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Changes in Posttraumatic Growth After a Virtual Contemplative Intervention During the COVID-19 Pandemic

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OBJECTIVE: The aim of this study was to describe the effects of an intervention called "Compassion & Growth Workshops" on reported posttraumatic growth (PTG) using the Posttraumatic Growth Inventory–Expanded (PTGI-X).
BACKGROUND: Few studies measure the impact of interventions, such as contemplative practices, on nurse PTG.
METHODS: We delivered a series of three 2-hour microretreats to nurses and advanced practice nurses and measured their impact on PTG scores. Using multivariate logistic regression, we identified cofactors predictive of 25% overall improvement on the PTGI-X.
RESULTS: Overall PTG increased among participants, with the greatest improvement in relating to others, new possibilities, and personal strength. Posttraumatic growth improved as workshop attendance increased; nurses providing direct patient care also benefitted the most.
CONCLUSIONS: Contemplative interventions can substantively improve PTG. This may be particularly relevant for coping with COVID pandemic stress among nurses on the frontlines and for healthcare leaders seeking to strengthen psychological support within their teams and reform the workplace environment.

Long before the COVID-19 pandemic, nurses have been susceptible to the psychological trauma of highly challenging patient care and work environments.[1,2] Secondary traumatic stress and posttraumatic stress (PTS), understaffing, toxic work environments, and overly burdensome documentation requirements are few of the well-known contributors to mental and physical health problems for nurses. In addition, work environment stress and burnout not only drive attrition but also compromise patient safety.[3-5] As COVID-19 upended the healthcare workforce, the proportion of nurses experiencing psychological distress, burnout, anxiety, depression, and PTS grew.[6] Presently, RN turnover nationwide is approaching 30% and record numbers plan to leave a seismic human resource loss in large part driven by pandemic stress.[7]

Many studies examine posttraumatic stress disorder (PTSD) and burnout among nurses.[8] Far less is known about factors of self-perceived positive adaptation in response to difficult work events. A recent National Academies of Sciences, Engineering, and Medicine report calls for profound systems-level changes to the clinical environment to support the well-being of nurses.[9] To fully address this, evidence-based approaches

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are needed to support nurses' successful adaptation during and in the aftermath of COVID-19.

Posttraumatic growth (PTG) focuses on change in response to struggling with major challenges and describes empirically derived growth across 5 domains: greater appreciation for life, closer relationships, personal strength, new possibilities, and spiritual or existential development.[10] Posttraumatic growth can occur among individuals, organizations, and communities. The cognitive rebuilding that occurs during the process of PTG is more resistant to future trauma and appears to be a protective factor against trauma-related mental health issues (ie, anxiety and depressive symptoms).[11-13] Longitudinal studies suggest that PTG can persist for years, especially among those with PTSD symptoms.[14,15] Posttraumatic growth is neither an antidote for PTSD nor is it a mitigating factor. Studies show that cooccurring PTG and PTSD or PTS can provide protective support for reducing symptom severity and increased functioning.[16-18] In nurses, experiencing at least 1 dimension of PTG resulting from work-related trauma exposure is a common outcome across multiple settings.[16,19-22]

Notably, it is not the traumatic event itself that solely determines positive or negative outcomes. Rather, it is the struggle to interpret and ascribe meaning to the crisis experiences that shapes PTG.[13,23] The PTG process allows individuals to find a sense of meaning in the trauma through various processes including what Tedeschi and Calhoun[13] call "expert companionship." This camaraderie supports conscious cognitive efforts, also referred to as deliberate reflection, to shape new, stronger perspectives.

Understanding the characteristics of psychological *growth* in response to difficult work events can improve the quality of employer-driven well-being interventions for the nursing workforce even as traumatic events disrupt anticipated day-to-day operations.[24-27] Leveraging evidence-based contemplative practices to foster expert companionship may be a powerful tool for nurse leaders to manage ongoing pandemic consequences among their teams.[13,26,28,29] The purpose of this study was to identify and describe the effects of a novel, virtual contemplative practice-based intervention called "Compassion & Growth Workshops" on PTG. We identify the programmatic and sociodemographic characteristics most predictive of PTG improvement in a cohort of nurses across the United States.

