DOI: 10.52131/pjhss.2025.v13i4.3032

Pakistan Journal of Humanities and Social Sciences

Volume 13, Number 04, 2025, Pages 14-25
Journal Homepage:
https://journals.internationalrasd.org/index.php/pjhss

Professional Quality of Life and Metacognition in Pakistan's Hospital Teams: Moderation of Socio-Cognitive Mindfulness

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ARTICLE INFO

Article History:
Received: June 25, 2025
Revised: December 21, 2025
Accepted: December 22, 2025
Available Online: December 24, 2025

Keywords:
Metacognition
Professional Quality of Life
Hospital Teams
Mindfulness

Funding:
This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

Socio-cognitive mindfulness and metacognition are crucial in healthcare services that affect professional quality of life and, in turn, can affect patient outcomes. Socio-cognitive mindfulness relates to embracing novelty in healthcare situations through flexibility and engagement within medical work routines, through using expert executive cognitive control. Despite these psychological processes, there are presently no certified mindfulness programs that can bring improvement for health staff. This study explored the moderating impact of socio-cognitive mindfulness on the relationship between metacognition and professional quality of life in hospital team members of Pakistan. For this purpose, a purposive sample of 200 staff from two major hospitals in Lahore was recruited. Self-report questionnaires of socio-cognitive mindfulness, metacognition, and professional quality of life were completed. The findings showed that the hospital team members remain under stress that impacts professional quality of life. If there were higher levels of socio-cognitive mindfulness, it resulted in improved compassion satisfaction and perceived support. Hence, it lowered the levels of burnout, moral distress, and secondary trauma stress in health teams. Furthermore, socio-cognitive mindfulness emerged as a significant moderator between metacognition and professional quality of life across different professional roles. Thus, the study indicates towards inclusion for certified mindfulness programs tailored for healthcare settings.

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1. Introduction

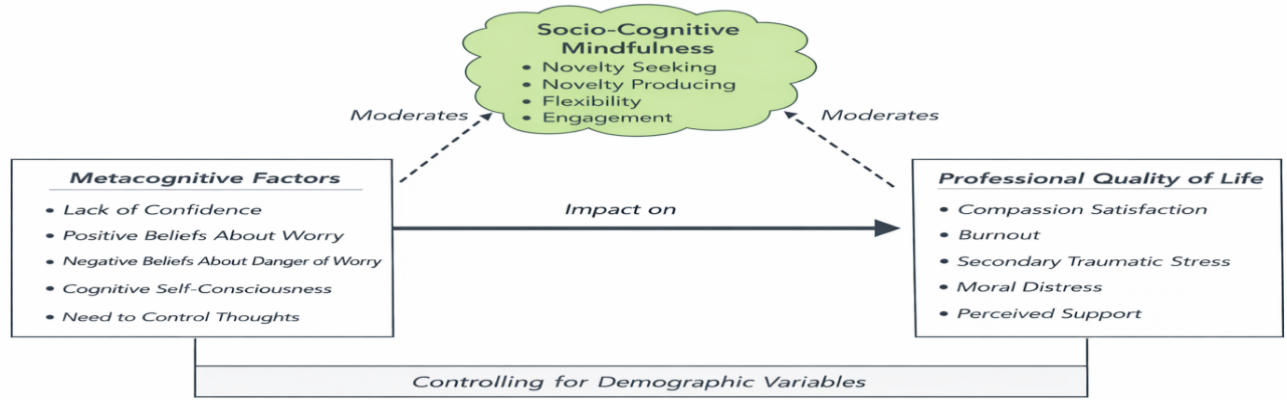
In recent times, professional quality of life for hospital teams remains burdensome and stressful (Getie et al., 2025). Yet, the improvement in their lives can be brought by management of secondary trauma stress, burnout, and moral distress. Compassion, satisfaction and perceived support can be promoted through socio-cognitive mindfulness that can be delivered through mindfulness programs (Freitas et al., 2025). Currently in Pakistan, there remains a dire shortage of healthcare workers, which can pressurize the existing workforce, leading to poorer psychological safety and increased incidence of medical errors (Shahbaz et al., 2021). Presently, there is a dearth and scarcity of formal mindfulness programs and courses that can improve mindfulness and metacognitive skills in healthcare professionals. The rising stress levels can negatively impact the mental well-being of the hospital's staff and the patients. Amidst the crisis, the socio-cognitive mindfulness can enhance higher-order thinking skills and improve professional outcomes by lowering specific outcomes of burnout and secondary trauma stress (Havnen, Anyan, & Nordahl, 2024). In the sample of hospital teams, enhanced metacognitive processes that include complex patterns of thinking and decision making paired with affective novel mechanisms related to mindfulness can promote mental well-being (Upadhyay, Shukla, & Pandey, 2024). Effective high-order problem-

