new nurses' competence and confidence to participation in TTP programs (Aldosari et al., 2021; Russell & Juliff, 2021; Ulupinar & Aydogan, 2021; Van Camp & Chappy, 2017). Similarly, Spector et al. (2015) found that hospitals with standardized TTP programs that focus on quality and safety competencies, clinical reasoning, reflection, and specialty knowledge in an area of practice were associated with better TTP outcomes.

A handful of studies have examined the impact of the COVID-19 pandemic on TTP. The pandemic caused many nursing students to lose hospital-based clinical experiences and hands-on knowledge application opportunities (Crismon et al., 2021; Powers et al., 2022; Ulmen et al., 2022). One organization found that 67.5% of new nurses had fewer clinical practice experiences than their pre-pandemic counterparts, resulting in the nurses feeling overwhelmed, concerned for lack of efficiency, afraid of making

mistakes after their orientation, and deficient in hands-on skills resulting from a lack of significant practice repetition (Smith et al., 2021). During the pandemic, new nurses also experienced altered orientation plans, rapid changes to hospital policies, and increased workloads, which exacerbated new nurses' stress, workload, and the discrepancy between their expectations and reality. A longitudinal study on new nurses' TTP experience during the pandemic revealed that 96% of new nurses rated their experience as negative and reported an inability to form effective peer relationships, lowered confidence in their preparation and abilities, and increased concern for personal health and safety (Bultas & L'Ecuyer, 2022). In a survey of nurse faculty about their perceptions of the impact of the COVID-19 pandemic on new nurses' TTP, faculty were most concerned about the loss of hands-on learning in clinical settings and emphasized the need to counteract the loss of clinical experiences in school through enhanced TTP programs and mentorship on the job (Powers et al., 2022).

Two published studies examined the outcomes of new nurses who participated in standardized TTP programs. Healy et al. (2022) conducted a single-site study of 99 new nurses in the United States comparing a pre-pandemic cohort of new nurses participating in an in-person Vizient/AACN NRP to a pandemic cohort of new nurses who participated in a virtual Vizient/AACN NRP. The authors reported no differences across scores from the Casey-Fink Graduate Nurse Experience Survey that measured new nurses' perceptions of support, patient safety, stress, communication/leadership, professional satisfaction, and job satisfaction, and the Vizient/AACN NRP Nurse Resident Progression Survey that measured advocacy, collaboration, leadership, and commitment. In a study of 29 new nurses from Saudi Arabia who were in a standardized NRP, Alsalamah et al. (2022) found that new nurses reported challenges with TTP but believed that the NRP offered enhanced learning and peer support.

Research Questions

Our study sought to build on the existing research by examining the associations between several self-reported TTP outcome measures and the COVID-19 pandemic in nurses across multiple hospitals who participated in a standardized NRP. Using robust methods and a large sample size, we sought answers to the following research questions:

1. What are the differences in TTP outcome measures of new nurses who transitioned to practice in 2017–2019 (pre-COVID-19 cohort) compared with those who transitioned in 2020 and 2021 (COVID-19 cohort) at baseline?
2. What are the differences in TTP outcome measures of new nurses transitioning to practice in in the pre-COVID-19 cohort compared with the COVID-19 cohort at 12 months?
3. What are the associations between changes from baseline to 12 months in TTP outcome measures and COVID-19 exposure

adjusting for differences in demographic variables such as gender, ethnicity, degree, and grade point average (GPA)?

The TTP period offers a unique opportunity for employers to assess gaps in essential competencies and implement interventions to close any gaps that can negatively affect organizational performance (Aldosari et al., 2021; Russell & Juliff, 2021). Thus, the results of our study could provide information on competency gaps specific to the COVID-19 pandemic according to new nurses' perspectives.