Intervention: Compassion & Growth Workshops

The "Compassion & Growth Workshops" provided 6 hours of live programming via Zoom video streaming.[30] Each workshop consisted of three 2-hour microretreats led by trained facilitators from Emory University, Emory Healthcare, and the University of Virginia. The microretreats were developed from evidence-based contemplative practices known to enhance coping and overall well-being among nurses.[30-35] Table 1 presents a general outline of topic areas and microretreat series objectives. The workshops' 2-hour microretreat

Table 1. *Compassion and Growth Microretreat Objectives*

Microretreat 1: Grounding
In partnership with University of Virginia School of Nursing Compassionate Care Initiative
Resilience retreat: Nurturing Self to Shine as a Clinician
1. Introduce a variety of simple, contemplative practices that support (re)connection with self.
2. Facilitate self-reflection to identify current well-being practices and provide space for peer connection to share those insights.
3. Discuss how to incorporate these practices into daily life.
Microretreat 2: Nurturance
In partnership with Emory University Center for Contemplative Science and Compassion-Based Ethics
CBCT (Cognitively-Based Compassion Training)
1. To understand the psychological construct of compassion as a motivating, energizing factor that is distinct from empathic resonance and empathic distress.
2. To learn a trauma-informed practice ("Connecting to a Moment of Nurturance") that combines emotional awareness with visualization for self-regulation and to learn and implement cognitive reframing strategies via a self-compassion practice.
3. To explore ways to apply these insights and practices to daily life.
Microretreat 3: Growth
In partnership with Emory Healthcare
Practices from Watson's Caritas Model
1. Discuss Dr Jean Watson's Caring theory with focuses on promoting health, preventing illness, caring for the sick, and restoring health based in the humanistic aspects of nursing encompassing scientific knowledge and professional practice.
2. Discuss and practice the translation of leading with heart into practice through expressive work and guidance on how we incorporate Caring Science into daily practice.
3. Explore the different ways of developing and sustaining loving/trusting-caring relationships.
4. Explore creative problem solving and solution seeking in all ways of knowing and thinking to incorporate self-reflective practice in daily work.

sessions were run over a 3-month period. A total of 18 sessions at various times were offered. Workshop facilitators were nurses or professionals who had undergone specific training in each topic area.

Methods

Participants and Procedures

Microretreats

The study recruited registered and advanced practice nurses practicing in the United States through online marketing. Nonnursing healthcare workers were not excluded from participating but were not actively recruited. Participants who declined to complete surveys were not treated differently, and facilitators did not have access to study data. This study was approved as a program evaluation, not human subjects research, by the university's institutional review board.

Participants participated via phone or computer. No data were collected during the sessions, nor were sessions recorded. The sessions were held January through March 2021. All nurses who completed each of the 3 microretreats were awarded continuing education units.

Measures

The preintervention survey included sociodemographic information (Table 2). A short questionnaire was developed by the research team to assess participants' experiences and open-ended questions to obtain additional feedback. Data on PTG were collected immediately prior to the intervention and after the workshop series. Web-based surveys were distributed, and deidentified study data were stored using the Research Electronic Data Capture (REDCap) web application.[36,37]

Preintervention and postintervention PTG was measured by the Posttraumatic Growth Inventory–Expanded Version (PTGI-X).[38] The inventory consists of 25 items rated on a 6-point Likert scale (0 = "I did not experience this change as a result of my crisis" and 5 = "I did experience this change to a very great degree as a result of my crisis"; intermediate options were 2 = "a small degree," 3 = "a moderate degree," and 4 = "a great degree"). The COVID-19 pandemic was stated in the question stem as the reference "my crisis." The PTGI-X has a subscale for each domain; not all subscales had the same number of questions. Consequently, we converted the raw score on each domain and the total score to Likert scale scores (0-5) to directly compare the total, subscale, and question scores.