solving skills related to metacognition can shape coping strategies at work (Ferro et al., 2023). As mindfulness practices become the norm, individuals can better handle their volatile emotional states that helps in psychological recovery for health staff (Abu-Horirrah et al., 2022; Kotera, 2021). If hospital team members undergo socio-cognitive mindfulness training in early career stages, it can help them to regulate their emotions in an effective manner (Julian, 2025). Moreover, if metacognitive beliefs are managed from the perspective of lower rumination and constant worry, it can aid in controlling anxiety and depression (Jackson & Jones, 2025).

As cognitive abilities are improved, similarly, emotional stability is also perceived positively through the practice of mindfulness (Charvin et al., 2025). Different emotion-based disorders improve as different facets of mindfulness, in terms of novelty seeking, novelty producing, engagement at work, and flexibility in routine is embraced (Solem et al., 2015). Moreover, the critical element of medical decision-making can be eased through fostering socio-cognitive mindfulness within healthcare settings (Ruiz-Fernández et al., 2020; Strauss et al., 2021). As Leonard (2019) postulates, it is important for the mindfulness programs and courses to be embedded in Social Baseline Theory, which is integral to promoting relatedness in healthcare settings, that reflect interconnectedness and greater social well-being at work (Coan & Sbarra, 2015). The integration of the foundations related to Well's Metacognitive Theory (2010) and Langer's Socio-Cognitive Mindfulness Theory (1992), the thought patterns are essential to attend to work with an appreciation of novelty. The Metacognitive Theory relates to the idea of reducing rumination and negative thoughts to improve work outputs, and Langer's Mindfulness Theory resorts to cognitive acceptability and flexibility linked to adaptation of the workplace(Ahmed, Azhar, & Mohammad, 2024; Mohammad, 2015). It is important to note that the Cognitive Attentional Syndrome (CAS) links to constant worry, lack of confidence in memory, positive beliefs about worry, negative beliefs about danger or uncontrollability of worry, cognitive self-consciousness, and a strong need to control thoughts. For frontline workers, it is important to have both mindful and cognitive skills that can improve professional quality of life. Langer's mindfulness further indicates to opt for a cognitive style, rather than indulge in intrapersonal meditative processes, to ultimately reduce stress and improve workplace well-being(Ragmoun & Alfalih, 2025; Wided & Abdulaziz, 2024). In synthesis, socio-cognitive mindfulness enhances professional quality of life in healthcare teams. The rising burden on the healthcare industry across the globe underscores the requirement of socio-cognitive mindfulness to be practiced in a clinical environment. The moderating role of socio-cognitive mindfulness between metacognition and professional quality of life must be explored and investigated in relation to the factors of burnout, secondary trauma stress, and moral distress (Selič-Zupančič, Klemenc-Ketiš, & Onuk Tement, 2023).

Since due to lack of empirical mindfulness-based program studies in South Asian healthcare settings, this study has its potential. Thus, it is hypothesized that socio-cognitive mindfulness will buffer the relationship between metacognitive factors and professional quality of Life (Figure 1). The study's main research objective is to explore the moderation of socio-cognitive mindfulness between metacognition, lack of confidence, positive beliefs about worry, negative beliefs about danger of worry, cognitive self-consciousness, need to control thoughts, and professional quality of life while controlling for demographic factors. The study hypothesizes that socio-cognitive mindfulness significantly moderates the relationship between metacognition and sub-predictors, and professional quality of life.

Figure 1: Socio-Cognitive Mindfulness Moderation Framework



2. Materials and Methods

2.1. Design

This study is a correlational cross-sectional design that was completed under STROBE guidelines to evaluate the moderating effect of socio-cognitive mindfulness on professional quality of life factors in terms of compassion satisfaction, perceived support, burnout, secondary trauma stress and moral distress; and between metacognition in terms of lack of confidence, positive beliefs about worry, negative beliefs about dangers of worry, cognitive self-consciousness, and need to control thoughts.

2.2. Setting

Two major hospitals in Pakistan were targeted for the study. The hospital team members included doctors, nurses, support/administrative staff, and allied health professionals.

