

Psychological flexibility and work engagement among Chinese nurses: Mediating role of self-compassion and negative emotions

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Abstract

Background: Work engagement affects nurses' job performance and the quality of nursing. The question of how to enhance the level of work engagement has received more attention in the health care sector. Psychological flexibility, self-compassion, and emotions may be useful for improving work engagement. The purpose of this study is to analyse the mediating effects of self-compassion and negative emotions between psychological flexibility and work engagement of Chinese nurses during infectious disease pandemics.

Methods: A cross-sectional study was conducted with 1,569 Chinese nurses. Structural equation modelling (SEM) was used to determine the mediating effect of self-compassion and negative emotions on the relationship between psychological flexibility and work engagement.

Results: Work engagement was inversely connected with psychological flexibility ($r = -0.251, P < 0.001$). Self-compassion and negative emotions played a partially mediating role on the associations of psychological flexibility with work engagement ($\beta_1 = -0.021, \beta_2 = -0.044$).

Conclusion: Hospital administrators should develop concrete measures that incorporate negative emotions and self-compassion in interventions targeting psychological flexibility, which may enhance the level of work engagement during infectious disease pandemics.

Introduction

In various regions across the world, the number of coronavirus disease 2019 (COVID-19) cases since the beginning of 2020 has been increasing. Previous studies have shown that medical workers have faced varying degrees of psychological distress during infectious disease epidemics (1). Working in various stressful situations may develop negative emotions, or even influence work efficiency, among healthcare workers. Regarding the aspects associated with psychosocial work environment, the ability to engage in tasks that require cognitive and emotional processing can result in psychosocial changes among individuals in various work environments (2). Previous studies on the aforementioned topics have established that stress and anxiety can affect the work engagement and productivity levels (3, 4). Various scholars have conducted pilot studies on enhancing psychological resilience and flexibility among workers, intending to enhance their work engagement levels (5).

Psychological flexibility is an important component of psychological health (6). It refers to an individual's ability to maintain conscious contact with the present situation flexibly and autonomously, depending on the conditions associated with the actual environment and according to their values. Psychological flexibility is the core concept of acceptance and commitment therapy (ACT). Previous studies have shown that the degree of an individual's perception of stress can affect their psychological flexibility levels. For example, among adults, there exists a significant correlation between perceived stress and psychological flexibility (7). Psychological flexibility can also affect mental health. For example, experiential avoidance can exacerbate depression among patients with migraine (8).

Various studies have shown that psychological flexibility is also effective in the field of occupational health. For instance, several studies have applied the psychological flexibility scale (9) to health care environments (10, 11). The findings obtained in such studies suggest that psychological flexibility is positively associated with workplace functions, such as work engagement, which is a positive and satisfying emotion interrelated to an individual's work and cognitive status; this reflects high energy levels, enthusiasm, focus at work, and a strong sense of commitment (12). Various systematic reviews regarding work engagement in the nursing field have been conducted (13–16). Such studies show that high work engagement levels are conducive to the improvement of employees' job performance. Another point of interest is that enhanced nurses' work engagement can improve the quality of nursing and ensure patient safety (17). Essentially, extensive research has established that psychological flexibility plays a key role in improving work engagement levels. However, to our knowledge, such studies rarely involve nurses, let alone during infectious disease pandemics. Therefore, it is necessary to investigate the above relationship among Chinese nurses during infectious disease pandemics.

Furthermore, the mechanisms of this relationship remain unclear. Some previous studies show that psychological flexibility can significantly affect the prevalence of negative emotions, which can be addressed through counselling on psychological flexibility, thereby improving the final outcome (18, 19). Another study proved a statistically significant relationship between self-compassion and negative emotions (20). According to this study, high levels of self-compassion can be used to protect individuals during negative life events, reduce individuals' attacks on self, and avoid excessive thinking about negative life events, thereby having positive impacts on individuals' psychological functions (21). The regulation of negative emotions seems to be significantly linked to work engagement levels. Furthermore, existing studies focus on employees and patients, whereas nurses are rarely used as study subjects.

Accordingly, our study aimed to characterise the association of psychological flexibility, self-compassion, negative emotions and work engagement among Chinese nurses during infectious disease pandemics. We hypothesised that psychological flexibility level is positively correlation with the degree of work engagement, and such association is partially mediated by the negative relationship between psychological flexibility and negative emotions, and the positive relationship between psychological flexibility and self-compassion. The hypothetical model we developed is shown in Fig. 1.