Data Analysis

The qualitative microretreat feedback data were used to interpret the quantitative findings but not formally analyzed. All data were exported from REDCap to STATA-MP 17.0 for analysis.[39] We summarized participant characteristics using standard visual and numeric descriptive techniques. We explored continuous variables using box plots and histograms. The median and interquartile ranges (IQRs) are reported because no continuous variables were normally distributed. We explored categorical variables using bar charts. We report percentages and number of participants for these variables (Table 2).

The Wilcoxon rank sum test was used to compare differences in baseline characteristics for the

Table 2. *Participant Characteristics, Stratified by Workshop Attendance*

	Attendees	Nonattendees	*P*
Posttraumatic growth			
Baseline PTGI-X score[a]	2.4 (1.2-3.4)	2.1 (1.3-2.9)	0.4820[b]
Sociodemographic factors			
White	68.52 (37)	77.94 (53)	0.301[c]
All other reported races categories (Black, Hispanic, Asian, other)	31.48 (17)	22.06 (15)	
Female	94.44 (51)	95.77 (68)	1.000[c]
Other genders	5.56 (3)	4.23 (3)	
Education and experience			
Associate or bachelor's degree	58.4 (31)	48.5 (33)	0.359[c]
Master's or doctorate degree	41.5 (22)	51.47 (35)	
Early career (0-10 years)	55.81 (24)	75.81 (47)	0.036[c]
Later career (>10 years)	44.19 (19)	24.19 (15)	
Workplace factors			
Currently employed at a Magnet facility	62.26 (33)	51.47 (35)	0.271[c]
Currently providing direct patient care	62.96 (34)	64.29 (45)	1.0[c]

Data are presented as median (IQR) or % (n).
[a]The overall scale is the mean of the scores for each domain.
[b]Wilcoxon rank sum test.
[c]Fisher exact test.

Table 3. Pre- and Post-PTGI-X Scores by Domain

	Total PTGI-X Score Pre-Post		
	Pre	Post	P[a]
PTGI-X[b] total score	2.4 (1.2-2.5)	2.6 (1.7-3.6)	**0.0362**
PTGI-X scores by domain			
Relating to others	2.1 (1.4-3.1)	2.4 (1.6-3.4)	**0.0267**
New possibilities	2.2 (1.2-3.4)	2.2 (1.6-3.8)	**0.0381**
Personal strength	2.8 (1.6-3.8)	2.8 (2-4)	**0.0121**
Spiritual and existential change	3.2 (0.8-3.2)	2.2 (1.0-4.0)	0.0633
Appreciation of life	3.1 (2.0-4.0)	3.3 (1.8-4.0)	0.4603

Data are presented as median (IQR).
[a]Wilcoxon signed rank test.
[b]The scale was scored by averaging all responses in each domain.

continuous variables. We report percentages for categorical variables and compared differences in groups using the Fisher exact test for groups with fewer than 6 observations (Table 2). We used the Wilcoxon matched-pairs signed rank test to compare differences in the rank distribution of the PTGI-X scores by participant before and after the microworkshop intervention (Table 3). $P < 0.05$ was considered statistically significant for all tests. Next, we tested the impact of the sociodemographic variables on ≥25% improvement on the PTGI-X score after attending 1 or more microretreats using univariate logistic regression. Based on the univariate findings and descriptive analyses, we constructed a multivariate logistic regression model (MLR) to predict ≥25% improvement in PTGI-X scores.

To create the MLR model, we 1st included all sociodemographic variables in an MLR model (Table 4). Next, we removed variables with low effect size and nonsignificant adjusted odds ratios (aORs). The final model had variables with high effect sizes, statistical significance, and the highest overall explanatory power as measured by the C-statistic (area under the receiver operator characteristics curve [AUC]). We confirmed the goodness of fit (GOF) for all logistic models using the Hosmer-Lemeshow GOF test at $P > 0.05$. The final multivariate model measured the interaction between providing direct patient care (no [0] vs yes [1]) and the number of microretreats attended (1, 2, or 3). We compared the odds ratios (ORs), P values, AUCs, and GOF tests for 3 models (Table 4) before selecting the final model. This final model was compared with the number of workshops attended alone and direct patient care.

