

Gratitude exercise and well-being in relation to spirituality: A mixed-method study

Supriya Srivastava · Naved Iqbal

Abstract: Previous studies have shown inconsistent results regarding the effectiveness of gratitude exercises on well-being. Several researchers suggested this inconsistency could be due to the frequency of performing the exercise, the type of comparison group used in the study, and due to the presence of some moderators like positive affect, trait gratitude, spirituality, religiosity, etc. Out of these variables, the present study tried to examine the role of spirituality. The present investigation experimentally studied the effect of a 4-week gratitude exercise on the well-being of a sample of working Indian adults while examining spirituality as a moderator. Participants were randomly allotted to the gratitude exercise group and control group, consisting of 60 participants in each group (N = 120). The present study employed a sequential explanatory mixed method. The quantitative results were analyzed using a mixed-design ANOVA. The results found a significant increase in gratitude, satisfaction with life, and positive affect and a significant decrease in the negative affect of participants in the gratitude group at post-exercise and follow-up compared to the control group. Spirituality was found to be a significant moderator as participants with high levels of spirituality benefited the most from the gratitude exercise. For the qualitative part, an interpretative phenomenological analysis was used. Three themes: Experience of performing the gratitude exercise, gratitude expressed towards and, benefits of the exercise were identified which were further categorized under several subthemes. Mixing of the study was done at the interpretation level where qualitative data was used to contextualize the quantitative findings.

Keywords: Gratitude; well-being; spirituality; mixed-method; working Indian adults

1. Introduction

Gratitude can be defined as the appreciation of what is useful and meaningful to oneself; or a general state of thankfulness and/or appreciation (Sansone & Sansone, 2010). Gratitude can also be characterized as an attitude of valuing life as a gift, as well as a moral affect that arises from and inspires behavior motivated by a care for the well-being of others (McCullough et al., 2001). Gratitude can be felt and expressed in a variety of ways. Individuals can successfully cultivate this trait through a variety of interventions and strategies.

The first empirical study to foster gratitude in individuals was conducted by Emmons and McCullough (2003). Using the gratitude list exercise, they explored the impact of a gratitude intervention on physical, psychological, and subjective well-being. Since then, several studies have shown the effectiveness of gratitude exercises in improved overall well-being (Froh et al., 2009; Wood et al., 2008; Chan, 2010; Kerr et al., 2015; Manthey et al., 2016; Seligman et al., 2005).

Well-being can be defined as the study of wellness, happiness, and a life worth living, as opposed to disorder (Bradburn, 1969). However, as the study of well-being has evolved, many researchers have come to distinguish between two distinct conceptualizations of well-being, subjective well-being, and psychological well-being. The research frequently describes Mechanisms Linking Gratitude to Subjective Well-Being (SWB) as a category with both cognitive and emotive components (Diener et al., 1999). Subjective well-being is defined as an individual's internal experience of happiness and is comprised of three dimensions including positive affect, negative affect, and life satisfaction (Ryff & Keyes, 1995).

There is evidence that gratitude-focused interventions can boost happiness. However, research on the efficacy of these interventions has yielded mixed results so far. There have been many studies that found positive results of gratitude exercises on well-being (eg., Froh et al., 2009; Wood et al., 2008; Chan, 2010; Kerr et al., 2015; Manthey et al., 2016; Seligman et al., 2005). However contradictory to these findings, some studies did not confirm the positive associations between gratitude exercise and well-being (e.g., Gurel, 2008; Henrie, 2007; Kashdan et al., 2006; Ozimkowski, 2008).

Several researchers suggested this inconsistency in findings could be due to the presence of some moderators for example humility (Watkins, 2014), personality variables such as extraversion (Froh et al., 2009), age (Froh et al., 2009; Watkins, 2014), spirituality, and religiosity (Froh et al., 2009; Watkins, 2014). Some other factors like the type of control groups used for comparisons could also influence the outcome as several scholars have warned that comparing the effectiveness of a negative intervention, such as the Hassles group, can be of risk (Davis et al., 2016; Wood et al., 2010). Other factors like the frequency of performing the gratitude exercises, and cultural and attitudinal influences can also affect the overall results (Boehm et al., 2011; Lyubomirsky et al., 2011).

Some moderators have already been studied for example, positive affect (Froh et al. 2009), trait gratitude (Rash et al. 2011), and self-esteem (Iqbal & Dar, 2022) have been found to moderate the effects of the gratitude exercise on well-being. However, some other moderators have not yet been studied, one of them is spirituality, therefore present study was conducted to study the role of spirituality as a moderator between gratitude exercise and wellbeing.

Several studies have found that gratitude is associated with higher levels of spiritual transcendence (McCullough et al., 2002; McCullough et al., 2004; Uher & Watkins, 2014) and intrinsic religiosity (McCullough et al., 2004; Tsang et al., 2012; Uher & Watkins, 2014; Watkins et al., 2003).

Although the concept of religiosity and spirituality seems to be similar yet the two have been distinguished by several authors. Religiosity is frequently viewed as "the formal, institutional, and outward expression" (Cotton et al., 2006) of one's relationship with the sacred, and it is typically expressed as "beliefs and practices associated with a particular religious worldview and community" (Cotton et al., 2006). On the other hand, spirituality is a concept that refers to ideas and behaviors that are less formal and more experiential, individual, and personalized (Hill et al., 2000; Paukert et al., 2011). Spirituality means different things to different people. In general, it entails a sense of belonging to something larger than oneself and a quest for purpose in life. It is defined as the human desire for transcendence, introspection, interconnectedness, and the quest for meaning in life (Benson & Roehlkepartain, 2008; Worthington et al., 2011; Zinnbauer et al., 1999). A spiritual experience might be described as sacred or sublime, or simply as a strong sense of aliveness and connectivity (Egan et al., 2011). Emmons and Kneezel (2005) discovered that higher levels of extrinsic and intrinsic spirituality were linked to a higher frequency of thankful feelings each day. People who were spiritually inclined were more likely to appreciate

the positive aspects of life than those who were not.

Gratitude and spirituality may have a favorable relationship because beneficial conditions in people's lives are seen as being created by a benevolent moral agent rather than by human efforts by those who have a high level of religiosity/spirituality (for instance, God or higher positive energy). People who are less religious or spiritual, on the other hand, may attribute similar events to luck and hence be less appreciative (Watkins, 2014).

As grateful people are religious/spiritual on a variety of religious/spiritual measures, gratitude exercises could be especially useful for them. It's possible, though, that religious/spiritual persons are already grateful enough and thus have little to gain from gratitude interventions. Another intriguing possibility is that gratitude can aid spiritual growth. Gratitude may increase spirituality by improving one's ability to see meaningful relationships and, as a result, purpose in life (King et al., 2006). Watkins (2014) proposed that gratitude researchers incorporate religious and spirituality variables in their intervention studies in light of these and other findings. Considering these suggestions, the present study tried to analyze the role of spirituality as a moderator on the outcome of gratitude exercises.