Methods

Participants

This cross-sectional study was conducted in the First Affiliated Hospital of Xinxiang Medical College in Henan province using convenience sampling in July 2021. The participants were those who were currently performing the nursing job during the study and possessed a nurse qualification certificate. Moreover, we excluded other medical professionals, such as doctors. A total of 1,700 nurses completed a questionnaire survey. Finally, we excluded 131 entries on account of missing data, leaving 1,569 nurses in the sample.

Measurements

Assessment of psychological flexibility

The most prominent aspects (cognitive diffusion and experiential avoidance) were used to evaluate the negative features of psychological flexibility (22) {Yasinski, 2020 #16}. The Cognitive Fusion Questionnaire (CFQ) and the Acceptance and Action Questionnaire version 2 (AAQ-II) were administered to all the participants. The higher the scores on these scales, the lower the level of psychological flexibility, thereby suggesting psychological inflexibility.

Cognitive Fusion Questionnaire

The Chinese version of the CFQ (23) was used in this study, which was originally compiled by Gillanders et al (24). It comprises nine questions with a range of 0 to 6 (0 = "never" to 6 = "always"). The higher score expressed higher cognitive integration level. The Cronbach's alpha of the questionnaire was 0.92, in addition the test-retest reliability was 0.67. In this study, the CFQ's Cronbach's alpha was 0.97.

Acceptance and Action Questionnaire-II

The Chinese version of the AAQ-II was used to evaluate avoidance behaviour (25), the measure was originally developed by Bond et al. (9). The questionnaire comprises seven items with a 7-point Likert scale. The higher score reflected higher avoidance behaviour level, thereby suggesting decreased psychological flexibility levels. Previous studies have established that the AAQ-II Cronbach's alpha was 0.84 and test-retest reliability was 0.81. In this study, the AAQ-II's Cronbach's alpha was 0.94.

Depression-Anxiety-Stress Scale

We used the Depression, Anxiety and Stress Scale – 21 Items (DASS-21) (26) to assess the experienced degree of negative emotions. Each dimension comprises seven questions with a range of 0 to 3 (0 = "does not meet with" to 3 = "always in line with"). Higher scores indicate more negative emotions.

The Chinese edition of the DASS-21 has been established as a trustworthy and valid measurement (27, 28). The reported Cronbach's alpha was 0.912, in addition the retest reliability was 0.751 (29). In our study, the Cronbach's alpha of this questionnaire was 0.93.

Self-Compassion Scale

Self-compassion was assessed using the Chinese version of the Self-Compassion Scale (SCS) originally developed by Neff (30). The Cronbach's alpha was 0.84, in addition the retest reliability was 0.89 (20). The 26-item scale is subdivided into six components: self-kindness, self-judgement, common humanity, isolation, mindfulness, and over-identification. Each item was assessed on a 5-point Likert scale by the participants. High scores indicated high levels of participants' self-compassion and low levels of negative emotions. The Cronbach's alpha was 0.85 for the SCS in our investigation.

Utrecht Work Engagement Scale

Work engagement was evaluated using the modified Chinese version of the Utrecht Work Engagement Scale (UWES)(31), which was initially developed by Schaufeli and Bakker (32). It contains 16 items with three subscale measures, including vigour, dedication, and absorption. Each items score ranges from 0-4. The Cronbach's alpha was 0.90. In our study, the UWES's Cronbach's alpha was 0.88.

Demographic Information

The demographic variables contained gender, age, education, marital status, number of children, nursing profession year, sleep quality, physical exercise, participation in emotion management training, and attendance of nurses' self-compassion training.

Statistical Analysis

SPSS 20.0 and AMOS 23.0 were used to analyse. We calculated the descriptive statistics, including numbers and percentages for the sociodemographic characteristics of respondents and the mean as well as standard deviations for participants' psychological flexibility, negative emotions, self-compassion, and work engagement. To examine the associations between the variables, Pearson's correlation analysis was performed. SEM was used to test the mediation model, with psychological flexibility (PGF) as the independent variables, UWES as the dependent variables, and using the DASS-21 and SCS as the mediating variables.

Results

Demographic Characteristics of the Sample used for the Study

The statistical description of the participant's demographics and the descriptive statistics for all the assessed variables are listed in Table 1 (at the end of the article). There were 1,569 subjects enrolled in this study, including 1,505 females (95.90%) and 64 males. The participants' mean age is 32.60 (\pm 7.01) years. Most of the participants are married (74.60%), have a bachelor's degree (83.70%), have at least one child (43.00%), have a nursing experience of 6–10 years (31.00%), and have never participated in emotion and self-compassion management training (64.1 and 49.1%, respectively).