2.3. Sample

A purposive sampling was used to recruit the hospital team members. They were given self-report paper questionnaires to fill out. Inclusion criteria take into account active hospital employees who have been working in the designated hospitals since 2023 to date, with proficiency in the English Language, as it is the official language of tertiary care workers. A total of 200 health workers completed the surveys out of 280.

2.4. Data Collection

The approval was taken from the Ethics Committees of AviCenna Medical Hospital, Pakistan, and Khair Un Nisa Hospital, Pakistan. The study adheres to the research protocol of the Department of Psychology, Hazara University, Pakistan, with approval number HU/PSY/15. The healthcare professionals filled out pen and paper self-report questionnaires that were distributed and collected. Written informed consent was taken from the participants. Permissions were sought from the head of medical institutions.

2.5. Instruments

The tools of assessment that were used were:

1) Professional Quality of Life Scale

The ProQol scale consists of 30 items measured on a 5-point Likert Scale; 5 sub-scales, scored on 1= Never, 2= Rarely, 3 = Sometimes, 4=Often, 5= Very Often. The subscales relate to compassion satisfaction, perceived support, burnout, secondary trauma stress, and moral distress. This scale was developed by Dr Beth Hudnal Stamm. The Cronbach alpha is reported between 0.70 and 0.90.

2) Metacognition Questionnaire

The MC Scale consists of 30 items measured on a 4-point Likert Scale. Subscales include polarity of beliefs, cognitive strength, and control over thoughts. The specific five domains include positive beliefs about worry, negative beliefs about uncontrollability and danger of worry, cognitive confidence, need for control, and cognitive self-consciousness. The scale was developed by Wells and Cartwright-Hatton (2004). The Cronbach alpha is reported as 0.77.

3) Socio-cognitive Mindfulness Scale

The LMS is a 21-item scale that measures mindfulness and mindlessness. The scale has four subscales of flexibility, novelty seeking, novelty producing, and engagement, scored on a 7-point Likert-type scale. The scale is by Langer (1992).mCronbach's alpha is reported as around 0.85. Sociodemographic information included gender, hospital member type, education, income, marital status, working hours, age and religion.

3. Data Analysis

The data was analyzed using IBM V.25 for descriptive and inferential statistics. The normality values were tested for parametric analysis as assumptions were met for homoscedasticity and linearity. The first aim was to explore the association among professional quality of healthcare workers' lives, metacognition and socio-cognitive mindfulness. For this purpose, Pearson product-moment correlation was used. Moreover, multilinear regression analysis was used to explore the effect of professional quality of life factors on metacognition. Hierarchical regression analysis was performed to assess the moderation of socio-cognitive

mindfulness between professional quality of life and metacognition. Mean centric values were calculated for socio-cognitive mindfulness and metacognition. An interaction term was generated for both mean-centric values of the predictor and moderator. Professional quality of life was added as the dependent variable. Demographic factors were controlled as shown in Figure 1.

3.1. Results

3.1.1. Demographics

Table1: Demographics (N=200)

Variables	N	%
Gender		
Male	113	56.5
Female	87	43.5
Hospital member type		
Doctor	54	27.0
Nurse	42	21.0
Support/Administrative	55	27.5
Allied health professional	49	24.5
Education		
Bachelors	62	31.0
Masters	61	30.5
Specialisation/ PhD	77	38.5
Income		
PKR25000-50000	23	11.5
PKR51000-75000	44	22.0
PKR76000-100000	65	32.5
PKR101000-120000	39	19.5
PKR121000 above	29	14.5
Marital Status		
Single	89	44.5
Married	97	48.5
Divorced	13	6.5
Widowed	1	0.5
Working Hours		
8-10 hours	94	47.0
More than 10 hours	106	53.0
Age		
18-30	25	12.5
31-40	63	31.5
41-50	53	26.5
51-60	28	14.0
60 above	31	15.5
Experience		
1-5	31	15.5
6-10	64	32.0
10-15	67	33.5
15 above	38	19.0
Religion		
Muslim	150	75
Chrisitan	50	25

According to Table 1., a total of 200 health workers (male, n=113; female n= 87) participated in the study. The sample consisted of 54 doctors, 42 nurses, 55 supportive and administrative staff and 49 allied health professionals. With respect to education, 62 were qualified with Bachelors (MBBS/BSN), 61 with Masters or sub-specialization and 77 with specialization or doctorate (such as FCPS). The monthly income generation varied. Most of the hospital staff members earned between PKR 76,000 and 100,000. This was followed by the income bracket of PKR 51,000–75,000 and then by PKR 101,000–120,000. This income only included salaried hospital-based earnings and not from any private clinical practice. Nearly half the participants reported being married, while many of them were single. More than half a percent reported working beyond 10 hours. The age range of the participants was wider for the group between 31-40 years, which included 63 participants; followed by the age group between 41-50 years, which included 53 participants. The younger medical professionals consisted of 25 participants; whereas between 51 and 60 years of age were a total of 28 participants. Senior medical professionals beyond the age of 60 were recorded to be 31. The

sample was predominantly Muslim, with 50 Christian staff members who formed the nursing group.

