Original Article

Effectiveness of Lovingkindness Micro-Practices on Chronic Pain and Stress Outcomes in Nurses: An Online, Double-blind, Randomized-Controlled Pilot Study

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Abstract

Background: Nursing professionals relentlessly promote health around the world but do not utilize self-care themselves, leaving them to experience chronic pain and stress, which impacts their personal and professional lives. Nurses report a lack of time to practice consistent self-care; however, micro-practices performed throughout the day were statistically significant between pre and post for chronic pain, stress, self-compassion, care-providing, and pulse rate.

Aim: To evaluate the feasibility and acceptability of conducting a study on the effectiveness of loving kindness micro practices compared to an active-controlled group on outcomes of chronic pain, stress, pulse rate, analgesic intake, self-compassion, professional caring, as-needed over-the-counter pain medication, and serum cortisol among nurses.

Methods: Asynchronized, three-week, online, double-blind, randomized controlled pilot study with 40 United States nurses based on theories of Watson's Caring Science, Neff's Self-Compassion, Positive Psychology, Donabedian's Model, Adult Education, and Neuroplasticity.

Results: Results from the analysis of covariance suggested that there were not statistically significant differences between groups; however, self-reports noted improvements in pain, anxiety, sleep, and stress reduction. Paired samples t-tests showed a mean difference that were statistically significant difference between pre-and post-intervention means: chronic pain ($p = .002$), stress ($p < .001$),), self-compassion ($p < .001$), care-providing ($p = 0.19$), pulse rate ($p = .003$). The mean differences between pre and post-measures of cortisol ($p = .058$) and as-needed medications ($p = .693$) were not statistically significant.

Conclusions: Results suggest conducting this complex study online was feasible and acceptable to nurses, inviting further exploration into loving-kindness micro-practices to help chronic pain and stress outcomes for nurses.

Keywords: serum cortisol, stress, chronic pain, micro-practices, loving-kindness, nurses.

Background

A nurse's greatest gift to their patients is their healing presence (Watson & Woodward, 2010). However, nurses cannot provide competent patient care when they experience extreme workloads, which can cause high professional stress and pain, as seen during the Coronavirus 2019 (COVID-19) pandemic (LeClaire et al., 2022). During the COVID-19 pandemic, nurses continued to care for their patients, families, and colleagues in the face of an unprecedented toll on their health (Sitzman & Craven, 2021).

Furthermore, the COVID-19 pandemic and its variants still impact healthcare (Taylor-Clark et al., 2022).

These new impact factors faced by nurses post-COVID-19 highlighted the pre-existing stress and pain that nurses experience on an average day. Chronic low back pain among nurses was discovered to affect their ability to provide quality care (Budhrani-Shani et al., 2016). Additional stress and pain affect nurses' ability to provide competent care (Eccleston et al., 2020; Richardson et al., 2018; Sitzman & Craven, 2021). As there are few studies on the effects of chronic pain on nurses' personal and professional lives, a university-approved pilot study to evaluate the impact of this topic was conducted (Valluri et al., 2022). Feedback gathered from a sample of 423 nurses from five countries stated that chronic pain (CP) and stress affected nurses profoundly, but they lacked the time and financial resources to practice daily self-care (Valluri et al., 2023). In response to that survey, this pilot study was conducted. INDIRA study is a name for the three-week online, double-blind, randomized-controlled study to determine the effectiveness of loving kindness-based meditation-based micro-practices, compared to an attention-controlled group on nurses' CP outcomes of pain, stress, self-compassion, professional caring, pulse rate, analgesic intake, and cortisol. These CP outcomes will henceforth be known as the study's outcomes, and it is important to address these outcomes early to prevent them from becoming neurological diseases of their own (Fine, 2011).

The outcomes of this study are reflected by the Bureau of Labor Statistics (Bureau of Labor Statistics, 2020), which reports the rate of musculoskeletal injury to nurses increased to 290.8% during COVID-19. Globally, nurses dealing with these unprecedented patient loads experience emotional challenges, increased stress, biorhythmic disturbances, disruption in social support, exhaustion, and a sense of failure (Sasidharan & Dhillon, 2021). These factors contribute to an estimated attrition rate of 40% to 49% among nurses in the next few years (LeClaire et al., 2022; Taylor-Clark et al.,

2022). The loss of nurses is costly. An average hospital in the United States spends approximately $36,567 to $40,038 to replace one nurse, but the intangible costs of burnout, hopelessness, dissatisfaction, lack of self-esteem, loss of control, and suicide in the nursing profession are immeasurable (Alderson et al., 2015; Colosi, 2021; Hooley et al., 2014; Karhula et al., 2016).