Results

Participant Characteristics

A total of 163 registrants completed at least baseline data and were included in the final sample. Of these, 60 nurse participants attended at least 1 of the 3 microretreats. Eighteen participants attended any 1 of the 3 microretreats, 20 attended 2 microretreats, and 22 attended all 3 microretreats. Average attendance was 12 participants per microretreat. Twenty-three states were represented. Additional participant characteristics are reported in Table 2.

Table 4. Multivariate Models of PTG Score Improvement With Performance Characteristics[a]

	aOR	P	AUC	AIC	Hosmer-Lemeshow Goodness-of-Fit Test
Final model					
Direct patient care[b] × microretreat attendance[c]	2.7	0.010	78.1%	0.925	0.6180
2-Variable model					
Direct patient care[b]	8.3	0.061	77.7%	0.985	0.1366
Microretreat attendance[c]	2.7	0.095			
Models without interaction					
Microretreat attendance[b]	2.5	0.098	65.7%	1.050	0.1364
Direct patient care[c]	7.6	0.065	67.9%	1.014	N/A

Abbreviation: AIC, Akaike information criterion.
[a]Based on PTGI-X posttest score changes ≥25%.
[b]Yes/no.
[c]Attendance at 1, 2, or 3 microretreats.

Microretreat Responses

Participant-identified barriers to attendance included concomitant work and personal demands (n = 26; 65%) and time-of-day conflicts (n = 9; 22.5%). Only 5% (n = 2) cited loss of interest as a reason for attrition. Participants shared mixed feelings regarding the use of a Zoom platform, noting both the technology and "Zoom fatigue" as tradeoffs for "The opportunity to interact with others on the same journey. I was amazed at how many 'old friends' I met during the 3 sessions." Using a Likert-type scale of 1, "strongly agree," to 5, "strongly disagree," 88% (n = 56) reported that they agreed or strongly agreed with the statement "I intend to practice the skills learned in these workshops."

PTG Scores

There was no statistically significant difference in participant versus nonparticipant PTG overall scores at baseline (P = 0.4794, Table 2). There was a statistically significant improvement in overall median PTGI-X score, which improved from 2.4 to 2.6 (P = 0.0362). There was also improvement in 3 of 5 PTGI-X domains: relating to others, new possibilities, and personal strength. The greatest improvement was in the relating to others domain. It increased postintervention, from a median of 2.1 to 2.4 (1.4-3.1 to 1.6-3.4 pre-post IQR; P = 0.0267). Next, the new possibilities domain increased, with a pre-post median of 2.2 (1.2-3.4 to 1.6-3.8 pre-post IQR; P = 0.0381). Finally, the personal strength domain increased, with a pre-post median of 2.8 (1.3-3.8 to 2-4 pre-post IQR; P = 0.0121). There was a decrease in the median score for spiritual and existential change (from 3.2 to 2.2), although the overall IQR increased from 0.8-3.2 to 1.0-4.0. Notably, the highest PTG baseline domain IQR was appreciation for life. This high domain at baseline did not statistically improve after intervention (pre, 3.125 [2-4]; post, 3.25 [1.8-4.0]).

PTG Improvement

Having direct patient care responsibilities and increased workshop attendance increased the likelihood of PTG improvement ≥25% in the final multivariate model with a high overall model performance of 78.1%. Many individual participant characteristics demonstrated high effect sizes for increasing PTG (eg, high ORs with relevance for practice). In the univariate analysis, the strongest predictor of increased PTG among participants was for nurses providing direct patient care (OR, 7.6; P = 0.065) and those earlier in their career (OR, 5.0 for 0-10 years in practice; P = 0.163). As nurses attended more microretreats, their PTG increased 2.5-fold for each additional workshop attended (P = 0.098) (Table 3). Previous experience with a contemplative practice also increased the effect size of PTG improvement (OR, 1.7; P = 0.452).