Table 2: Psychometrics

Scale	*K*	*α*	*M(SD)*	*Skewness*	*Kurtosis*
LC	6	.67	14.36(2.11)	.103	-.356
PW	6	.93	15.44(5.46)	-.218	-1.58
CC	6	.92	13.98(5.09)	.152	-1.51
NB	6	.93	14.82(5.46)	-.076	-1.48
NC	6	.91	11.58(4.15)	.121	-1.36
MCT	30	.96	70.19(19.41)	-.031	-1.80
MN	5	.95	18.58(7.69)	-.038	-1.67
MP	5	.96	18.97(7.74)	.080	-1.52
ME	4	.94	14.70(6.11)	.069	-1.55
MF	7	.96	25.37(11.82)	-.017	-1.83
SCM	21	.98	77.87(32.27)	-.021	-1.92
CO	6	.93	18.79(6.60)	-.037	-1.64
PS	6	.91	18.87(5.81)	.040	-1.50
BU	6	.72	20.84(5.31)	.118	-.461
SE	6	.87	19.51(4.98)	.023	-1.51
MD	6	.84	19.36(4.25)	.147	-.991
PRO	30	.84	97.38(5.18)	.467	2.570

Note= α=Cronbach alpha; M=mean, SD= standard deviation

Note: LC=lack of confidence, PW=positive beliefs about worry, CC=cognitive self-consciousness, NB=negative beliefs about danger, NC=need to control thoughts, MCT=metacognition, MN=novelty seeking MP=novelty producing, ME=engagement, MF=flexibility, SCM=socio cognitive mindfulness, CO=compassion satisfaction, PS=perceived support, BU=burnout, SE=secondary trauma stress, MD=moral distress, PRO=professional quality of life

According to Table 2, psychometric properties of the scales were explored in terms of reliability, descriptive statistics, and normality. The subscales of metacognition and professional quality of life were tested. The lack of confidence (LC) scale (M=14.36, SD=2.11) reported moderate internal consistency (α = .67). Positive beliefs about worry (PW) subscale (M= 15.44, SD= 5.46) showed good reliability (α = .93). Strong internal consistency was computed for cognitive self-consciousness (CC) subscale (M=13.98, SD=5.09) which was reported at α = .92. The negative beliefs about danger (NB) subscale (M=14.82, SD=5.46) demonstrated robust reliability (α = .93). Moreover, the need to control thoughts (NC) subscale (M=11.58, SD=4.15). The overall Metacognition total scale (MCT) scale (M=70.19, SD=19.41) demonstrated robust internal consistency (α = .96), indicating strong overall reliability of the construct. For socio-cognitive mindfulness, novelty seeking (MN) subscale (M=18.58, SD, 7.69) showed great reliability (α = .95). Novelty producing (MP) subscale (M=18.97, SD=7.74) also demonstrated excellent internal consistency (α = .96). The engagement (ME) subscale (M=14.70, SD= 6.11) yielded strong reliability (α = .94), while flexibility (MF) subscale (M=25.37, SD=11.82) reflected robust reliability (α = .96). Socio-Cognitive Mindfulness (SCM) total scale (M=77.87, SD=32.27) showed strong internal consistency (α = .98). For professional quality of life sub-scales, compassion satisfaction (CO) subscale (M =18.79, SD=6.60) showed strong internal consistency (α = .93). Perceived support (PS) subscale (M =18.87, SD=5.81) also showed high reliability (α = .91). The burnout (BU) subscale (M=20.84, SD=5.31) exhibited acceptable reliability (α = .72). Secondary traumatic stress (SE) subscale (M =19.51, SD=4.98) demonstrated good reliability (α = .87), while moral distress (MD) subscale (M=19.36, SD=4.25) showed adequate internal consistency (α = .84). The overall Professional Quality of Life (PRO) total scale (M =97.38, SD=5.18) demonstrated good overall reliability (α = .84). The skewness and kurtosis value were under acceptable limits that reflected approximate normal distributions. Any slight discrepancy related to the professional quality of life scale was met with Logarithm and Square Root commands(Noel et al., 2021). Overall, the scales exhibited fit psychometric properties suitable for parametric testing and further confirmed for moderation analyses.