The injuries during a pandemic or working short-staffed can cause nurses to experience CP. People who experience CP take medication to help reduce pain. In addition to medication, a multi-disciplinary approach, including meditation-based interventions (MBI), has been shown to increase well-being and reduce the effects of musculoskeletal pain and stress (Baer, 2014; Bernal et al., 2015; Bonzini et al., 2015; Lomas et al., 2015). To help people with chronic pain, Dr. Kabat-Zinn created an MBI called Mindfulness-Based Stress Reduction (MBSR), which teaches people to use their breath meditation to attenuate pain signals and help manage pain, stress and anxiety (Kabat-Zinn et al., 1986). Although MBSR is the most widely studied MBI, other global MBIs report similar positive effects (Valluri et al., 2024). Regular MBI practices can be a "protective armor" against pain outcomes (Penson et al., 2000, p. 427). A popular MBI in the East is called loving-kindness meditation (LKM) and has been shown to reduce stress effectively and CP (Zeng et al., 2015). The LKM teaches students to take action to relieve their suffering through self-compassion, and is free to learn, and is easy to practice (Boellinghaus et al., 2014; Carvalho et al., 2018; Dalai Lama & Ekman, 2008). Even brief MBIs can affect a person's well-being (Lam et al., 2015; van Agteren et al., 2021). The first of the 10 Caritas Processes ® created by Dr. Jean Watson encourages nurses to practice loving-kindness, compassion, and equanimity towards self and others.

Theoretical support

Watson's Caring Science (WCS): The primary support is based on the ten Caritas Processes® where loving actions enhance self-care through micro-practices (Nelson & Watson, 2011). Over

300 magnet hospitals use these Caritas Processes® to provide effective care, and their impact has been confirmed by several systematic reviews (Carvalho et al., 2011; Romero-Martín et al., 2019; Wei & Watson, 2019).

Donabedian's theory of quality care three-step processes supported successfully distributing an online electronic education module (Tossaint-Schoenmakers et al., 2021).

Positive Psychology and ***Self-Compassion theory*** supported the focus on enhancing compassionate, consistent practices and the focus on positive aspects of nurses' lives even in unpleasant circumstances such as chronic pain and stress (Neff, 2003; 2020; Seligman, 1998).

Adult Education supported the flexibility of an asynchronized module and could be readily utilized at a time and place of nurses' choosing (DeCelle, 2016; Knowles, 1973).

The theory of neuroplasticity supports the regular use of micro-practices to help the participants' brains to adapt, remodel, and reorganize under repeated brief or long-term meditative practices (Tang et al., 2015; Zeidan & Vago, 2016; Zeidan et al., 2011, 2012, 2016; Zorn et al., 2020). These theories supported all aspects of this study aimed to evaluate the feasibility and acceptability of conducting the INDIRA study as an asynchronized, online study to fill a gap in current literature on the effectiveness of loving micro-practices to manage the study's outcomes.

Methods

The study was undertaken based on The Collaborative Institutional Training Initiative (CITI) guidelines. After securing Institution Review Board (IRB) approval, the study was conducted for three weeks between August 2022 and September 2022. All data, such as the weekly interventions, daily participation surveys, and pre-post survey responses, were disseminated and stored in REDCap. The gathered data was calculated using the Statistical Package for the Social Sciences version 29 (SPSS). The pre-and post-serum cortisol results were checked via home kits bought from Lets-Get-Checked. A sample of 40 nurses were recruited through Facebook, Twitter, and email contacts. Nurses interested in the study clicked a link that redirected them to a detailed information page on a secure CITI and IRB-approved research site called Research Electronic Data Capture (REDCap) (Santacroce et al., 2004). Nurses were encouraged to pass the link to their peers, thus fulfilling the Internet snowball convenience sampling requirements (Kosinski et al., 2015).

Inclusion criteria: The inclusion criteria were 18 years or older, current or past registrants with a state board of nursing in the United States; had access to the Internet; could read English; could commit to daily self-care micro-practice; keep a daily participation survey; and provide a mailing address where Lets-Get-Checked home serum tests could be mailed.