In a critical review of scale development practices for 24 important measures of spirituality, Kapuscinski & Masters (2010) confirmed the continued disagreement regarding how to properly define spirituality and understand its relationship to religiousness. They concluded that while choosing a measure for use in research studies, investigators should carefully scrutinize what conceptualization of spirituality is guiding their thinking and research objectives. They strongly recommended utilizing measures of spirituality that incorporate a transcendent element as this seems vital to differentiating spirituality from other constructs and is core to many, perhaps most, understandings of spirituality. They supported the use of measurement tools that assess behavioral components of spirituality. The present study used the Daily Spiritual Experience Scale (DSES) to measure participants' spirituality. This scale is intended to measure a person's perception of the transcendent (God, the divine) in daily life and his or her perception of his or her interaction with or involvement with the transcendent in life. The items attempt to measure experience rather than particular beliefs or behaviors; therefore, they are intended to transcend the boundaries of any particular religion. The DSES was constructed to reflect an overlapping circle model of spirituality/religiousness and contains items that are more specifically theistic, as well as items to tap the spiritual experience of those who are not comfortable with theistic language (Underwood & Teresi, 2002).

Gratitude-focused interventions can improve overall well-being (eg., Froh et al., 2009; Wood et al., 2008; Chan, 2010; Kerr et al., 2015; Manthey et al., 2016; Seligman et al., 2005). However, more research is needed to see if gratitude exercises are effective in other demographics and when compared to control groups. In the past few years, several studies have been conducted that tried to apply gratitude exercises in different populations, however, the participants included in these studies were mostly healthcare professionals and teachers (Chan, 2013; Cheng et al., 2014; Cook et al., 2017).

Some studies have found gratitude among employees to be significantly positively correlated with well-being, happiness, mental health, and work-related outcomes such as job performance, organizational commitment, and citizenship behavior (Cain et al., 2018; Komase et al., 2019). A study by Garg et al. (2022), found that thankfulness significantly moderated the relationship between toxicity and psychological capital. To lessen the effects of workplace bullying and rude behavior, the study suggested institutionalizing a gratitude-based organization. It was proposed that organizations may improve their cultures by sponsoring projects for particular employees that foster happiness by increasing people's awareness of their gratitude in daily life.

Stress has touched almost all professions posing a threat to mental and physical health. India being the Information Technology (IT) hub with lakhs involved as IT Professionals, there is a need to improve the well-being of this group. Interventions to increase gratitude are relatively simple and low-cost, and with studies supporting its link with increased well-being, efforts to increase gratitude among young working IT professionals can be of great value. Therefore, the current study attempted to analyze the effectiveness of a gratitude intervention on a sample of working (IT-Professionals) Indian adults to add to international research on gratitude-based interventions in diverse cultural contexts and on a varied demographic.

Past studies in the area of gratitude interventions have mostly employed quantitative methods. Few studies have also tried to analyze it qualitatively. However, to understand the subjective experience of participants performing gratitude exercises in detail a mixed- method that combines the strengths of both quantitative and qualitative research is best suited. Therefore, the present study utilized an explanatory sequential mixed-methods study design, in which a quantitative study was followed by a qualitative study to explain the quantitative study's findings (Creswell 2003).

The study was broadly broken into two phases. Phase 1 involved the collection, analysis, and evaluation of quantitative data; phase 2 involved arranging, undertaking interviews, analyzing, and evaluating the qualitative data. The mixed method was used by administering questionnaires and semi-structured interviews as research instruments to collect quantitative and qualitative data respectively.

The main objective of the quantitative study was to see the effectiveness of gratitude exercises on the well-being and spirituality of participants at post-exercise and follow-up while examining spirituality as a moderator. The objective of the qualitative study was to explore the experience of performing gratitude exercises among participants. For the quantitative study, two hypotheses were formulated:

Hypothesis 1. Participants in the gratitude exercise group will have increased satisfaction with life compared to the control group at post-exercise and follow-up.

Hypothesis 2. Participants in the gratitude exercise group will have increased positive affect compared to the control group at post-exercise and follow-up.

Hypothesis 3. Participants in the gratitude exercise group will have a decreased negative affect compared to the control group at post-exercise and follow-up.

Hypothesis 4. Participants in the gratitude exercise group will have an increased state of gratitude compared to the control group at post-exercise and follow-up.

Hypothesis 5. Participants in the gratitude exercise group will have increased trait gratitude compared to the control group at post-exercise and follow-up.

Hypothesis 6. Participants in the gratitude exercise group will have increased spirituality compared to the control group at post-exercise and follow-up.

Hypothesis 7. Spirituality will moderate the relationship between gratitude exercise and well-being i.e., the gratitude exercise will have a greater positive impact on individuals with high spirituality than on individuals with low spirituality.

2. Quantitative study methods

2.1 Quantitative data participants

The present study required participants working in IT companies of Delhi NCR for not less than 2 years or more than 8 years of experience in positions ranging from level associate up to lead

software engineer. The present study was in offline mode and the participants were approached through business networking. Participants of the present study were 120 working adults (IT-professionals), aged 25-35 years with a mean age of 29.16 years ($SD=2.09$). There were 60 participants in the control group with a mean age of 28.98 years ($SD=1.90$) and 60 participants in the gratitude group with a mean age of 29.33 years ($SD=2.26$). The frequencies for all participants' religious affiliations were as follows: a majority of Hindus (78.3%) followed by Muslims (21.7%). Out of 120 participants, 55% were married and 45% were unmarried. All participants were Indian citizens living in Delhi-NCR.

2.2 Measures

2.2.1. Satisfaction with Life Scale (SWL)

The present study used the Satisfaction with Life Scale (SWLS) to assess participants' subjective well-being. Diener et al. (1985) developed the SWLS as a measure of life satisfaction. It's a five-item scale that assesses one's overall cognitive assessment of life satisfaction. The scale has 5 items (e.g., "In most ways, my life is close to my ideal") graded on a seven-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). Participants are asked to rate how much they agree with the statements about their lives in general. A higher score is indicative of a high level of life satisfaction. The SWLS has a coefficient alpha of .87 and a 2-month test-retest correlation coefficient of .82 (Diener et al., 1985). The SWLS is a commonly used and well-validated outcome measure in positive psychology therapies (McCullough et al., 2002; Pavot & Diener, 1993). The present study sample has Cronbach's alpha reliabilities ranging from .81 to .88.

2.2.2 Positive and Negative Affect (PANAS)

The PANAS (Watson et al., 1988) was used to assess the levels of positive and negative emotions among the participants. It is divided into two scales: the positive affect scale (PA) and the negative affect scale (NA). Each of these scales has ten emotion adjectives (e.g., interested, distressed, alert, ashamed, inspired). Participants are asked to rate how intensely they are experiencing each emotion at the time of completing the PANAS using a five-point Likert scale ranging from 1 (not at all) to 5 (extremely). By totaling up the ratings on all 10 adjectives for positive affect and negative affect, a final score for both scales is obtained. The internal consistency of the two scales has been observed to be high (Cronbach's alpha $>.85$). The scores for both scales can range from 10 to 50. A greater total positive score suggests a more positive affect. A lower total negative score suggests less negative affect. Cronbach's alpha reliabilities in this study sample varied from .90 to .94 for positive affect and .74 to .88 for negative affect.

2.2.3 Gratitude Adjectives Checklist (GAC)

The GAC (McCullough et al., 2002) was employed as a state gratitude indicator. Three adjectives make up the GAC (appreciative, grateful, and thankful). On a five-point Likert scale, participants are asked to rate the intensity with which they are currently experiencing each of these emotions: 1 (not at all), 2 (a little), 3 (moderately), 4 (quite a bit), and 5 (quite a bit) (extremely). The ratings on these three descriptors are added together to provide a total score. Scores range from 3 to 15, with higher scores reflecting greater levels of state gratitude. The GAC has been shown to have good psychometric qualities, including a high level of internal consistency (Cronbach's alpha = 0.87) (McCullough et al.