Methods

Study Design

We used a correlational longitudinal design to analyze self-reported survey data previously collected and stored in the Vizient/AACN NRP database (Vizient, 2023) using two Vizient/AACN NRP survey instruments: the Casey-Fink Graduate Nurse Experience Survey (Casey & Fink, 2015; Fink et al., 2008) and the Nurse Resident Progression Survey (Vizient, n.d.) at baseline and 12 months from nurses transitioning to practice from 2017 to 2021 across 13 hospitals in a single health system in Southeast Texas. The data collection points (baseline and 12 months) were set by Vizient/AACN NRP to correspond with the beginning and end of the 1-year residency program. The study received exempt status from the UTHHealth Houston Committee for the Protection of Human Subjects because the data were anonymized at the participant and institutional levels.

Sample and Setting

The sample was comprised of new nurses from 13 hospitals in a large not-for-profit health system in Southeast Texas who participated in the health system's Vizient/AACN NRP. The health system's first formal NRP program started in January 2010 at the health system's flagship academic hospital utilizing the UHC/AACN NRP framework, which is now known as the Vizient/AACN NRP. In 2014, the program expanded to 13 hospitals within the health system using the 12-month NRP framework (Y. Short, personal communication, October 19, 2022). Hospital and nursing orientation take place at the campus level with nurse residents meeting regularly throughout the year to interact with peers and grow their professional skill set. Due to the program's large size, new nurses are divided into 2 to 3 groups that meet monthly at residency seminars. The seminars are designed utilizing the Vizient/AACN NRP curriculum and focus on topics such as the role of the professional nurse, quality outcomes, and leadership at the bedside. Nurse residents also network with peers from throughout the system through specialty core curriculum classes. These classes provide foundational education and training in the following nursing specialties: inpatient acute care, critical care, emergency care, perinatal services, perioperative services, pediatrics, and neonatal intensive care. Nurse residents are required to attend classes and to complete an evidence-based practice proj-

ect. Experienced nurses at both the system and facility level provide oversight and assistance with these projects as needed. Nurse residents present their projects at the completion of the program (Vizient, n.d.). While the program content stayed the same during the pandemic, the program delivery was shifted from an in-person to a web-based environment.

Beginning in fiscal year 2017, three groups of new nurses were onboarded per year. On average, the health system accepts approximately 526 nurse residents into the program annually with a 1-year retention rate of 96%. The new nurses in the study sample were defined as those who had less than 12 months of work experience (Y. Short, personal communication, October 19, 2022).

Data Collection

The health system collected data regarding new nurses from its 13 hospitals in collaboration with Vizient. New nurses who participated in the Vizient/AACN NRP responded to surveys via an electronic portal. The responses to the surveys were submitted electronically into Vizient and automatically entered into their database. A data coordinator from Vizient then prepared and shared data from the Vizient database with the research team for analyses. The data contained no personal or individual hospital identifying information. All participants in the Vizient/AACN NRP surveys completed a consent form acknowledging that the data from the surveys may be used for research purposes. The nurses were not mandated to complete the anonymous surveys, and the anonymous data were only reported in aggregate. Nurses were not required to respond to all survey items.

Outcome Measures

Outcome measures were selected from the pre-existing Vizient/AACN NRP surveys to answer the proposed research questions. The predictor measures included time (baseline and 12 months) and the COVID-19 pandemic status, measured as a dichotomous variable with "no exposure" for the control group of new nurses transitioning to practice in 2017, 2018, and 2019 and "positive exposure" for the cohorts of new nurses transitioning to practice in 2020 and 2021. The covariate measures included age, gender, ethnicity, nursing degree type, and GPA.