Exclusion criteria: The exclusion criteria were nurses who were pregnant, had a diagnosis of Cushing's disease, were actively taking steroids, or practiced meditation regularly, as these factors directly affect the production and reading of cortisol levels (Granger et al., 2009; Out et al., 2013).

Sample: A sample size of participants was based on a meta-analysis of MBI RCTs, where sample sizes ranged from 15 to 100 (Hilton et al., 2017; van der Reit et al., 2018). Accounting for attrition rates for MBIs from 5% to 24% (Hurley et al., 2014), a total sample size of 40 was selected (Table 1), providing equal samples for LKM (n=20) and ACG (n=20) within the mainland of the United States.

Instruments

Demographic data was collected with a 10-item questionnaire to determine age, gender, ethnicity, employment setting, years of education, service, self-reported pain, number of children, frequency of over-the-counter analgesics, and prescription medication usage.

The Numeric Pain Rating Scale (NPRS) collected subjective information from nurses on an 11-point scale, with 0 indicating no pain and 10 indicating the worst imaginable pain (Alghadir et al., 2018). In a synthesis of 43 studies, NPRS provided reliable pain scores in most studies (Modarresi et al., 2021).

Table 1 Participants Flow Chart

Number of Participants
Recruited (*n* = 80)
Signed informed consent (*n* =54)
Provided mailing address (*n* = 40)
Randomized into LKM or ACG groups (*n* = 40)
Completed pre-study surveys (*n* = 36)
Completed post-study surveys (*n* = 29)

Note. This table presents the number of participants (n) at each pilot study stage with two groups: the loving-kindness meditation group (LKM) and the active control group (ACG).

The Perceived Stress Scale-10 (PSS-10) uses a four-point scale (0 = never, 1 = almost never, 2 = sometimes, 3 = fairly often, or 4 = very often) to indicate perceived stress intensity levels (Cohen et al., 1988). This instrument has been successfully used to check stress levels in MBIs in several studies, reviews, systematic reviews, and meta-analyses (Atanes et al., 2015; Coster et al., 2020; Mahon et al., 2017; Pardos-Gascón et al., 2021). Internal consistency of PSS on Cronbach's alpha (α) is .82–.91, and in 19 studies (Lee, 2012), test-retest reliability varied for two days (r = .85), one week (r = .74), two weeks (r = .77), and six weeks (r = .55) in 19 studies (n = 8702).

The Caring Factor Survey–Care Provider Version (CFS-CPV) scale was developed to reflect the practices of the ten Caritas Factors and uses a 10-item survey measuring professional caring on a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree) (Nelson et al., 2016). Reliability using Cronbach's alpha (α) is 0.95, internal consistency for items = 0.867, and content validity index ranges between 0.78 and 0.90 with item-total correlations of r < 0.3 (Vrbnjak et al., 2017). Additionally, a survey of 91 nurses using Slovene translation of CSF-CPV was understood by nurses, providing a content validity of 0.990 (Vrbnjak et al., 2017).

The *Self-Compassion Scale–Short Form (SCS-SF),* a 12-item survey for self-compassion, has been used successfully to collect data in several MBIs (Neff, 2003: Costa & Pinto-Gouveia, 2011; Coster et al., 2020; Lopes et al., 2019). This survey has an internal consistency of Cronbach's alpha (α) between .86–.92 and Pearson's correlation with PSS-14

at r ≥ 0.97; test-retest reliability for one and three weeks was .93 in clinical and non-clinical samples (Raes et al., 2011). Concurrent validity with PSS-14 was p < .001 (Hayes et al., 2016).

Serum Cortisol Levels: *The t*est collects data on the hypothalamic-pituitary-adrenal axis activation that is triggered due to acute stress or CP (Abdallah & Geha, 2017; Tennant, 2013). The effects of MBIs on cortisol have been captured through many studies with reference values from 7–25 mcg/dL in the morning and 2–14 mcg/dL in the afternoon (Atanes et al., 2015; Out et al., 2013; Walvekar et al., 2015).

Pulse Rate: Peripheral pulse rate is a marker of an autonomic nervous system pain assessment, easy to measure and non-invasive, and accurately measures low, moderate, and severe pain-intensity levels (Cowen et al., 2015).