2.2.4 Daily Spiritual Experience Scale (DSES)

The DSES (Underwood & Teresi, 2002) was employed as a measure of spirituality. The DSES is a self-report spiritual experience scale with 16 items. It tries to quantify ordinary, or daily, spiritual experiences, not mystical experiences (e.g., hearing voices), and how they are part of a person's normal life. The first 15 questions are answered on a Likert scale, with values ranging from 1 (many times a day) to 6 (never) (never or almost never). Question 16: "How near do you feel to God in general?" is answered on a 4-point scale (1 = not at all to 4 = as close as possible). The final score is calculated by adding the results of the 16 items, which can range from 16 to 94. The scale's Cronbach's Alpha is frequently more than 0.9 (Underwood & Teresi, 2002). The present study sample has Cronbach's alpha reliabilities ranging from .93 to .96.

2.3 Procedure: Quantitative data collection

The present research received approval from the Institutional Ethical Committee (anonymous reference). Participation in this study was voluntary and only those participants who were willing to participate in the study were chosen. They were given the right to withdraw from the study at any time without citing any reason or explanation. Participants were selected through purposive sampling from IT companies in Delhi-NCR, and further, they were randomly allotted to the gratitude exercise group and control group. To maintain their confidentiality/anonymity all participants were assigned a number in place of their name. All participants were measured at 3 points in time: T1 (pre-exercise), T2 (post-exercise) after completing the exercises on day 30, and, T3 (one-month follow-up). At the beginning of day 1, participants in the gratitude exercise group were briefed on the study whereas participants in the control group were informed that they will be assessed on several measures over a period of time as part of research on well-being. All participants were asked to fill out the consent form and their demographic details. Then they were given a set of questionnaires to be filled which included a GAC, PANAS, SWL, and DSES.

After filling out the questionnaire, participants in the gratitude exercise group were further assigned the task of maintaining a gratitude journal, in which they had to list at least three things that they are grateful for and their causes twice a week for 1 month. Following instructions were given which were based on Emmons and McCullough (2003) with some modifications to make it more specific in terms of the present investigation:

"There are many things in our lives, both large and small, that we might be grateful about. Think back over the past days, and write down three things in your life that you are grateful or thankful for".

Participants were asked to perform these exercises on any two days a week. But there should be a gap of at least two days between the exercises. Participants were also asked to express their gratitude in either written behavioral or verbal expressions towards the people they felt grateful for at least once during one month of performing the written exercise.

Participants in the gratitude group were contacted each week during the intervention to assess progress and answer questions. In the control group, participants were not assigned any such tasks. At the end of one month (post-exercise), participants of both groups were asked to fill out the same set of questionnaires again. For the follow-up at one-month post-exercise, all the participants were again asked to fill out the same set of questionnaires.

2.4 Power analysis

An a priori power analysis using G*Power3 (Faul et al., 2007) was run to test the efficacy of gratitude exercise in promoting wellbeing using repeated measures, within-between interaction involving two groups and three measurement points, a medium effect size ($f^2 = 0.25$), and an

alpha of .05. Result showed that a total sample of 44 participants was required to achieve a power of .95. Thus, our actual sample size, $N = 120$ was more than adequate for the main objectives of this study and allows for moderation analysis with effect size and an alpha level of .01.

3. Quantitative results

3.1 Data Screening

Upon submission, all metrics were double-checked for accuracy. No univariate or multivariate outliers were detected in the dataset. Skewness and kurtosis were examined for all the key variables at all three time points i.e., pre-exercise, post-exercise, and one-month follow-up. Skewness ranged from $-.79$ to $.1.07$ and kurtosis from -1.12 to $.77$, respectively. Thus, all measures were deemed approximately normally distributed. Positive affect, negative affect, satisfaction with life, gratitude, and spirituality at T1, were mean-centered to avoid multicollinearity. All variance inflation factors in our regressions were below 3, suggesting that multicollinearity was not an issue in our analyses.

3.2 Preliminary analyses

Independent samples t-tests were used to investigate differences in pre-exercise (baseline) scores on gratitude, satisfaction with life, positive affect, negative affect, and spirituality between the Gratitude Group and the Control Group. For baseline spirituality, there were significant differences between the two groups, $t(118) = 2.03, p = .05$. Participants in the Gratitude Group had lower spirituality at baseline ($M = 58.01, SD = 14.99$) than those in the Control Group ($M = 63.28, SD = 13.29$).

There were no differences between the two groups for the initial state gratitude: $t(118) = .95, p = 0.34$; satisfaction with life: $t(118) = .48, p = 0.62$; positive affect: $t(118) = .31, p = 0.76$; and negative affect: $t(118) = 1.42, p = 0.15$. Table 1 shows means and standard deviations generated for both the gratitude intervention group and control group on all variables of interest at every time point.

Table 1. Means and standard deviation for positive affect, negative affect, satisfaction with life, gratitude, and spirituality of both groups at all three time points

Group	Gratitude Intervention	Gratitude Intervention	Gratitude Intervention	Control Group	Control Group	Control Group
Time	T1	T2	T3	T1	T2	T3
PA	31.63±8.51	33.50± 7.50	33.85± 6.81	31.16± 8.20	29.15± 7.60	28.10± 6.10
NA	19.60± 6.94	15.85± 5.50	15.31± 5.20	17.93± 5.81	18.65± 5.34	19.30± 4.73
SWL	22.55± 4.90	25.35± 3.90	25.55 ± 4.32	22.97± 4.47	22.12± 4.35	21.87± 4.05
GAC	10.10± 2.75	11.45± 2.10	11.70± 2.31	10.53± 2.42	9.50± 1.10	9.45± 1.10
DSES	58.02± 14.1	61.50± 14.1	62.03± 15.56	63.30± 13.30	62.23± 13.25	62.27±12.67

3.3 Mixed analysis of variance

A mixed between-within-subjects analysis of variance was conducted to assess the impact of the condition (gratitude exercise vs. no exercise or controls) on participants' scores on Satisfaction with life, Positive affect, Negative affect, gratitude, and spirituality across three-time points (pre-

exercise, post-exercise, and one-month follow-up). Because Mauchly's Test of Sphericity was significant for positive affect ($p < .001$), negative affect ($p < .001$), satisfaction with life ($p < .001$), gratitude ($p < .001$), and spirituality ($p < .001$), a multivariate statistic was employed to determine the significance of the associated F . All statistical enterprise was performed using Statistical Package for Social Sciences-21 (SPSS²¹).

There was a significant interaction between group and time for Positive affect: Wilk's $\lambda = .70$, $F(2, 117) = 29.90$, $p < .001$; $\eta_p^2 = .34$. Moreover, simple effects tests showed that the difference between the two levels of condition was significant at T2: $F(1, 118) = 10.01$, $p < .01$, $\eta_p^2 = .07$ and T3: $F(1, 118) = 21.10$, $p < .001$, $\eta_p^2 = .15$, respectively.