In the final multivariate model predicting PTG, there was synergistic interaction between providing direct patient care and increasing workshop attendance (aOR, 2.7; P = 0.010). These 2 variables alone performed profoundly well at predicting PTG (AUC, 78.1%; Table 4). In comparison, the number of workshops attended (1, 2, or 3) had a high effect size of 2.5. However, it was less predictive overall (AUC, 65.7%) and not significant (P = 0.098). Direct patient care alone also had a high effect size of 7.7 but was less predictive of PTG overall (AUC, 68.0) and not significant (P = 0.065).

Discussion

The aim of this study was to understand the impact of a contemplative microretreat workshop series on PTG. Attendance at the microretreats improved overall PTG scores. The greatest improvement was in the relating to others domain (IQR increased from 1.4-3.1 to 1.6-3.4, P = 0.0267), followed by new possibilities (IQR increased from 1.2-3.4 to 1.6-3.8; P = 0.038) and personal strength (IQR increased from 1.3-3.8 to 2-4; P = 0.0121). Most notably, this contemplative intervention to improve PTG was most powerful for nurses in direct patient care and for those who attended more retreats (OR, 2.7; P = 0.010). This model measuring the interaction between direct patient care (no vs yes) and the number of microretreats attended (1, 2, or 3) was powerfully predictive of growth (AUC, 78.1%). Anecdotally, participants reported the experience as meaningful, as it included tangible, actionable practices to decrease sensations of stress and overwhelm. Results of this study support the use of contemplative interventions to promote PTG, particularly among early career nurses in direct patient care.

This study did not evaluate the intervention's cost implications for healthcare leaders and therefore cannot assume return on investment predictions. However, Muir and colleagues' 2022 Markov model structure comparing nurse burnout–attributed turnover costs found that the hospital cost burden of "status quo" burnout among nurses new to a hospital is higher compared with RNs in a hospital system, with a focus on burnout reduction, such as well-being programs, even including the cost of such programs.[40] It has also been shown that interventions such as this one can be staffed with local hospital personnel, thus alleviating consultant or contracting fees from outside well-being experts.[31] Keeping the leaders of this work

internal to organizations fosters inherent trust and continuity between participants and leaders, which rarely exists between consultants and participants.

This intervention was conducted during the 2nd COVID-19 wave in the United States during the winter months of 2020. Contextualizing self-reported growth is imperative to honor the participants' experiences in recognizing their challenges during the surge. Co-occurring personal protective equipment shortages, new availability of vaccines, and the approaching 1-year anniversary of the start of the pandemic may all be mediating factors. Despite these variables, it is crucial to note the participants' highly rated preintervention appreciation for life and reported decrease in spiritual and existential growth.

Strengths and Limitations

The design of this study has strengths and limitations. This is the 1st known study to describe the effects of an intervention for nurses directly aimed at fostering intrapandemic PTG. There is substantial national and global attention on nurses coping with interpandemic and postpandemic effects on well-being; health systems leaders must shoulder accountability for systemic change with innovative strategies, rather than burdening individual self-care.[40] Future research should investigate the cost-benefit ratio of sponsoring programs for nurses and provision of time away from work to complete in comparison with nurse turnover costs. Further study is also needed to better understand the relationship between the contemplative practices and specific positive changes after trauma, and longitudinal changes over time.

Additional studies may consider randomizing participants, studying the longitudinal impact of contemplative microretreats on PTGI-X scores over time, measuring the dose-response relationship between the number of microretreats attended and PTGI-X scores, testing various microretreat themes to measure microretreat content on PTGI-X scores, and studying larger numbers of participants. These approaches could increase generalizability and reduce possible bias from self-reporting and self-selection. Despite these limitations, this study presents hypothesis-generating results that can inform the design of future larger interventional studies examining an array of PTG-informed well-being interventions to increase healthcare's response to the crisis impacting nurses worldwide. This study is meaningful in that it offered a novel, clinically relevant, evidence-based practice intervention to address a global challenge in healthcare.

Conclusion

The ability to *grow* in the face of adversity is fundamentally critical for the personal well-being and career longevity of nurses and all healthcare workers. It is necessary to strengthen psychological support of nurses to improve PTG. Contemplative interventions such as this that target peer support and active coping by guiding deliberate reflection may be a useful approach for nurse leaders in managing the consequences of the ongoing pandemic among their teams.

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