The outcome measures included the following scales from the Casey-Fink Graduate Nurse Experience Survey (Casey & Fink, 2015; Fink et al., 2008; Healy et al., 2022): support (9 items; e.g., "I feel supported by the nurses on my unit"), patient safety (5 items; e.g., "I feel I may harm the patient due to my lack of knowledge and experience"), overall stress (1 item: "I am experiencing stress in my personal life"), communication/leadership (6 items; e.g., "I feel comfortable communicating with patients and their families"), professional satisfaction (3 items; e.g., "I am satisfied with my chosen nursing specialty"), and job satisfaction (9 items; e.g., "Satisfaction with work responsibilities"). Outcome measures also included the following scales from the Nurse Resident Progression Survey that were used in prior research (Healy et al., 2022): advo-

cacy (18 items), collaboration (6 items), leadership (13 items), and commitment (14 items). Total scores were divided by the number of questions, resulting in a score that corresponded closely to the Likert scale used for the survey questions. Likert scale values ranged from 1 to 4, where 1 represented strong disagreement and 4 implied strong agreement. The exception was the job satisfaction scale, which had response options that ranged from 1 (representing very dissatisfied) to 5 (representing very satisfied).

Content validity was reported previously for both surveys (Casey & Fink, 2015; Fink et al., 2008; Healy et al., 2022). We conducted an internal consistency reliability analysis for the survey measures using baseline (0 months) data in the studied sample and found acceptable Cronbach alpha scores across all multi-item scales: support (.826), patient safety (.734), communication/leadership (.755), professional satisfaction (.768), job satisfaction (.849), collaboration (.727), leadership (.965), commitment (.926), and advocacy (.951).

Analysis

Baseline and 12-month characteristics were described as frequency (%) for categorical variables and as mean (SD) for continuous variables. Descriptive statistics were stratified by pre-COVID-19 and COVID-19 cohorts. Distributions of demographic variables were compared with two-sample *t* tests for age and chi-squared tests for gender, ethnicity, degree, and GPA. Propensity scores (Blackford, 2009) were calculated from logistic regression in order to adjust for demographic differences in subsequent models. To minimize the impact of missing demographic data, propensity scoring models were investigated with and without variables that had large fractions of missing values (i.e., age, ethnicity, and GPA). Akaike information criteria (AIC) indicated that age and ethnicity were not necessary, but GPA was important to include in the model. Thus, the final scoring model included degree, GPA, and gender. The longitudinal analysis was carried out with linear mixed effects models (Bates et al., 2015) for each scale score. Fixed effects included the interaction of time and COVID-19 exposure along with the propensity score. The presence of a significant interaction term indicated that improvement in a given scale's mean score over 12 months was unequal in the study cohorts. Statistical analyses were done using R software version 4.0.3 or later (2020), and $\alpha = .05$ was used for statistical inference. Post hoc power calculations were performed using G*Power 3.1 using Cohen's method for repeated measures design, with $\alpha = .05$ (Faul et al., 2009).

Results

Data were available for 2,673 new nurses from 13 hospitals who were enrolled in the TTP program; 1,475 of the nurses were enrolled in either 2017, 2018, or 2019 (before the COVID-19 pandemic) and 1,198 entered in 2020 (after March) or 2021 (after the COVID-19 pandemic began). Sample sizes and demographic characteristics of the sample are displayed in Table 1. Ethnicity distri-

butions differed in the cohorts, with the COVID-19 cohort having fewer participants who self-identified as White and more who self-identified in each of the other ethnic groups compared with the pre-COVID-19 cohort. The cohorts also differed in education; there were more bachelor's degree nurses with higher GPAs in the COVID-19 cohort. Age and gender compositions of the cohorts were similar before and during the COVID-19 pandemic.

Not all new nurses responded to the surveys at either baseline or 12 months; thus, the number of available responses in the dataset dictated the sample size. However, post hoc power calculations showed that the smallest survey response number in the dataset ($N = 780$ observed at 12 months for the COVID-19 cohort) was sufficient to provide at least 80% power to detect a small effect ($\eta^2 = 0.01$) due to the interaction of time and the cohorts. When missing values were considered, the smallest count was $N = 597$ for the 12-month advocacy scale in the COVID-19 cohort, for which the power stayed above 79.9% to detect the small effect.