There was a significant interaction between group and time for Negative affect: Wilk's $\lambda = .74$, $F(2, 117) = 19.10$, $p < .001$; $\eta_p^2 = .25$. Simple effects tests showed that the difference between the two levels of condition was significant at the T2: $F(1, 118) = 8.04$, $p < .01$, $\eta_p^2 = .06$ and T3: $F(1, 118) = 18.10$, $p < .001$, $\eta_p^2 = .14$, respectively.

There was a significant interaction between group and time for Satisfaction with life: Wilk's $\lambda = .71$, $F(2, 117) = 23.53$, $p < .001$; $\eta_p^2 = .29$. Simple effects tests showed that the difference between the two levels of condition was not significant at T1, $F(1, 118) = .24$, $p = .63$, but was significant at T2: $F(1, 118) = 18.38$, $p < .001$, $\eta_p^2 = .14$ and T3: $F(1, 118) = 23.23$, $p < .001$, $\eta_p^2 = .19$, respectively.

There was a significant interaction between group and time for gratitude: Wilk's $\lambda = .70$, $F(2, 117) = 28.92$, $p < .001$; $\eta_p^2 = .33$. Moreover, simple effects tests showed that the difference between the two levels of condition was significant at T2: $F(1, 118) = 27.83$, $p < .001$, $\eta_p^2 = .20$ and T3: $F(1, 118) = 32.61$, $p < .001$, $\eta_p^2 = .21$ respectively.

Thus, at T2, the gratitude exercise group participants showed an increase in gratitude, life satisfaction, positive affect, and a decrease in negative affect when compared to the control group, and this difference was maintained at T3. For spirituality the results found a significant interaction between group and time: Wilk's $\lambda = .78$, $F(2, 117) = 16.72$, $p < .001$; $\eta_p^2 = .22$. However simple effects tests showed that the difference between the two levels of condition was not significant at T2: $F(1, 118) = .08$, $p = .77$ and T3: $F(1, 118) = .00$, $p = .94$, respectively (the mean difference between the groups was larger at time 1 however it was too small at T2 and almost similar at T3 thus signifying a disordinal interaction).

3.4 Hierarchical multiple regressions to test spirituality as moderator

To determine whether spirituality moderates the effect of gratitude exercise on gratitude, satisfaction with life, positive affect, and negative affect, baseline spirituality (T1) was tested as a moderator at two points in time: post-exercise (T2) and at a one-month follow-up (T3). T1 spirituality was tested in 8 unique hierarchical regression models to see if it moderated the effects of the condition on gratitude, satisfaction with life, positive affect, and negative affect at T2 and T3. In Step 1, the main effects for the dependent variable at T1 were entered when gratitude, satisfaction with life, positive affect, and negative affect were the criterion. The primary impacts of the condition were entered in Step 2. The primary impacts for the moderator (T1 spirituality) were entered in Step 3. Finally, the condition \times T1 spirituality interaction was added in step 4. When the interaction term is significant after controlling for the main effects of the predictor (condition) and moderator (T1 spirituality), moderator effects are evident (Baron & Kenny, 1986). Significant interaction effects were investigated using simple effect analysis (Aiken & West, 1991). The condition was dummy coded (e.g., standard indicator coding) by creating two dummy variables using 0s and 1s for gratitude and control conditions, respectively.

Table 2. Hierarchical regression models of condition (group) predicting T2 NA, T3 NA, T3 PA, and T3 gratitude, with baseline spirituality as a moderator

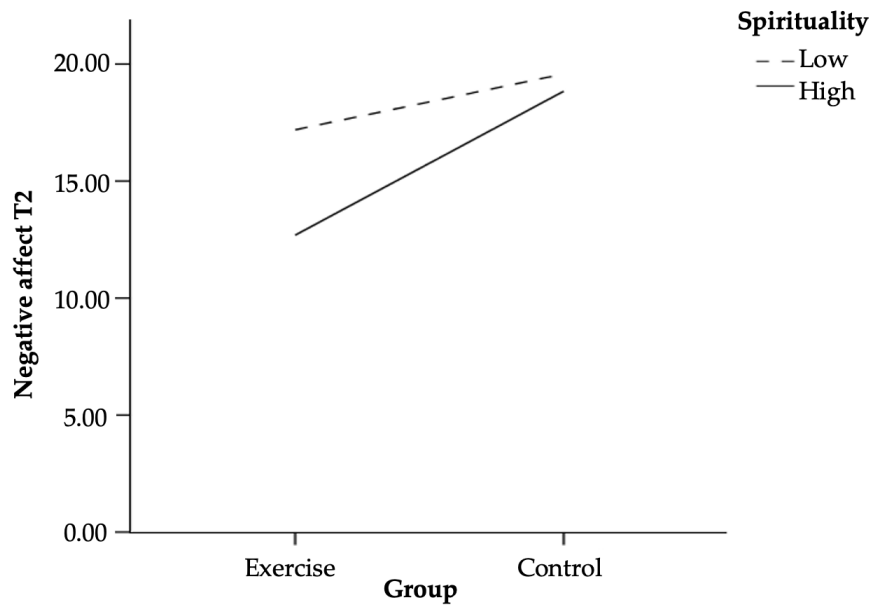
Step		B	SE B	B	R ²	ΔR ²
Dependent variable: T2 Negative affect						
1	T1 Negative affect	.58***	.06	.67	.44	.44***
2	T1 Negative affect	.61***	.05	.71	.56	.12***
	Group	3.82***	.69	.35		
3	T1 Negative affect	.58***	.05	.68	.62	.06***
	Group	4.30***	.65	.39		
	Spirituality	-.10***	.02	-.26		
4	T1 Negative affect	.59***	.05	.69	.65	.03**
	Group	4.27	.63	.39		
	T1 Spirituality	-.16***	.03	-.41		
	Group × T1 Spirituality	.12**	.04	.22		
Dependent variable: T3 Negative affect						
1	T1 Negative affect	.46***	.06	.56	.32	.32***
2	T1 Negative affect	.51***	.05	.62	.52	.20***
	Group	4.81***	.68	.45		
3	T1 Negative affect	.48***	.05	.58	.57	.06***
	Group	5.25***	.65	.49		
	Spirituality	-.08***	.02	-.25		
4	T1 Negative affect	.49***	.05	.69	.65	.03**
	Group	-2.73	2.78	-.25		
	T1 Spirituality	-.15***	.03	-.41		
	Group × T1 Spirituality	.13**	.04	.82		
Dependent variable: T3 Positive affect						
1	T1 positive affect	.74***	.04	.83	.69	.69***
2	T1 positive affect	.73***	.03	.82	.83	.13***
	Group	-5.42***	.56	-.36		
3	T1 positive affect	.69***	.03	.77	.83	.01**
	Group	-5.78***	.55	-.40		
	Spirituality	.06**	.02	.12		
4	T1 positive affect	.70***	.03	.77	.84	.00*
	Group	-1.26	2.43	-.08		
	T1 Spirituality	.09**	.02	.20		
	Group × T1 Spirituality	-.07*	.03	-.33		
Dependent variable: T3 gratitude						
1	T1 gratitude	.52***	.07	.56	.31	.31***
2	T1 gratitude	.57***	.06	.60	.58	.26***
	Group	-2.50***	.30	.52		
3	T1 gratitude	.42***	.06	.45	.65	.07***
	Group	-2.72***	.27	-.56		
	Spirituality	.05***	.01	.31		
4	T1 gratitude	.43***	.05	.46	.67	.01*
	Group	-.10	1.16	-.02		
	T1 Spirituality	.07***	.01	.42		
	Group × T1 Spirituality	-.04*	.02	-.58		

Note. The group was coded as 0 = Gratitude, 1 = Controls. T1=baseline. T2= post-exercise. T3=one month follow-up
 ** $p < .01$ *** $p < .001$. All p -values were two-tailed.