Table 1
Demographic characteristics of the sample used in this study

Characteristics	Total sample (N= 1569)
Female, n (%)	1505 (95.90)
Age, mean (SD) [range]	32.60 (7.01) [21–55]
Education, n (%)	
Some college	247 (15.80)
Undergraduate	1313 (83.70)
Postgraduate	9 (0.60)
Marital status, n (%)	
Unmarried	372 (23.70)
Married	1171(74.60)
Divorced	22(1.40)
Widowed	4(0.30)
Number of children, n (%)	
0	478(30.50)
1	674(43.00)
2	414(26.40)
≥ 3	2(0.10)
Nursing profession years, n (%)	
≤ 5	439(27.90)
6–10	487(31.00)
11–15	374(23.80)
≥ 16	269(17.10)
Sleep quality, n (%)	
Excellent	42(2.70)
Good	269(17.10)
Fair	854(54.40)

Abbreviations: PGF, psychological flexibility score; UWES, work engagement; SCS, self-compassion; DASS-21, negative emotions.

Characteristics	Total sample (N= 1569)
Poor	325(20.70)
Very poor	79(5.00)
Physical exercise, n (%)	
Usually	107(6.80)
Sometimes	266(17.00)
Occasionally	741(47.2)
Never	455(29.0)
Participate in emotion management training, n (%)	
Usually	9(0.60)
Sometimes	150(9.60)
Occasionally	404(25.70)
Never	1006(64.10)
Attend nurse self-compassion training, n (%)	
Usually	24(1.50)
Sometimes	216(13.80)
Occasionally	559(35.60)
Never	770(49.10)
PGF, mean (SD) [range]	46.14(16.63)[16–112]
UWES, mean (SD) [range]	53.37(6.44)[16–80]
SCS, mean (SD) [range]	72.45(8.08)[26–130]
DASS-21, mean (SD) [range]	32.00(8.13)[21–84]
Abbreviations: PGF, psychological flexibility score; UWES, work engagement; SCS, self-compassion; DASS-21, negative emotions.	

Correlations between Variables

For the variables used in this study, the correlation matrix is shown in Table 2. All the variables were fit into a normal distribution, with a skewness from - 0.390 to 0.4 (below the absolute value of 3) and kurtosis from - 1.016 to -0.294 (below the absolute value of 8). All the associations are statistically significant ($P<0.01$). Specifically, work engagement is negatively correlated with the psychological

flexibility scores (CFQ-F and AAQ-II score), self-compassion, and negative emotions ($P < 0.001$). The higher the CFQ-F and AAQ-II scale score, the lower the level of psychological flexibility. Therefore, psychological flexibility levels are negatively related on self-compassion and negative emotions, but positively interrelated with work engagement.

Table 2
Correlation matrix for the study variables

Variables	1	2	3	4
1. PGF	–			
2. DASS-21	.652**	–		
3. SCS	.470**	.522**	–	
4. UWES	–.251**	–.306**	–.239**	–
Skewness	-0.390	0.400	-0.374	-0.188
Kurtosis	-1.016	-0.875	-0.363	-0.294
Notes: * $P < 0.05$; ** $P < 0.01$.				

Measurement Model

The effectiveness of the complete proposed model was verified using all the variables in confirmatory factor analysis. Three items have been removed from SCS owing to their poor factor loading (below 0.6), which is consistent with the scales used in previous studies (33). After taking the measures mentioned above, the model had an adequate model fitness (34). The Chi-square/df = 4.697, RMSEA = 0.049, GFI = 0.980, SRMR = 0.037, and CFI = 0.987. Furthermore, the convergent and discriminant validities are presented in Tables 3 and 4 (35, 36). The values of average value extracted (AVE) (0.598–0.860) and composite reliability CR (0.816–0.925) satisfy the cut-off threshold for convergent validity (Table 3) (35). Moreover, all square roots for AVE are greater than the correlation between the corresponding variables in Table 4, meaning that discriminant validity is established for the scales. The values of the variance inflation factor are below 10 (1.433–1.942), thereby showing no multicollinearity issues in this study.

Table 3
Construct validity

Construct	Dimension number	Estimate	AVE	CR
PGF	CFQ-F	0.901	0.860	0.925
	AAQ-II	0.953		
DASS-21	Stress	0.909	0.798	0.922
	Anxiety	0.892		
	Depression	0.878		
SCS	Self-Kindness	0.815	0.641	0.841
	Common Humanity	0.662		
	Mindfulness	0.906		
UWES	Vigour	0.704	0.598	0.816
	Dedication	0.839		
	Absorption	0.770		

Table 4
Discriminatory validity

	PGF	SCS	DASS-21	UWES
PGF	0.860			
SCS	0.528 ^{***}	0.641		
DASS-21	0.097 ^{***}	0.168 ^{***}	0.798	
UWES	0.011 ^{***}	0.023 ^{***}	0.032 ^{***}	0.598
AVE-square root	0.927	0.801	0.893	0.773
Notes: ^{***} P < 0.001: The diagonal line represents the amount of variance variation extracted for AVE evaluation.				