3.2. Bivariate Analysis

The Pearson Product Moment Correlation Analysis showed that professional quality of life among hospital team members was significantly and positively associated with socio-cognitive mindfulness ($r = 0.35$, $p<0.001$) and metacognition factors that are: lack of confidence ($r=0.42, p<.001$), positive beliefs about worry($r=0.23, p<.001$), negative beliefs about danger of worry($r=0.44, p<.001$), cognitive, self-consciousness ($r=0.30, p<.001$) and

need to control thoughts(r=0.34, p<.001). Supported by evidence that effects of normality on bivariate correlation coefficients in psychology may persist for sample sizes of 250, 500, and 1000 (Ventura-León et al., 2023).

Table 3: Descriptive Statistics of main study variables (n=200)

Scale	*M*	*SD*	*Min*	*Max*
LC	14.3650	2.11046	9.00	20.00
PW	15.4400	5.46036	6.00	23.00
CC	13.9800	5.02952	6.00	24.00
NB	14.8200	5.46323	6.00	24.00
NC	11.5850	4.15803	5.00	20.00
MCT	70.1900	19.41982	40.00	98.00
MN	18.5800	7.69739	5.00	31.00
MP	18.9750	7.74171	7.00	35.00
ME	14.7005	6.11177	4.00	27.00
MF	25.3756	11.82444	7.00	44.00
SCM	77.8782	32.27758	34.00	123.00
CO	18.7950	6.60386	8.00	29.00
PS	18.8700	5.81396	9.00	29.00
BU	20.8450	5.31055	10.00	41.00
SE	19.5100	4.98842	10.00	28.00
MD	19.3600	4.25688	10.00	29.00
PRO	97.3800	5.18362	83.00	124.00

M=mean; SD= standard deviation, Min=minimum, Max=maximum

Note: LC=lack of confidence, PW=positive beliefs about worry, CC=cognitive self-consciousness, NB=negative beliefs about danger, NC=need to control thoughts, MCT=metacognition, MN=novelty seeking MP=novelty producing, ME=engagement, MF=flexibility, SCM=socio cognitive mindfulness, CO=compassion satisfaction, PS=perceived support, BU=burnout, SE=secondary trauma stress, MD=moral distress, PRO=professional quality of life

According to Table 3, the total mean scores for metacognition and subscales, along with socio-cognitive mindfulness and subscales, with professional quality of life subscales are listed. As drawn from the scores, lack of confidence (LC) reflects a medium to moderate value (M = 14.37, SD = 2.11), which indicates that participants may delve into doubts related to cognitive performances at the workplace. The positive beliefs about worry (PW) (M = 15.44, SD = 5.46) and negative beliefs about danger (NB) (M = 14.82, SD = 5.46) showed differences in variation, which may account for individual factors about rumination and its consequences at work. The subscales, cognitive self-consciousness (CC) (M = 13.98, SD = 5.03) and need to control thoughts (NC) (M = 11.59, SD = 4.16) showed medium to moderate mean values that indicate emerging abilities to control cognitive thought processes, which may or may not be accompanied by mindfulness. The overall metacognition (MCT) score was relatively high (M = 70.19, SD = 19.42), which indicates that there is pre-existing knowledge related to metacognitive skills in terms of higher-order thinking patterns in hospital staff. For socio-cognitive mindfulness, novelty seeking (MN) (M = 18.58, SD = 7.70) and novelty producing (MP) (M = 18.98, SD = 7.74) reflected moderate to high scores. This indicates the hospital staff members approach medical care mindfully, embracing uncertainty and novel situations every time with patients. engagement (ME) (M = 14.70, SD = 6.11) and flexibility (MF) (M = 25.38, SD = 11.82) demonstrated moderate to high mean scores with considerable dispersion, indicating innovative and adaptive processes among participants. The aggregate score for Socio-Cognitive Mindfulness (SCM) was moderately high (M = 77.88, SD = 32.28), which reflects higher underlying mindfulness levels, with fewer instances of mindlessness at work; yet it is subject to individual and situational variation. In terms of professional quality of life, compassion satisfaction (CO) (M = 18.80, SD = 6.60) and perceived support (PS) (M = 18.87, SD = 5.81) indicated moderate levels of positive occupational experiences. The health workers could practice soft skills at work. However, burnout (BU) (M = 20.85, SD = 5.31), secondary traumatic stress (SE) (M = 19.51, SD = 4.99), and moral distress (MD) (M = 19.36, SD = 4.26) were present at moderate levels, suggesting the presence of occupational stressors that can adversely affect professional well-being. Overall, the professional quality of life (PRO) score was moderate (M = 97.38, SD = 5.18), whereby negative experiences could undermine the overall well-being of health staff if not effectively managed through interventions.