It was found that spirituality moderated the relationship between gratitude exercise and dependent variables. Significant condition × T₁ spirituality interactions were found for T2 Negative affect ($p = 0.003$) (Figure1), T3 Negative affect ($p = 0.003$) (Figure2), T3 Positive affect ($p = 0.05$) (Figure 3), and T3 Gratitude ($p = 0.02$) (Figure 4). No interaction effect was found for T2 Satisfaction with life ($p = 0.52$), T3 Satisfaction with life ($p = 0.12$), T2 Positive affect ($p = 0.52$), and

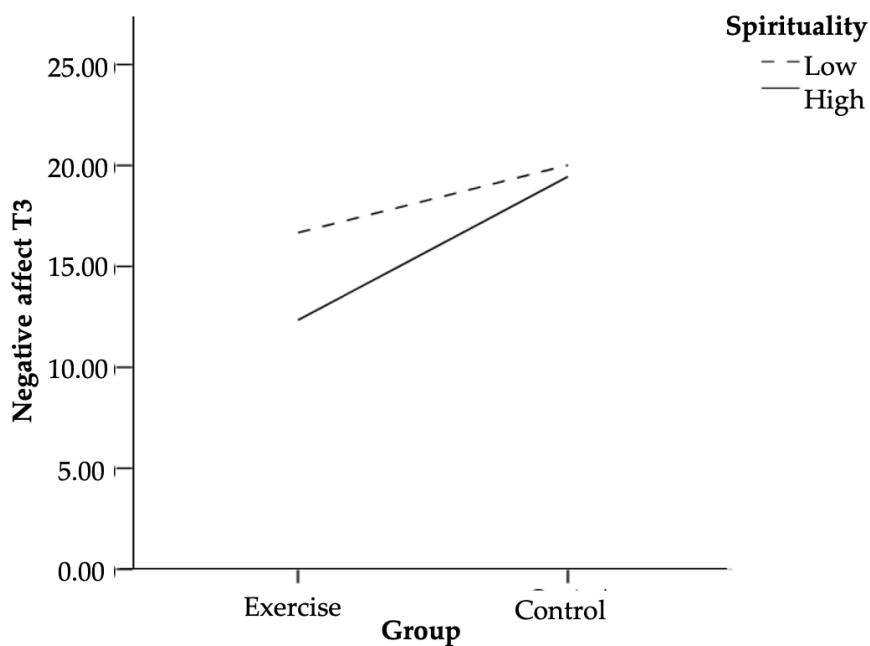
T2 Gratitude ($p = 0.09$).

Figure. 1 Negative affect at T2 as a function of group and baseline T1 spirituality



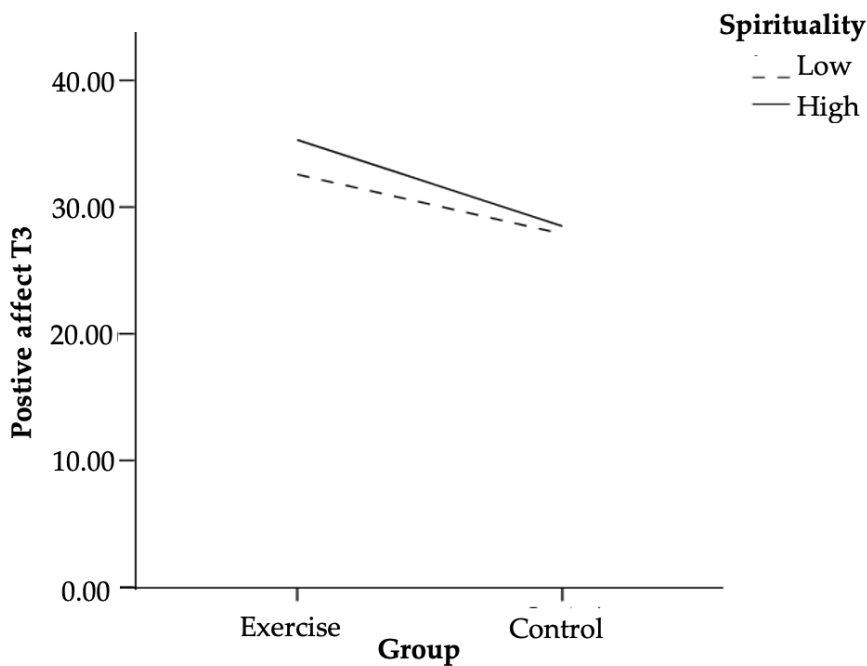
Note. Low=1 SD below the mean for T1 spirituality; High=1 SD above the mean for T1 spirituality.

Fig. 2 Negative affect at T3 as a function of group and baseline T1 spirituality



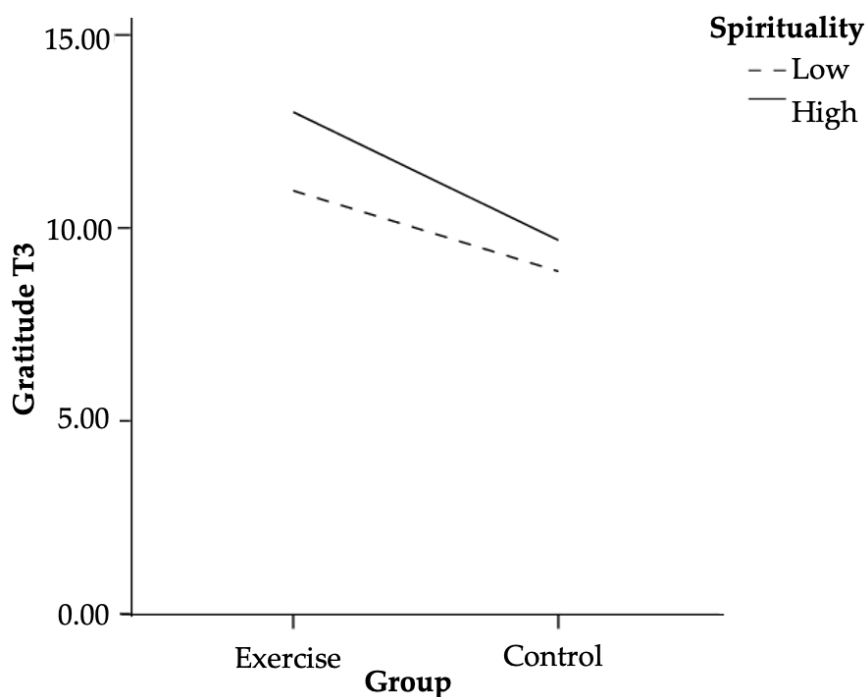
Note. Low=1 SD below the mean for T1 spirituality; High=1 SD above the mean for T1 spirituality.

Figure. 3 Positive affect at T3 as a function of group and baseline T1 spirituality



Note. Low = 1 SD below the mean for T1 spirituality; High=1 SD above the mean for T1 spirituality.