Descriptive statistics of the scale scores at baseline and 12 months and stratified by COVID-19 exposure are shown in Table 2. The results from linear mixed models are displayed in Table 3. The descriptive trends in TTP outcomes appear similar for nurses transitioning to practice before and during the COVID-19 pandemic. Overall, leadership/communication, leadership, and patient safety scores tended to be lower compared to advocacy and collaboration scores at baseline and 12 months in all cohorts, but each of these scales, with the exception of collaboration, had noted improvements from baseline to 12 months. Support, job satisfaction, professional satisfaction, and commitment showed a decrease from baseline to 12 months in all cohorts.

Stress scores were stable from baseline to 12 months in the pre-COVID-19 cohort. The COVID-19 cohort reported a small increase in stress from baseline ($M = 2.34$; $SD = 0.83$) to 12 months ($M = 2.41$; $SD = 0.83$), but the difference in the score changes between the study cohorts was not statistically significant ($p = .361$). The advocacy score increased in both cohorts over 12 months, but the increase was smaller in the COVID-19 cohort ($p = 0.21$). The mean score of advocacy was almost the same at 12 months before ($M = 3.43$; $SD = 0.42$) and during ($M = 3.45$; $SD = 0.41$) COVID-19, while the initial value of the advocacy score was slightly higher in the cohorts during ($M = 3.26$; $SD = 0.45$) versus before ($M = 3.20$; $SD = 0.46$) COVID-19. Patient safety scores increased over 12 months in both groups, but the increase was smaller in the COVID-19 cohort ($p < .001$). Moreover, the mean patient safety score was higher initially during ($M = 2.80$; $SD = 0.44$) compared to before ($M = 2.73$; $SD = 0.47$) COVID-19 and lower at 12 months during ($M = 3.05$; $SD = 0.51$) compared to before ($M = 3.13$; $SD = 0.48$) COVID-19. Commitment scale scores decreased over 12 months in both groups, with a slightly larger decrease during COVID-19 (from $M = 3.25$; $SD = 0.42$ to $M = 2.81$; $SD = 0.50$) compared to pre-COVID-19 (from $M = 3.28$; $SD = 0.40$ to $M = 2.86$; $SD = 0.49$) ($p = .017$). Other

TABLE 1
Participant Demographics by Study Cohort

| Characteristic | Pre-COVID-19 (N = 1,475) | COVID-19 (N = 1,198) | p Value ^a |
|---------------------------|-----------------------------|-------------------------|----------------------|
| Age, y, M (SD) | 27 (7) | 27 (7) | .825 |
| Unknown, n | 672 | 240 | |
| Gender, n (%) | | | .427 |
| Female | 1,250 (85%) | 1,028 (86%) | |
| Male | 223 (15%) | 168 (14%) | |
| Unknown, n | 2 | 2 | |
| Ethnicity, n (%) | | | .038 |
| White | 554 (46%) | 416 (40%) | |
| Hispanic or Latino | 242 (20%) | 232 (22%) | |
| Black or African-American | 199 (17%) | 184 (18%) | |
| Asian | 164 (14%) | 169 (16%) | |
| Other | 34 (2.8%) | 38 (3.7%) | |
| Unknown, n | 282 | 159 | |
| Degree Received, n (%) | | | <.001 |
| BSN/BA/BS | 970 (66%) | 854 (72%) | |
| Accelerated BSN | 180 (12%) | 151 (13%) | |
| ADN | 321 (22%) | 189 (16%) | |
| Unknown, n | 4 | 4 | |
| GPA, n (%) | | | .017 |
| <3.5 | 682 (58%) | 634 (53%) | |
| 3.5 | 498 (42%) | 564 (47%) | |
| Unknown, n | 295 | 0 | |

Note. ADN = associate degree in nursing; BA = bachelor of arts; BS = bachelor of science; BSN = bachelor of science in nursing; GPA = grade point average. Unknown data were not included in percentage calculations.
^a Welch two-sample *t* test; Pearson's chi-squared test.

scales did not show evidence of a change in their pattern over 12 months before and during the COVID-19 pandemic.