3.3. Regression Analysis

Table 4 Three-step hierarchical multiple regression analysis testing the moderating effect of socio-cognitive mindfulness between metacognition scales of lack of confidence, positive beliefs about worry, negative beliefs about danger of worry, cognitive self-

consciousness and need to control thoughts with mean-centred interaction while controlling for demographic factors among hospital teams in Pakistan (n=200)

Table 4

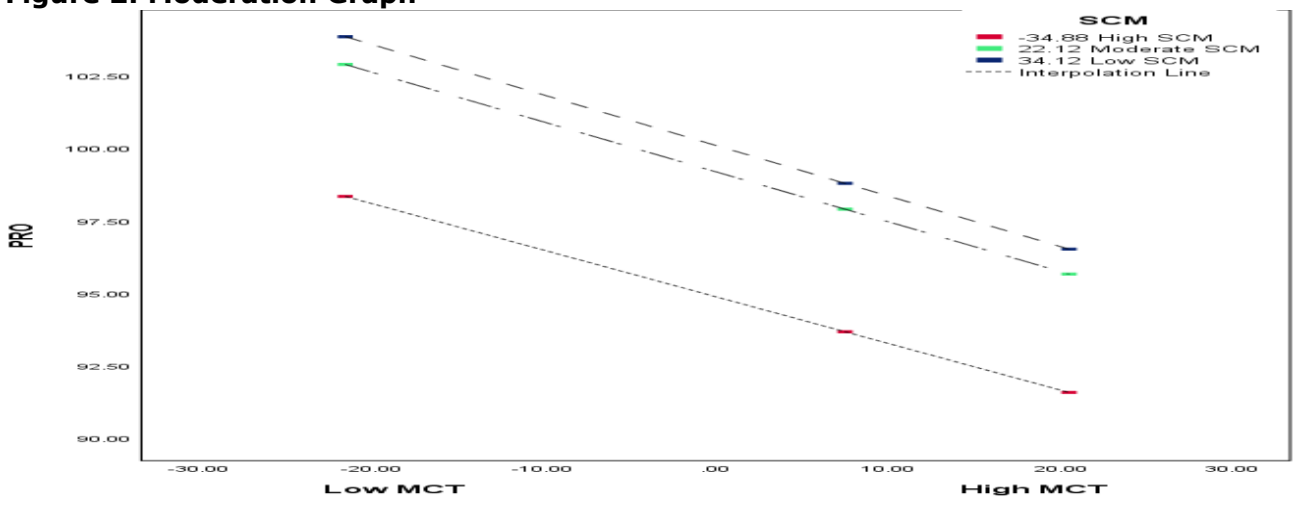
Variables	Model1		Model 2		Model 3	
	β	p-value	β	p-value	β	p-value
Gender	-.070	.349	-.046	.552	-.063	.412
Education	-.052	.620	-.060	.576	-.078	.462
Income	.146	.103	.133	.146	.155	.091
Marital status	-.066	.367	-.085	.255	-.093	.209
Working hours	.042	.574	.018	.814	.027	.717
religion	-.080	.261	-.055	.461	-.042	.572
Hospital member type	-.206	.048*	-.131	.235	-.160	.147
Age	-.149	.076	-.096	.262	-.125	.149
Experience	.038	.646	.009	.916	-.008	.923
Lack of confidence	-	-	-.137	.096	.370	.140
Positive beliefs about worry	-	-	-.299	.106	-.147	.021*
Cognitive self-consciousness	-	-	-.066	.719	-.443	.027*
Negative beliefs about the danger of worry	-	-	-.074	.661	-.013	.942
Need to control thoughts.	-	-	.017	.917	-.107	.032*
Metacognition	-	-	.022	.033	.066	.691
Socio-cognitive mindfulness	-	-	-	-	-	.006*
R^2	.082	F=1.846	.130	F=1.796	.146	F=1.926
Adjusted R^2	.037	<.001	.057	P<.001	.070	P<.001
R^2 change		-	.048	.038	.005	.021