Structural Model

We used SEM to determine the mediating effect of SCS and DASS-21 on the relationship between PGF and UWES (Fig. 2). The fit indices of the SEM were Chi-square/df = 1.631, CFI = 0.999, GFI = 0.996, AGFI = 0.988, RMSEA = 0.020, and SRMR = 0.009, indicating that the mediating test was acceptable.

As shown in Table 5, we established that PGF directly affects SCS and DASS-21, both of which directly affect work engagement UWES, and the direct connection between PGF and UWES is statistically significant ($\beta = -0.298$, $P < 0.05$).

Notably, Table 6 shows that SCS and DASS-21 mediate a portion of the association between PGF and UWES, the mediating force is -0.021 and -0.044, respectively. The results of Table 6 show 95% confidence intervals, thereby showing that the indirect path coefficient is significant.

Table 5
Regression results of the structural model

Effect	Path	Standard path loadings	Standard error	t-value	P-value
Direct	PGF→SCS	0.256	0.065	8.305	0.000
	PGF→DASS-21	0.711	0.067	30.497	0.000
	SCS→UWES	-0.218	0.006	-6.774	0.000
	DASS-21→UWES	-0.162	0.006	-3.874	0.000
	PGF→UWES	-0.298	-0.054	-2.129	0.033

Table 6
Standardised mediation effects

Effect	Path	Estimate	P-value	95% Bias-corrected CI	
Indirect	PGF→SCS→UWES	-0.021	0.001	-0.032	-0.014
	PGF→DASS-21→UWES	-0.044	0.001	-0.067	-0.021
Total direct		-0.180	0.002	-0.286	-0.068

Discussion

In previous studies, the mediating relationship of self-compassion and negative emotions with psychological flexibility and work engagement was not confirmed among Chinese nurses, who may be exposed to more occupational stress during infectious disease pandemics. Our study found that psychological flexibility was negatively correlated with work engagement and that self-compassion and negative emotions played a partially mediating role in the associations of psychological flexibility with work engagement.

This study established that higher psychological flexibility levels can directly result in higher work engagement levels among nurses who deal with the COVID-19 situation in Xinxiang City, China. This finding confirmed existing studies suggesting that high psychological flexibility levels have a positive effect on workplace functions, such as work engagement (10, 11, 37). A recent study among physicians

that did not include specialists (38) also found that psychological flexibility positively affects work engagement. According to ACT, it may be a meaningful and effective target for therapies aiming at enhancing work engagement levels. Psychological flexibility has a specific effect on the level of work engagement (39), and the magnitude of its effect may be related to the degree of intervention required to ensure enhanced psychological flexibility. Therefore, under the pressure of the epidemic, nurses must not only take measures to give up the use of evaluative and absolute language to process epidemic information but must also accept various negative experiences due to the epidemic. This psychological process is more effective in buffering the pressure of the epidemic and increasing work engagement.

Our analyses revealed that nurses who reported high psychological flexibility levels (low CFQ-F and AAQ-II scores) tended to have high work engagement levels, and these aspects are associated with lower self-compassion and negative emotions. This proves that negative emotions may underlie low work engagement levels (40, 41). These findings are similar to those of previous studies suggesting that emotions intervene the association between psychological flexibility and final outcome (18, 19). Individuals with psychological inflexibility tend to adopt rigid interpretations and coping styles for negative events, and are more likely to fall into rumination (42) and adopt internal, stable, and universal attributions to explain negative events (43). According to ACT, various treatment studies targeting mood or anxiety disorders partially mediate the outcomes stemming from psychological flexibility measures(44). Therefore, individuals with higher psychological flexibility levels might pay more attention to the regulation of their emotions (45), and can let down their defences in the current situation, thereby allowing them to feel and experience their current thoughts and feelings. This means that nurses with psychological flexibility have a high possibility of experiencing lower levels of negative emotions.

The final models revealed that high psychological flexibility levels result in the reduction of the degree of self-compassion, which we had not hypothesised in this study. Therefore, self-compassion significantly plays a mediating role on psychological flexibility and work engagement. The present study's result is as opposed to the outcomes of existing study conducted on the inhabitants of Poland, which have established significantly positive links between psychological flexibility and self-compassion (46). One possible explanation for this inconsistency is that nurses in this study needed to deal with a more urgent situation i.e., infectious disease epidemics, which means that they had less related experience and cognitive integration, thereby reducing the attention on self-thought and reducing the degree of self-compassion. Therefore, further studies are required to examine this unexpected result.