Figure. 4 state gratitude at T3 as a function of group and baseline T1 spirituality



Note. Low=1 SD below the mean for T1 spirituality; High=1 SD above the mean for T1 spirituality.

Simple effect tests show when the T₁ spirituality was either low or high, the controls compared to the gratitude group, significantly predicted more NA at T₂: $t(115) = 2.69, p < .01$, and $t(115) = 6.91, p < .001$, and at T₃: $t(115) = 3.69, p < .01$ and $t(115) = 7.95, p < .001$. However, the effect was more pronounced when the T₁ spirituality was relatively high.

Similarly, when the T₁ spirituality was either low or high, the controls compared to the

gratitude group significantly predicted more PA at T3: $t(115) = 5.20, p < .001$, and $t(115) = 8.31, p < .001$ and significantly predicted more gratitude at T3: $t(115) = 5.50, p < .001$, and $t(115) = 8.91, p < .001$.

These results suggest that participants in the gratitude group with high spirituality scores at T1 benefitted more as compared to the participants with low T1 spirituality. Table 2 shows the results of the statistically significant regression analysis.

4. Qualitative study methods

4.1. Qualitative data participants

Based on the findings of the quantitative data analysis a sample of 10 high spirituality and 10 low spirituality ($N = 20$) participants at baseline were randomly selected for the qualitative analysis. Participants' ages range from 28-32, with a Mean age of 29.6 years ($SD = 1.35$). Out of 20, there were 11 males and 9 females, 2 Muslims, and 18 Hindu participants. Participants' names were changed and pseudonyms were used to protect their confidentiality.

4.2 Procedure: Qualitative data collection

The point of the interface in sequential designs occurs between and after the phases; the results of one phase inform the data collection and analysis of the second phase (Creswell & Plano Clark, 2011). The quantitative results of the present study found that spirituality moderated the relationship between gratitude exercise and well-being. Therefore, participants for the qualitative analysis were selected based on this finding, and research questions were formulated accordingly. The present study used Interpretative Phenomenological Analysis (IPA) (Smith et al., 2009) for qualitative data collection and analysis.

The following questions were explored qualitatively using IPA:

1. How do high and low spiritual participants experience the gratitude exercises?
2. What impact does the gratitude exercise have on the sense of well-being and spirituality among high and low-spirituality participants?

A semi-structured interview schedule based on IPA guidelines (Smith et al., 2009) was prepared. The interview schedule focused on the experience of performing the gratitude exercises and their effect on the participants. Here are two sample questions from the schedule: (1) How did you feel after writing and expressing your grateful feelings? (2) What changes did you experience after performing this exercise? Questions were open-ended and the schedule was used very flexibly in the interview. The semi-structured interview was administered to the selected participants. These interviews were audio-taped and transcribed verbatim.

Based on the interviews, themes, and sub-themes were identified using the guidelines of IPA as suggested by Smith et al. (2009). The transcript analysis began with a full reading to obtain a sense of the story, followed by multiple systematic reads in which the researcher recorded thoughts, keywords, points of view, and attitudes. The researchers examined the side comments to identify potential themes and subthemes, which were then compared to the text to ensure that the meaning of the words was maintained. Following a final reading of the transcript with the emerging themes, they were updated, recombined, and clustered to offer a clear picture of the participant's story. The table of themes and subthemes was established by the two authors by comparing notes and auditing each other's work, and the second author revised it.

4.2.1 Reflections

Yardley (2000) details four principles for assessing the merits of qualitative work: sensitivity to context, commitment and rigor, transparency and coherence, and impact and importance. A considerable number of direct quotes from the participants throughout the written analysis of the study, and presenting their interpretations carefully and thoughtfully were done in an attempt to maintain sensitivity to context. Each interview was conducted with similar rigor and attention to detail. The analysis was rigorous, systematic, and in keeping with the principles of IPA. To maintain transparency and coherence of the research findings, a detailed description of the method and verbatim quotations from participants have been included.

5. Qualitative results

5.1. Experience of performing the gratitude exercise

The first theme identified in the present analysis was the experience of performing the gratitude exercise. It was further categorized under subthemes of positive and meaningful activity, and gratitude as a debt.

a) Positive and Meaningful Activity. All participants described the exercise as a positive experience. They were able to understand their grateful feelings and appreciate them after performing the exercise as is illustrated in participant Shruti's experience.

"I realized that these things have always been there in my life, for example, many small things like having a healthy body, having fresh air to breathe, good food to eat, etc., which I never thought were a blessing until I did this exercise." Shruti

Participant Yash was able to appreciate his daily blessings which made his days seem more positive and meaningful. Similarly, other participants described it as an activity that made them feel relaxed and positive after a busy day.

"It was interesting to think of the positive things that happened in the day and I was surprised to realize that my days were not as bad as I thought. There were so many things in the day for which I felt grateful like my family, my home my job, and many others." (Yash)

b) Gratitude as a Debt. 5 out of 10 participants with low spirituality perceived gratitude as help that should be returned in some way. None of the participants with high spirituality experienced such feelings. For example, Kavita and Abhishek mentioned the necessity to feel grateful after receiving help, yet they felt the need to return it.

"If a person has done something for me then it is very important that I should be thankful for them. But they have done it you know because I am doing some things for them. I am helping them, and they are helping me in return." (Kavita)

"It is not that I am not thankful to her (sister). Yes, she has done good things for me, but because she knows that I will also be available whenever she needs." (Abhishek)

5.2. Gratitude expressed towards

The second theme identified in the present analysis was Gratitude expressed. It was further categorized under subthemes of gratitude expressed towards relations, towards others, towards God or a universal force, towards nature, and towards day-to-day life.

a) Towards Relations. Being grateful towards different relations like parents, spouses, siblings, friends, etc. in their life was a major part of the gratitude list. There was no difference

between low and high-spirituality participants for this subtheme. Participants Priya, Vaishali, and others expressed gratitude for their relations on every list.

“In my every list, I have thanked my parents, my husband, and my sister because they matter to me each day. They are the source of my blessings and they make my life beautiful by being there for me in my all ups and downs.”
(Priya)

“I am grateful to have so many good relations in my life. I have a loving family, a good husband, a beautiful baby, and some good people whom I can always trust.” (Vaishali)

b) Towards Others. This subtheme emerged among 9 high spirituality and 2 low spirituality participants. High spirituality participants had a broader range of people for whom they felt grateful. It included not just people with whom they had close relations like parents or spouses but also their teachers, mentors, house helps, and even some strangers, etc.

“I am grateful for several people in my life who have guided me at different stages of my life, my school teachers and mentors, my closest friends, and some people in my office as well.” (Riya)

“Once I was traveling in an auto and I forgot my wallet, the moment I realized this I was so worried about what will I do, but to my surprise that auto driver was so kind that he left me at my destination without any charge, and this gesture made me feel so grateful”. (Shazia)

c) Towards God or a Universal Force. Being thankful towards God or a universal force was reported by 10 high and 5 low spirituality participants. Participants Jaya and Shruti felt grateful by realizing the love and blessings they received from God in their lives.