Note: p-value is less than 0.05

Note: LC=lack of confidence, PW=positive beliefs about worry, CC=cognitive self-consciousness, NB=negative beliefs about danger, NC=need to control thoughts, MCT=metacognition, MN=novelty seeking MP=novelty producing, ME=engagement, MF=flexibility, SCM=socio cognitive mindfulness, CO=compassion satisfaction, PS=perceived support, BU=burnout, SE=secondary trauma stress, MD=moral distress, PRO=professional quality of life

A three-step hierarchical multiple regression analysis was conducted to examine whether socio-cognitive mindfulness moderates the relationship between metacognitive beliefs (lack of confidence, positive beliefs about worry, negative beliefs about danger of worry, cognitive self-consciousness, and need to control thoughts) and the outcome variable, while controlling for demographic characteristics (gender, education, income, marital status, working hours, religion, hospital member type, age, and work experience). The moderation graph is as Figure 2.

Figure 2: Moderation Graph



According to Table 4, the three-step hierarchical regression was computed. For the Model 1, demographic variables were entered in the block as control variables. It reflected a 8.2% of variance for professional quality of life, $R^2 = .082$, $F = 1.85$. If demographic factors are explored, only the hospital member type emerges as a significant predictor ($\beta = -.206$, $p = .048$), which means that metacognition and socio-cognitive mindfulness may have variation according to the hospital member types across hierarchies of doctors, nurses, allied health professionals, and administrative/support staff. Other demographic factors were non-significant ($p > .05$), as shown in Table 4. The table further lists different statistical values important for the interpretation. The main "R" value shows correlation between the observed and predicted values for professional quality of life. The higher values predict better prediction. The R-squared value reflects the proportion of variance in the professional quality of life explained by the predictors. The change in R-squared shows an increase in explained variance when a new block of variables is entered. The F value shows whether the regression model significantly predicts the outcome. A large F value with $p< .05$ indicates significance of the model. The change in F value shows whether new variables entered in the model improved it. In this case, mean-centric values of socio-cognitive mindfulness and metacognition improved the model. Moreover, the Beta standardized coefficient was used to show the relative strength of each predictor and allowed comparisons. The t-value shows whether each individual predictor significantly contributed to the model. Finally, p-values were used to test statistical significance. Furthermore, adjusted R-squared accounts for the number of predictors and sample size. The metrics of standard error reflect the precision of the coefficient estimate. Hence, the overall model showed incremental validity and justifies the order of variables entered in the model.

For the Model 2, the main effects of metacognitive belief variables and overall metacognition were added. This model explained an additional 4.8% of variance, $\Delta R^2 = .048$, resulting in a total R^2 of .130, $F = 1.80$. Although most metacognitive belief subscales did not show significant unique effects, overall metacognition was a significant predictor ($\beta = .022$, $p = .033$), indicating that higher levels of metacognition were associated with changes in the professional quality of life after controlling for demographics. In Model 3, the interaction term between socio-cognitive mindfulness and metacognition (mean-centred) was entered to test the moderation effect. The inclusion of the interaction term led to a further 2.1% increase in explained variance, $\Delta R^2 = .021$, yielding a total R^2 of .146, $F = 1.93$. The interaction effect was statistically significant ($\beta = .006$, $p < .05$), providing evidence that socio-cognitive mindfulness moderates the relationship between metacognition and the professional quality of life. Additionally, in the final model, several metacognitive belief subscales showed significant effects, including positive beliefs about worry ($\beta = -.147$, $p = .021$), cognitive self-consciousness ($\beta = -.443$, $p = .027$), and need to control thoughts ($\beta = -.107$, $p = .032$). These findings suggest that specific dysfunctional metacognitive beliefs contribute uniquely to the professional quality of life when the moderating role of socio-cognitive mindfulness is considered. Overall, the results support the hypothesised moderating role of socio-cognitive mindfulness, indicating that the strength of the relationship between metacognition and the professional quality of life varies as a function of individuals' levels of socio-cognitive mindfulness. Figure 2 further visually depicts the moderation of socio-cognitive mindfulness at high, moderate, and low levels between metacognition and professional quality of life. The strength of the relationship is examined through varying levels of socio-cognitive mindfulness, which depicts a significant moderation effect. Hospital team members' socio-cognitive mindfulness moderates the relationship between metacognition and professional quality of life, such that higher levels of socio-cognitive mindfulness can reduce any negative factors of metacognition (such as lack of confidence in memory) on positive aspects of professional quality of life outcomes (such as compassion satisfaction and perceived support). Hence, hospital team members with higher socio-cognitive mindfulness maintain a better quality of life as metacognition improves.