Discussion

The TTP from education settings is a stressful and challenging experience for new nurses (Aldosari et al., 2021). It is also a critically important period for employers to assess education practice gaps and intervene for positive nurse and patient outcomes (Tyndall et al., 2018). Research is emerging on the impact of the COVID-19 pandemic on new nurses' TTP experiences (Crismon et al., 2021; Bultas & L'Ecuyer, 2022; Smith et al., 2021). Our study adds to this line of inquiry as the first study that compares TTP measures between the cohorts of new nurses who transitioned to practice before and during the COVID-19 pandemic and participated in a standardized TTP.

TABLE 2
Transition to Practice Outcomes at Baseline and 12 Months by Study Cohort

| Scale | Range | Pre-COVID-19, M (SD) | | During COVID-19, M (SD) | |
|--|-------|----------------------|---------------------|-------------------------|-------------------|
| | | Baseline (N=1,420) | 12 Months (N=1,137) | Baseline (N=1,148) | 12 Months (N=780) |
| <i>Casey-Fink Graduate Nurse Experience Survey</i> | | | | | |
| Support | 1-4 | 3.45 (0.40) | 3.37 (0.43) | 3.46 (0.40) | 3.39 (0.41) |
| Unknown, n | | 2 | 2 | 2 | 3 |
| Patient safety | 1-4 | 2.73 (0.47) | 3.13 (0.48) | 2.80 (0.44) | 3.05 (0.51) |
| Unknown, n | | 2 | 2 | 2 | 3 |
| Stress | 1-4 | 2.35 (0.82) | 2.36 (0.82) | 2.34 (0.79) | 2.41 (0.83) |
| Unknown, n | | 2 | 2 | 2 | 3 |
| Communication/ leadership | 1-4 | 2.63 (0.43) | 3.20 (0.41) | 2.69 (0.45) | 3.23 (0.42) |
| Unknown, n | | 2 | 2 | 2 | 3 |
| Professional satisfaction | 1-4 | 3.58 (0.47) | 3.31 (0.54) | 3.54 (0.46) | 3.28 (0.55) |
| Unknown, n | | 2 | 2 | 2 | 3 |
| Job satisfaction | 1-5 | 3.94 (0.57) | 3.69 (0.62) | 3.95 (0.59) | 3.67 (0.65) |
| Unknown, n | | 2 | 2 | 2 | 3 |
| <i>Nurse Resident Progression Survey</i> | | | | | |
| Advocacy | 1-4 | 3.20 (0.46) | 3.43 (0.42) | 3.26 (0.45) | 3.45 (0.41) |
| Unknown, n | | 634 | 309 | 501 | 183 |
| Collaboration | 1-4 | 3.33 (0.43) | 3.31 (0.43) | 3.33 (0.41) | 3.31 (0.43) |
| Unknown, n | | 24 | 33 | 19 | 18 |
| Leadership | 1-4 | 1.98 (0.57) | 2.27 (0.51) | 2.05 (0.57) | 2.32 (0.55) |
| Unknown, n | | 24 | 33 | 19 | 18 |
| Commitment | 1-4 | 3.28 (0.40) | 2.86 (0.49) | 3.25 (0.42) | 2.81 (0.50) |
| Unknown, n | | 24 | 33 | 19 | 18 |

In terms of demographic differences, the new nurses entering practice during the COVID-19 pandemic were more diverse, had a higher overall GPA, and were more likely to have a bachelor's degree, which could be attributed to the long-standing national agenda to increase diversity and the percentage of nurses entering practice with a bachelor's degree. When adjusting for the demographic composition of the cohorts, differences were identified in the changes from baseline to 12 months in advocacy, patient