“I often feel and admire the beauty that is around me. The beauty that God has created and I am thankful for living in such a good environment, and to be born in a religion which helps me to admire the beauty around me”. (Jaya)

“Whenever I write my blessings, I feel more and more grateful to God. The bounties I receive even though I don’t find myself worthy of those gifts but yet God has given me all.” (Shruti)

Jaya, Shruti, Aman, and other high spirituality participants discussed the role of their religion in helping them feel grateful for different aspects of their life and attributed the major source of their blessings to God. However, 4 participants in the low spirituality group attributed the reason for their blessings and good things in life to their hard work and efforts.

d) Towards Nature. This subtheme emerged in 10 high and 6 low spirituality participants. Participants expressed their gratitude towards natural things like trees, flowers, mountains, etc., and for the beautiful surroundings, they live in. Vikas, Prakhar, Riya, and Aman expressed gratitude towards the places they had traveled to, and for the times they had spent in natural places.

“I am thankful for the beautiful places that I had seen, the mountains, rivers, greenery, etc., and whenever I am in a beautiful place, I feel blessed.” (Vikas)

Shazia felt thankful for the gifts of nature and attributed the cause of this gift to God and her religion.

“Yes, I feel grateful for the natural things like you know the trees, wind, flowers, and all that I get from nature. But because I am a religious person, I would attribute it to God. Nature is a mirror of God that is what we have been taught”.

(Shazia)

e) *Towards the Day-to-Day Life*. This subtheme was reported by all participants. Participants mentioned their grateful feelings for being able to live in a good place and have a good meal every day, they were thankful for the jobs they were doing and for the good things and luxuries, they were able to afford.

“I think I have become more grateful for my job now. Earlier I used to think only about the bad aspects of my job but while doing this exercise I realized that my company has so many good policies and job security.” (Vikas)

“I can exercise, watch movies, relax, listen to good songs, or do any activity that I like. Though they are small things they are all the blessings we have because there are so many people who are not able to even afford a single meal.” (Priya)

5.3 Benefits of the exercise

The third theme identified in the present analysis was the benefits of the exercise. It was further categorized under subthemes of abstracting positive meaning from negative experiences, becoming more considerate in relationships, becoming less complaining, feeling closer to God, feeling more motivated in day-to-day life, and expressing and sharing grateful feelings with others.

a) *Abstracting Positive Meaning from Negative Experiences*. This subtheme emerged in 6 high spiritual participants whereas none of the low spirituality participants were able to relate their painful experiences with feelings of gratitude.

“I lost somebody very close to me because of cancer and I, therefore, understand the importance of the life we have got at the moment. You never know when that is to be gone and for that, you need to be very grateful for that higher power.” (Riya)

“There were times when I used to hate my father for being so strict with me. But today I feel grateful for that, because, if he had not been that strict with me, I would have never become what I am today.” (Aman)

Similarly, Priya, Shreya, Vikas, and Prakhar described some events that seemed negative to them when they occurred, but they were able to derive positive meaning from them later at some point in their life and were able to feel grateful about those experiences.

b) *Becoming more Considerate in Relationships*. This subtheme emerged among 10 high and 6 low spirituality participants. Performing the gratitude exercise made participants more appreciative of their parents, spouses, partners, siblings' friends, etc.

“Though they have always been there in my life, after doing the exercise I realized that they are so special and precious to me, and I can do anything to make them happy.” (Riya)

“I never realized earlier but I understand now that even for providing me a good meal on time every day, how much effort she puts in. It is not the effort but the feeling of love and care that is involved is all that matters.” (Prakhar)

Similarly, participants Yash, Pankaj, Nikhil, Vaishali, and others were also able to understand the efforts their parents, partners, and others make for them which made them feel closer to these relationships.

c) *Becoming Less Complaining*. This subtheme emerged among 10 high and 5 low spirituality participants. Participants reported becoming more appreciative and less complaining after

performing the exercise. Participant Vinay felt that it was important to appreciate life's blessings instead of complaining.

"Even if we have a problem, we should stay grateful for the things we have. We are not grateful for the sixty good things but instead, we keep complaining about the forty things that are not good. Seeing those sixty things can make us change those forty things as well". (Vinay)

By performing the gratitude exercise Prakhar was able to gain insight and motivation to deal with his problems.

"I think I see fewer problems and try to find more solutions now. I know that I have dealt with so many problems earlier and I can very well deal with them at any time." (Prakhar)

d) Feeling Closer to God. This subtheme was reported by 10 high and 5 low spirituality participants. Participants Shruti, Vikas, Jaya, Shazia, and Shreya, reported feeling a more prominent presence of God in their lives after doing the exercise. Riya experienced the unconditional love of God in her life.

"I knew that he is always there with me, but I can feel his presence even in the tiniest things now. In every moment that I live, he is always there. It's all because of him that I have so many things to be thankful for." (Riya)

"I think that there is some kind of force that has always helped me. I realized that there were many situations in my life from which I thought I will not be able to come out. But something unexpected happened like a miracle and that problem got solved." (Nikita)

Participants Shruti, Vikas, Jaya, and Shazia, felt that they were blessed despite their faults, which made them feel nearer to God. Low spirituality participant Nikita was able to understand the presence of an unseen force that helped her at different times in her life.

"I think that there is some kind of force that has always helped me. I realized that there were many situations in my life from which I thought I will not be able to come out. But something unexpected happened like a miracle and that problem got solved." (Nikita)

Similarly, some other low spirituality participants Yash, Ankit, Kavita, and Akash were also able to feel closer to God, a natural force, or an unseen power in their life. They were grateful to God or a universal force that had provided them with all the blessings in their life.

e) Feeling More Motivated in Day-to-Day Life. This subtheme emerged in 10 high and 8 low spirituality participants. Participants were able to appreciate the daily gifts like living in a good place, having time to spend with their families, etc. which made their everyday more positive and meaningful.

"We often think what a boring life we have. Doing the same things every day like, eating, sleeping, going to the office, cooking, cleaning the house, etc. But if we try to find meaning even in these small everyday activities, we can enjoy it." (Jaya)

f) Expressing and Sharing Grateful Feelings with Others. Participants used verbal, written, and behavioral forms to express their gratitude. Participants expressed gratitude towards their parents, and spouse after performing the gratitude exercise.

"I felt that I have never thanked my parents enough for what they have done so I brought a gift for them and thanked them, and they were so happy". (Shreya)

Some high spirituality participants Jaya, Priya, Shreya, and Shazia reported expressing their

gratitude in their prayers to the ones they could not directly thank and this was a major difference between high and low spirituality participants.

“There are many people who have directly or indirectly helped me in so many ways, but I could not thank them. So, I just pray to God for their well-being and to keep them happy always”. (Priya)

Six high spirituality participants expressed their gratitude towards others more than once during the exercise. Participants mostly preferred the verbal method to express their gratitude, as was reported by 9 high spirituality and 7 low spirituality participants. Behavioral expressions (e.g., giving a gift, taking for an outing, or preparing special meals, etc.) were used by 6 high and 4 low spirituality participants to express their gratitude.

6. Discussion

The present study aimed to examine the effectiveness of a gratitude exercise in enhancing the well-being of working Indian adults. It also aimed to study the role of spirituality as a possible moderator between gratitude exercise and well-being. Participants maintained a gratitude journal, in which they had to list at least three things that they were grateful for and their causes twice a week for 4 weeks. Participants were also asked to express their gratitude in either written behavioral or verbal expressions towards the people they felt grateful for at least once during one month of performing the written exercise. All participants were measured at 3 points in time: pre-exercise, post-exercise, and one-month follow-up.