Pain Medication Intake: Taking over-the-counter or prescribed pain medications to help nurses cope with CP (Crisp et al., 2021; Gatchel, 2005). Meditation-based interventions lead to positive changes in neurology that affect the pain experiences and pain-coping strategies, including reduced intake of analgesics (Korn, 2016; Anderson et al., 2017; Nicklas et al., 2010). The time requirement to complete all these instruments was less than 10 minutes.

Loving Kindness Meditation (LKM): The intervention group (LKM) was encouraged to prioritize compassionate self-care during this intervention (Griffin et al., 2021). During week one, on the first day, the nurses were asked to listen to a guided seven-minute meditation called Caring Moment by Dr. Jean Watson (Watson, 2012a, 2012b). On subsequent days, nurses could either listen to the same guided meditation or 15 minutes of soothing music

created by Jason Barrette for this study. The micro-practices for week one were Serenity Pause® (Taylor, 2012); week two, three mindful breaths (Sitzman & Craven, 2021), and in week three, they practiced supportive touch (Neff, 2018a, 2018b). Nurses were asked to perform these micro-practices as often as possible with their whole heart, gut, brain, and mind.

Active Control Group (ACG): The ACG listened to a 15-minute TED talk once a week and practiced self-care, as suggested in those lectures. During the first week, nurses watched a tribute to nurses by Carolyn Jones (2016) and were asked to note at least three times during the day when a patient expressed appreciation for them. During week two, nurses watched Thriving Under Pressure by Andrea DiNardo (2018) and noted at least three times a day how they met a challenge and became comfortable with discomfort, still achieving their nursing goals. For week three, nurses watched "Want to Get Great at Something? Get a Coach" by Dr. Atul Gawande (2017). Nurses were asked to note areas they naturally excelled in and seek coaching to reach a higher level in those skills. Both LKM and ACG groups were asked to keep and submit daily logs of micro-practices, pain

levels, pulse levels, and PRN medication intake through REDCap, thus providing reliable data on intervention fidelity (Eaton et al., 2011; Santacroce et al., 2004; Ybarra & Eaton, 2005). ***Statistical Analysis*:** Data were downloaded from REDCap and analyzed in SPSS utilizing paired sample t-tests and ANCOVA, with an alpha criterion of 0.05. The importance of taking each instrument's role and value was shared with the nurses at intake to avoid missing values (Fink, 2015). All electronic correspondences from nurses reporting how the study was helping them were read, analyzed, and reported.

Results

The intervention was distributed electronically as planned. The attrition rate was 20%. The daily reports showed that they engaged in micro-practices at least once every four to six hours. All measures except cortisol results were submitted on time. Two nurses were unable to provide the required amount of blood for tests. There were no complaints about group assignments or the micro-practices. The 40 nurses completed the demographic survey (Table 2).

Table 2 Demographic Survey

Variables	Counts and Percentages
Age	18 to 23 (1, 2.8%), 24 to 28 (3, 8.3%), 29 to 33 (0, 0.0%), 34 to 38 (6, 16.7%), 39 to 43 (2, 5.6%), 44 to 48 (6, 16.7%), 49 to 53 (8, 22.2%), 54 to 58 (2, 5.6%), 59 to 63 (6, 16.7%), 64 to 68 (0, 0.0%), 69 to 73 (2, 5.6%), 74 to 78 (0, 0.0%).
Gender	Woman (34, 94.4%), Man (1, 2.8%), Nonbinary (1, 2.8%).
Registration	Advanced Practice Registered Nurse (5, 13.9%), Registered Nurse (29, 80.6%), Licensed Practical Nurse (2, 5.6%).
State	Arizona (1, 2.8%), Colorado (1, 2.8%), Florida (1, 2.8%), Georgia (2, 5.6%), Kansas (9, 25.0%), Mississippi (1, 2.8%), Missouri (13, 36.1%), New Hampshire (3, 8.3%), New York (1, 2.8%), South Dakota (2, 5.6%), Washington (1, 2.8%), Wisconsin (1, 2.8%).
Employment	Employed full time (32, 88.9%), Employed part-time (2, 5.6%), Full time Student (2, 5.6%)
Years in nursing	less than 5 years, (7, 19.4%), 6 to 10 years (3, 8.3%), 11 to 15 years (8, 22.2%), 16 to 20 years (5, 13.9%), 21 to 25 years (2, 5.6%), 25 to 30 years (3, 8.3%), 30 to 34 years (1, 2.8%), 35 to 39 years (4, 11.1%), Over 40 years (3, 8.3%)
Primary function	Direct patient care (22, 61.1%), Indirect patient care (6, 16.7%), Nursing Educator (8, 22.2%).
Duration of chronic pain	3 months to 5 years (17, 47.2%), 6 to 10 years (14, 38.9%), 11 to 15 years (2, 5.6%), 16 to 20 years (1, 2.8%), 25 to 30 years (2, 5.6%).
Daily chronic pain	Disagree (1, 2.8%), Slightly agree (6, 16.7%), Agree (21, 58.3%), Strongly agree (8, 22.2%).
PRN OTC meds to manage chronic pain	Strongly disagree (1, 2.8%), Disagree (3, 8.3%), Slightly disagree (2, 5.6%), Neutral (2, 5.6%), Slightly agree (7, 19.4%), Agree (11, 30.6%), Strongly agree (10, 27.8%).