safety, and commitment scores. The reported increase in the advocacy score from baseline to 12 months was greater in the pre-COVID-19 cohort compared to the COVID-19 cohort, although overall, the COVID-19 cohort had a higher overall baseline and 12-month advocacy score than the pre-COVID-19 cohort. Our finding of increased reported advocacy skills in the COVID-19 cohort is consistent with other reports of new nurses' heightened awareness of the importance of advocating for the patients and themselves during a pandemic (Bultas & L'Ecuyer, 2022; Crismon et al., 2021). Conversely, the patient safety score had a greater increase from baseline to 12 months in the pre-COVID-19 cohort and higher overall scores at baseline and 12 months. The reductions in patient safety align with findings in the literature related to reduced clinical site experiences and reduced in-classroom learning opportunities during the COVID-19 pandemic (Bultas & L'Ecuyer, 2022; Ulmen et al., 2022). Commitment scores decreased from baseline to 12 months, with a greater decline reported in the COVID-19 cohort. The small but statistically significant reduction in commitment in the COVID-19 cohort in our study aligns with other studies that reported decreases in organizational commitment that were exacerbated during the pandemic along with increased burnout, stress, and sense of being overwhelmed (Bultas & L'Ecuyer, 2022; Crismon et al., 2021). In addition, new nurses' organizational commitment commonly decreases after 1 year, leading to high first-year turnover rates, even in organizations with TTP programs (Ulupinar & Aydogan, 2021). It is important to note that although statistically significant, changes in the advocacy and commitment scores were smaller compared to the changes in the patient safety score, which was a concern for nurses' TTP even before the COVID-19 pandemic (NCSBN, n.d.).

Although new nurses reported moderate levels of stress both before and during the pandemic, we were surprised to find that there were no differences in the overall stress between the pre-COVID-19 and COVID-19 cohorts. This finding is inconsistent with other research (Bultas & L'Ecuyer, 2022; Crismon et al., 2021) and informal reports from the front lines. It is possible that the new nurses' transitioning to practice during the pandemic did not have a pre-pandemic comparison experience—in other words, this was their only experience of transition, which was stressful, but not more so than the stress experienced by new nurses before the pandemic. Furthermore, the lack of differences in collaboration, leadership, and communication scores was also unexpected. However, it is possible that TTP programs in our study sites were able to adapt well to the changing environment of the pandemic to continue to successfully support new nurses' TTP experiences.

In terms of key recommendations for regulation, education, and practice based on our and related findings (Healy et al., 2022), which showed some minimal differences in TTP measures between cohorts of nurses before and during the pandemic, it appears that standardized TTP programs such as Vizient/AACM NRP continued to offer the same level of support to new nurses in a pandemic when delivered virtually versus in person prior to the

TABLE 3

Differences in Transition to Practice Outcomes Between Study Cohorts From Baseline to 12 Months

| Scale | β^a | 95% CI | | pValue |
|--|-----------|--------|-------|--------|
| | | Lower | Upper | |
| <i>Casey-Fink Graduate Nurse Experience Survey</i> | | | | |
| Support | 0.00 | -0.04 | 0.04 | .906 |
| Patient safety | -0.15 | -0.20 | -0.11 | <.001 |
| Stress | 0.04 | -0.04 | 0.12 | .361 |
| Communication/leadership | -0.03 | -0.07 | 0.01 | .199 |
| Professional satisfaction | -0.02 | -0.07 | 0.03 | .358 |
| Job satisfaction | -0.05 | -0.11 | 0.00 | .054 |
| <i>Nurse Resident Progression Survey</i> | | | | |
| Advocacy | -0.06 | -0.12 | -0.01 | .021 |
| Collaboration | -0.02 | -0.06 | 0.03 | .430 |
| Leadership | 0.00 | -0.05 | 0.05 | .971 |
| Commitment | -0.05 | -0.09 | -0.01 | .017 |

^a Linear mixed models for each scale are summarized by the interaction term β , which represents the difference in improvement from baseline to 12 months in the COVID-19 cohort relative to the pre-COVID-19 cohort. For example, β of -0.05 represents the difference in negative improvement from baseline to 12 months in the COVID-19 cohort compared to the pre-COVID-19 cohort. The models are adjusted with propensity scores to control differences in distributions of demographic composition of the cohorts.