Seven hypotheses were formulated for this study. The first six hypotheses predicted that participants in the gratitude exercise group will have increased positive affect, satisfaction with life, gratitude, and spirituality, and decreased negative affect as compared to the control group at post-exercise and follow-up.

The results found a significant increase in gratitude, SWL, and PA, whereas a significant decrease in the NA of participants performing the gratitude exercises as compared to control group participants. This effect persisted over time at the one-month follow-up. The findings of the present research are consistent with those of previous studies (Chan, 2010; Emmons & McCullough, 2003; Seligman et al., 2005).

The seventh hypothesis stated that spirituality will moderate the relationship between gratitude exercise and well-being, i.e., individuals with a high level of spirituality will benefit more from the gratitude exercise than those with a low level of spirituality. This hypothesis was confirmed partially, as spirituality significantly moderated the relationship between negative affect and gratitude exercise at post-exercise and one-month follow-up. Though spirituality did not significantly moderate the relationship between PA and gratitude post-exercise, it did predict this relationship at the one-month follow-up. Spirituality was not found to moderate this relationship for the variable satisfaction with life at post-exercise or follow-up. Participants with high spirituality scores at baseline scored low on negative affect at post-exercise and follow-up and scored high for PA and gratitude at follow-up compared to participants with low spirituality scores at baseline. An important mechanism to explain these results could be that after performing the gratitude exercise, there was an increase among the gratitude group for the scores of spirituality at both post-exercise ($M = 61.50, SD = 14.1$) and follow-up ($M = 62.03, SD = 15.56$).

Further, the results of the present study suggest the role of spirituality as a moderator was more visible in a longer duration, as it predicted the relationship between PA and gratitude at one-month follow-up but not at post-exercise. This pattern is an interesting finding of the present study and it should be further investigated in a long-term follow-up with participants of other

cultures.

Qualitative data were collected using IPA to gain an in-depth understanding of the quantitative results. With the help of qualitative data, we tried to identify the links between the findings of the present study with existing concepts and views and compared the similarities and differences that emerged among the high and low spirituality participants as a result of performing gratitude exercises.

Through IPA three themes were identified and categorized under several sub-themes. The subtheme of gratitude as debt emerged only among the low spirituality participants. Several studies have found low levels of gratitude among Asian societies (e.g., Naito & Sakata, 2010; Naito & Washizu, 2015) due to the feeling of indebtedness associated with the feeling of gratitude. The term "indebtedness" refers to a state of duty to repay another (Greenberg, 1980). If a person feels obligated to return after getting a benefit and is uncomfortable until they can, it is reasonable to expect that the person will have difficulty enjoying the gift and, as a result, will have difficulty identifying the gift's quality, resulting in less gratitude. The present study found that low spirituality participants perceived gratitude as a feeling that should be returned. However, none of the participants with high spirituality reported such feelings.

Another difference was found for the subtheme's gratitude towards others, and gratitude towards God. High-spirituality participants had a broader range of people for whom they felt grateful compared to low-spirituality participants. After performing the exercise participants with low spirituality were also able to thank God or a universal force for their blessings, they were able to understand the blessings that God has given them and hence were able to experience his presence in their lives. However, they did not attribute God as their major source of blessings as the high spirituality participants did. Moreover, some low spirituality participants attributed the reason for their blessings and good things in life to their hard work and effort.

When people are present with hardship, gratitude helps them change their attention from a mindset of deprivation to appreciation. Abstracting Positive Meaning from Negative Experiences was a subtheme that emerged only among high-spirituality participants. These participants were able to find positive meaning in their painful and negative life experiences. They felt that even those experiences that seemed to be negative at a particular time in their life made them later feel grateful. It could be another important mechanism in describing the results of the present study.

According to Watkins (2014), many religious people feel that God has rescued them from a bad situation and placed them in a privileged position in God's eyes, which they did not earn or deserve. It is evident from the experiences shared by high-spirituality participants in the present research. As positive affect improves people's ability to derive meaning from their experiences (Hicks et al., 2010; King et al., 2006), grateful people are likely to experience frequent gratitude. And because gratitude is a positive emotion, people who are high in gratitude are more likely to find significance in their daily lives and thus are more inclined to believe in an intelligent, compassionate supreme being.

Participants high in spirituality placed a lot of importance on their religion and religious belief in making them feel closer to God and nature. The use of prayers for expressing gratitude was a unique method of expression reported by the high-spirituality participants. Spiritually minded persons may feel more gratitude after a favorable event in which there is no human benefactor compared to a low spiritual person because they can attribute the gift to God or another transcendent source (e.g., McCullough et al., 2002). As a result, believers in a benevolent higher power effectively have more blessings to feel grateful for. However, people less religious or spiritual may attribute the same activities to luck and hence be less likely to feel grateful (Watkins, 2014).

The present study participants were able to improve their well-being by practicing gratitude exercises. The qualitative analysis of the study also highlights that participants were able to appreciate their jobs more after practicing the gratitude exercise. Studies have also found that thankfulness largely disconnects a workplace from toxic or negative environments (Cain et al., 2018; Komase et al., 2019), hence, it helps employees to share happiness explicitly; and also creates an accomplished and more satisfied work-life.

A window of opportunity has opened up because of the pandemic to consciously try to foster gratitude in the workplace. Lockdowns have made us more appreciative of the meaning and camaraderie that come with our jobs. The emerging norm of remote and hybrid work patterns also makes creating a strong organizational culture a genuine problem. Given that performing gratitude exercises are relatively simple and low-cost, organizations can improve the individual happiness of employees, as well as increase trust and employee engagement by establishing a culture of gratitude within organizations.

An important finding of the present study is that spirituality moderates the effect of gratitude exercise on well-being; individuals high on spirituality benefit more by practicing gratitude. Therefore, families can modify their practice of spirituality and gratitude so that it becomes a habit for everyone to guide young children through challenging situations as they mature.

6.1 Strengths, limitations, and future directions

This study adds to the existing body of knowledge in several ways. It required participants to express their gratitude along with writing their grateful feelings which resulted in the positive outcome of the study. Therefore, future gratitude studies can benefit by including expressions of gratitude along with the gratitude list exercise. It is the first study that we are aware of that has tried to see the effect of performing gratitude exercises on participants' spirituality. It also examined the role of spirituality as a moderator in the relationship between gratitude exercise and well-being. We anticipate that the findings of this study will benefit future research by taking into account the differential effects of the gratitude intervention on individuals with varying levels of spirituality.

However, when evaluating the findings of this study, some limitations must be acknowledged. Due to constraints of time and resources, the follow-up of the study was evaluated at one month, however, to study a long-term impact, future studies should include a longer duration for the follow-up. Moreover, spirituality means different things to different people, and the role of culture in shaping a person's overall meaning and understanding of spirituality is an important factor. Therefore, a replication of this study in a different cultural context may be valuable in determining the generalizability of the current findings.

Conflict of interest statement

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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Both authors developed the study concept and contributed to the study design. Supriya Srivastava managed the literature searches, data collection, and data analysis. The manuscript was drafted by Supriya Srivastava, and Naved Iqbal provided critical revisions. Both authors contributed to and approved the final version of the manuscript for submission.

Authors

Supriya Srivastava

Manav Rachna International Institute of Research and Studies, Faridabad, Haryana, India.
supriyasri2008@gmail.com

Prof. Naved Iqbal

Jamia Millia Islamia, New Delhi, India.

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