Note. This table presents the number of participants and percentages for each variable in the demographic survey.

Table 3 ANCOVA Output

Dependent Variable	F	*p*	η^2
Post-NPS	0.063	.803	.003
Post-PSS	2.166	.154	.083
Post-SCS	.414	.526	.016
Post-CFS-CPV	.203	.656	.008
Post-Cortisol	.011	.917	.001

Note. F= Critical value. p = Significance value. η^2 = Eta Squared. Post-NPS = Numerical Pain Scale. Post-PSS = Perceived Stress Scale. Post-SCS = Self-Compassion Scale. Post-CFS-CPV = Caring Factor Survey–Care Provider Version. Post-Cortisol = Post-study cortisol results.

Table 4 OLR for Post-Pulse and Post-PRN Results

Dependent Variable	R^2_N	X^2	df	*P*
Post-Pulse	.0805	4.29	2	.117
Post-PRN	0.0215	1.27	2	0.529

Note. Post-Pulse = Post-study pulse rate. R2N = Nagelkerke R Squared. Df = Degrees of freedom. *p* = Significance value. The dependent variable "Pulse–last" has the following order: 50 to 60 beats per minute | 60 to 70 beats per minute | 70 to 80 beats per minute | Over 80 beats per minute.   Post-PRN = As-needed over-the-counter pain medication. Dependent variable "post-PRN" has the following order: Never | Rarely | Sometimes | Often | Always.

After adjustment for pre-NPS, the ANCOVA model showed no statistically significant difference in post-NPS, post-PSS, post-SCS, post-CFS-CPV, or post-serum cortisol levels (Table 3). The post-intervention categorical variables were analyzed using ordinal logistic regression (OLR). Specifically, post-PRN was modeled as an outcome of pre-NPS and binary intervention indicator (0 = ACG, 1 = LKM). Results indicated that the combined predictors did not significantly predict the post-intervention OTC PRN medication intake or pulse rate (Table 4). Based on these results, we retain the null hypothesis that there was no significant difference in the chronic pain outcomes between the LKM and ACG. However, positive self-reports from the first week to a month post-study encourage further exploration of the utility of these micro-practices-based interventions.

Discussion

This intervention was carried out in 2022, when the effects of COVID-19 were still reverberating throughout the nursing community. Increased workload, shortage of staffing, and high acuity of patients led to increased injury, pain, and stress for nurses, and the injury rate for nurses increased by 290.8% (Eccleston et al., 2020; Shechter et al., 2020). Although the analysis of covariance (ANCOVA) and ordinal Logistic Regression (OLR) did not show significantly significant differences between groups, results did show positive effects based on the following excerpts from nurses' self-reports, which indicated that these practices were making a difference in many of the study outcomes on chronic pain, stress, and serum cortisol. Even nurses stated, "I actually found it very useful, and I was initially highly skeptical." Another nurse said that she

had suffered from anxiety since she was young. However, she reported that these brief micro-practices and guided meditations improved her "overall mental health" and helped her deal with the "chaos" of being a busy mom and a full-time final semester Family Nurse Practitioner student. She noted, "the tough moments are a bit easier to manage with forcing myself to slow down, deep breathe, be present in each moment and remind myself that I am exactly where I am supposed to be." A nurse who had sustained a spinal injury in a car accident earlier in the year and had worked long shifts for 12 days in a row said that her "pain and stress level has been better than expected, given all that's been on my plate." Another nurse who had no interest in meditation practice before participating in this study noted the micro-practices helped her so much that she will continue using the practices as "they do relax me."