pandemic. Healthcare facilities should strive for standardized TTP programs with an emphasis on quality and safety nursing education competencies (e.g., quality improvement, patient safety, teamwork), as it is currently their evidence-based position (NCSBN, n.d.). Our study also begins to provide answers to research questions that Alexander et al. (2021, p. 7) pose as part of the *Future of Nursing Regulation Through Research: A Global Agenda*, specifically, "How much in-person, hands-on clinical training is needed for safe, direct patient care?" and the questions regarding the role of virtual nursing education. While new nurses in our study experienced loss of clinical hands-on education and virtual education in school and in their jobs, they reported similar TTP outcomes, necessitating future research into the value of hands-on clinical education.

It is worth noting that the cohorts of new nurses in our study were surveyed in the first year and a half of the pandemic. Experiences of new nurses entering practice in the later stages of the pandemic may differ due to the exacerbated and prolonged staffing shortages that are still in effect. Future research should account for these limitations by exploring differences in TTP outcomes among pre-, early, and late pandemic entrants into practice from across the United States who did and did not participate in the standardized TTP programs. In addition to self-reported perceptions of TTP experiences from new nurses, perceptions of other

key stakeholders need to be explored, including those of hospital nurse educators, managers, and patients. Also, more research is needed to include outcomes pertaining to variables such as retention and patient safety indicators.

Limitations

Our study has several limitations, which may limit the generalizability of our findings beyond the study sample. First, all new nurses in our study were enrolled in the Vizient/AACN NRP; therefore, their TTP experiences and outcomes may differ from those of new nurses who were not enrolled in this or other standardized TTP programs. Furthermore, while this was a multi-site study, all new nurses came from a single hospital system in Southeast Texas, with the majority of participants from a large academic medical center. TTP experiences and outcomes of new nurses from nonurban areas and in other parts of the United States may differ. While we were able to adjust for demographic differences in our analyses, including age, gender, ethnicity, degree type, and GPA, there may be other confounding variables that could influence TTP outcomes such as prior experience working in healthcare, for which we could not account. For example, May 2020 graduates received the bulk of their educational preparation without the hinderance of COVID-19 but were largely impacted during their residency program. Arguably, their experiences were very different than the experiences of those who started in January 2021, as the issues with personal protective equipment and lack of knowledge on effective strategies to prevent transmission of COVID-19 were more impactful for the May 2020 graduates. These differences may have been confounding variables that need to be explored in future analyses.

All of the measures used in the study were self-reported, which may pose some response bias risk. In terms of the large amounts of missing data for the advocacy measure, distributions of the advocacy score at baseline were compared with Kolmogorov-Smirnov tests and found to be similar regardless of the missing advocacy scores at 12 months, lending support to the assumption that advocacy scores were missing at random. Linear mixed models are therefore expected to perform robustly (Snijders & Bosker, 2011) for the advocacy scores despite having a large fraction of missing values. Missing data for the demographic categories of age, ethnicity/race, and GPA, may preclude any conclusions about these results in the comparison of nurse cohorts before and during COVID-19.

Conclusion

Our study provides new information on the impact of the COVID-19 pandemic on new nurses' TTP within a certified TTP program. The results indicate that patient safety and commitment were negatively impacted by the COVID-19 pandemic in new nurses and should be priority improvement areas for academic educators, employers, and TTP program staff. The work environ-

ment, peers, and nursing leadership are influential factors on new nurses' feelings of support and satisfaction, which facilitate or hinder successful TTP (Hallaran et al., 2022). While the COVID-19 pandemic has negatively impacted these important facets of new nurses' TTP experiences, many other domains, including advocacy, leadership, collaboration, communication, and stress, remained unchanged by the pandemic in our study sample. Exploring the ways in which TTP programs were able to adapt to ensure positive experiences for new nurses in the pandemic need to be explored to further inform academic and hospital educators and leaders on best practices for facilitating new nurses' successful transition to practice in future pandemics.

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The research reported in this manuscript has been funded by the National Council of State Boards of Nursing Center for Regulatory Excellence.