4. Discussion

This research aimed to study the moderating effect of socio-cognitive mindfulness between metacognition and professional quality of life in hospital teams. The research shows that socio-cognitive mindfulness in terms of novelty seeking, novelty producing, engagement, and flexibility at hospital premises is integral. Socio-cognitive mindfulness effectively buffers the relation between metacognition and related factors and with professional quality of life; for the health workers who are at risk of burnout, suffer secondary trauma stress, and are morally

distressed. Overall, the hospital team members demonstrated moderate to high levels of underlying metacognition and socio-cognitive mindfulness, alongside a generally favourable level of professional quality of life (Ababneh & Zeilani, 2025). However, the scores can be improved through the intervention of mindfulness-based courses and programs. According to descriptive findings, hospital team members had metacognitive awareness, yet they also exhibited dysfunctional beliefs, rumination, and negative thoughts regarding uncontrollability and danger of worry (Bahari et al., 2022). Similarly, socio-cognitive mindfulness at preexisting levels is moderate in terms of novelty, engagement, and cognitive flexibility; yet variability in scores is observed (Shi et al., 2023). According to the different professional roles, doctors, nurses, allied health professionals, and administrative staff may respond differently to the factors. Nurses may report higher levels of burnout, secondary trauma stress, and moral distress as compared to peers (Epstein et al., 2020). Doctors and physicians may report more compassion fatigue and have greater chances of perceived support than allied health professionals (McGrath, Matthews, & Heard, 2022). Moreover, moderate values of compassion satisfaction and perceived support were observed in regard to higher levels of burnout, secondary trauma stress, and moral distress. (Rayani et al., 2024). This indicates the underlying occupational stressors that may add to psychological strain for staff in healthcare environments (Kotera, 2021).

The hierarchical regression also supports the moderating role of socio-cognitive mindfulness between metacognition and professional quality of life. Metacognition emerged as a significant predictor. Moreover, the significant interaction between socio-cognitive mindfulness and metacognition shows that effect of metacognitive skills on professional quality of life is subject to variation depending on socio-cognitive mindfulness scores of hospital staff members (Mansueto et al., 2024). Any adverse effects of dysfunctional metacognitive beliefs, such that of negative beliefs about the uncontrollability of worry and the need to control thoughts, were associated with professional quality of life as per the moderation model. If mindfulness is inculcated, it leads to non-reactivity, lower stress, improved cognitive process, and decreased instances of constant rumination (Chahine et al., 2023). Hence, hospital team members who report better metacognition have an improved state of socio-cognitive mindfulness, which ultimately improves the professional quality of life in hospital team members (Church & Carroll, 2023). It is important to note that socio-cognitive mindfulness can reduce anxiety, depression, and burnout, and increase self-compassion that may sustain for 12-months post- intervention from taking a mindfulness course or a program (Burton et al., 2017; Luberto et al., 2017; Quiroz-González et al., 2024). The study includes the niche sample of support staff and allied health professionals who can also benefit from mindfulness programs (Ducar et al., 2020). Although socio-cognitive mindfulness has a significant moderating role, there is a challenge in the implementation of mindfulness-based courses and programs that can be launched across hospitals' hierarchy (Knudsen et al., 2024).

Consequently, the finding indicates the importance of socio-cognitive mindfulness as a protective regulatory mechanism that shapes positive metacognitive beliefs to improve professional quality of life. The efficacy of brief 5-week course-based mindfulness programs has shown potential results in hospital settings, which can be introduced at the management level (Luberto et al., 2017; Watanabe et al., 2019). This study design carries limitations. The causality cannot be confirmed. Moreover, there can be confounding variables' impacts, such as individual psychological factors and personality traits. Self-report questionnaires are used, which may pose a risk of biases (Kotera, 2021). Moreover, two main hospitals from Lahore city were taken, which can limit generalizability, yet workers from all over Pakistan worked in the hospitals and comprised the sample. Yet the study strengths include the Pakistani hospital team members' sample, which is under-researched in mindfulness-based studies. Moreover, further interventional and longitudinal studies must be undertaken in the Pakistani context to validate mindfulness programs in healthcare settings.

4.1. Data Availability Statement

The dataset is available upon request from the corresponding author.

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