These practices seemed to lower cortisol for some nurses. One marked that her cortisol levels were reduced by more than half. Another described the results of their cortisol in this way: "….results were normal, and I attribute it to the meditation and self-care micro-practices." A nurse summed up the takeaway of these beneficial practices for nurses. "Just pausing and engaging in lovingkindness meditations and gratitude through breath work, amid our hurried and harried moments, offers a choice point and mindful awareness of the present moment." This nurse probably created space for her healing environment (Norman et al., 2016). We received no self-reports on the reduction of analgesic or professional care.

These results align with neuroscience studies that find MBI therapies positively affect CP and stress due to changes in the brain that can be measured by fMRIs, and corresponding results can be seen on assessments, including cortisol levels (Timmers et al., 2019). Nurses who reported that their cortisol dropped by more than half or stayed the same even during "very hectic schedules" are in sync with a systematic review of 20 studies (McClintock et al., 2019). There were no reports of a reduction in analgesic or pulse rates.

Nurses report leaving the profession due to inadequate pain relief (Valluri et al., 2023). Zorn et al. (2020) report that disciplined and sustained effort needs to be made to reduce the intensity of pain, and as the INDIRA study did not prescribe the number of minutes per day required to practice micro-practices, the effect of MBIs might not have been strong enough to reduce analgesic intake. However, the reduced cortisol self-reports also matched a descriptive, non-experimental design study with 21 nurses (Nelson, 2015), which found that cortisol markers decreased after consistent self-care for seven days, and professional caring and self-compassion scores increased. In a similar face-to-face study on nurses' chronic pain, Lopes et al. (2019) found that with MBIs, there was a reduction in painful symptoms and improved quality of life. Self-compassion theory strongly advocates nurses practice self-care to provide competent and compassionate care (Neff et al., 2020). For busy nurses to whom mediation was a new self-care tool can gather support for their well-being goals by practicing several meditative micro-practices (Griffin et al., 2021) or short guided meditations (Sitzman & Craven, 2021) or long periods of consistent prescribed practices (Avvenuti et al., 2020). Daily participation data indicated that this study's aim was met, as the nurses reported that both LKM and ACG were acceptable. Based on the feasibility, acceptability, and the above self-reports, it would be worthwhile to duplicate the INDIRA study with a larger known sample and provide an opportunity to share qualitative information to help improve nurses' chronic pain and stress-related outcomes and improve their self-caring abilities.

Limitations: As this was a national study, the double-blind procedure made it difficult for the investigators to contact the nurses who did not respond to email outreach. Conducting a single-blind study in a hospital setting with a known sample of nurses could provide ease of communication and promptly resolve any issues that might be encountered. Using the serum kits by LetsGetChecked was trouble-free for researchers and participants. The difficulties arose for nurses who lived in towns with slow

mail services, resulting in some samples being hydrolyzed. Having an onsite lab would eliminate this problem. We did not prescribe a specific number of times for micro-practices. Providing guidelines to practice interventions once every hour or 12 times daily would have provided uniformity and perhaps affected the results.

Conclusion: This is the first synchronized, randomized, double-blind, online study that used an at-home test kit to evaluate micro-practices' effectiveness with a sample of nurses' chronic pain outcomes. Even as nurses were reeling from the effects of COVID-19, the study was feasible to implement, and nurses were responsive to their weekly interventions. The time and effort required to participate in the study were acceptable based on the attrition rate. Although analyses found no differences in the post-intervention means of the groups' positive feedback from nurses, something caused a difference, per self-reports, inviting further in-depth exploration with a known sample. The studies on Caritas-based micro-practices are critical now, as the attrition rate among nurses is trending higher even before the Coronavirus 2019 pandemic. Nursing attrition can lead to intangible loss of nursing talent and tangible costs to hospital systems. If nurses neglect self-care, they could become patients needing more specialized care later. However, using self-care activities like the ones from the INDIRA study, nurses can potentially improve their chronic pain and stress outcomes in the short term. The long-term effects of the LKM intervention could impact nurses' well-being, caregiving abilities, job satisfaction, cost savings, patient satisfaction, and, ultimately, retention of their talents and passion. According to Dr. Watson, lovingkindness micro-practices could have a loving holographic effect on nurses and the entire healthcare system.

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