Limitations

The current study includes a number of limitations. First, our research design was cross-sectional. A longitudinal design concerned with the enhancement of psychological flexibility and work engagement is necessary to provide an evaluation of causal relationships among the variables studied. Second, the CFQ and the AAQ-II were used to evaluate the negative features of psychological flexibility, whereas recent studies argue for the use of broader and multidimensional conceptualisations of the construct (47). Relevant scales may be considered in future studies. Finally, we evaluated the mediating role of negative

emotions and self-compassion, whereas many nurses have other mental health problems, which should be considered in future studies.

Conclusions And Implications To Practice

The present study provides insights into the relationship between psychological flexibility, negative emotions, self-compassion, and work engagement through the examination of a large sample of nurses who suffer from the challenges associated with COVID-19 cases in China, and guides the intervention measures by ACT to enhance work engagement of nurses during infectious disease pandemics. Accordingly, although psychological flexibility may be the focus of interventions aimed at enhancing work engagement, our study suggests that the regulation of emotions could improve the vitality, dedication, and concentration of nurses in their practical workplaces. The results of this study provide valuable guidance and a practical basis for hospital managers and nurses themselves on how to improve the work engagement level of nurses during special periods.

Abbreviations

SEM: Structural Equation Modelling

COVID-19: Coronavirus Disease 2019

ACT: Acceptance and Commitment Therapy

CFQ: Cognitive Fusion Questionnaire

AAQ-II: Acceptance and Action Questionnaire version 2

DASS-21: Depression, Anxiety and Stress Scale–21 Items

SCS: Self-Compassion Scale

UWES: Utrecht Work Engagement Scale

PGF: psychological flexibility

AVE: average value extracted

Declarations

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Contributions

Yan Yang, Anna Ma, Hongjuan Chang carried out the studies, participated in collecting data, and drafted the manuscript. Yan Yang, Lina Wang performed the statistical analysis and participated in its design. Meng Yao Xie and Han Chen participated in the acquisition, analysis, or interpretation of the data. All authors read and approved the final manuscript.

Ethical declarations

The Ethics Committee of Xinxiang Medical University approved the present study (XYLL-2018S011). All methods of this work were carried out in accordance with approved guidelines and the Declaration of Helsinki. Nurses signed their written informed consent and their anonymity is preserved in this study.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used or analysed during the current study are available from the corresponding author on reasonable request.

Competing Interest

The authors declare that they have no competing of interests.

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Figures

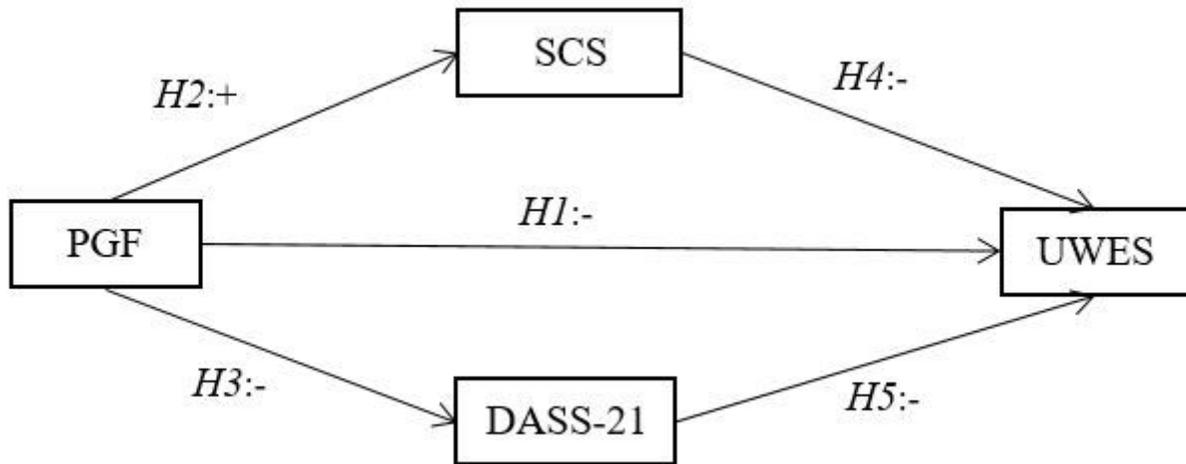


Figure 1

Hypothesized model of relationships among psychological flexibility, self-compassion, negative emotions and work engagement.

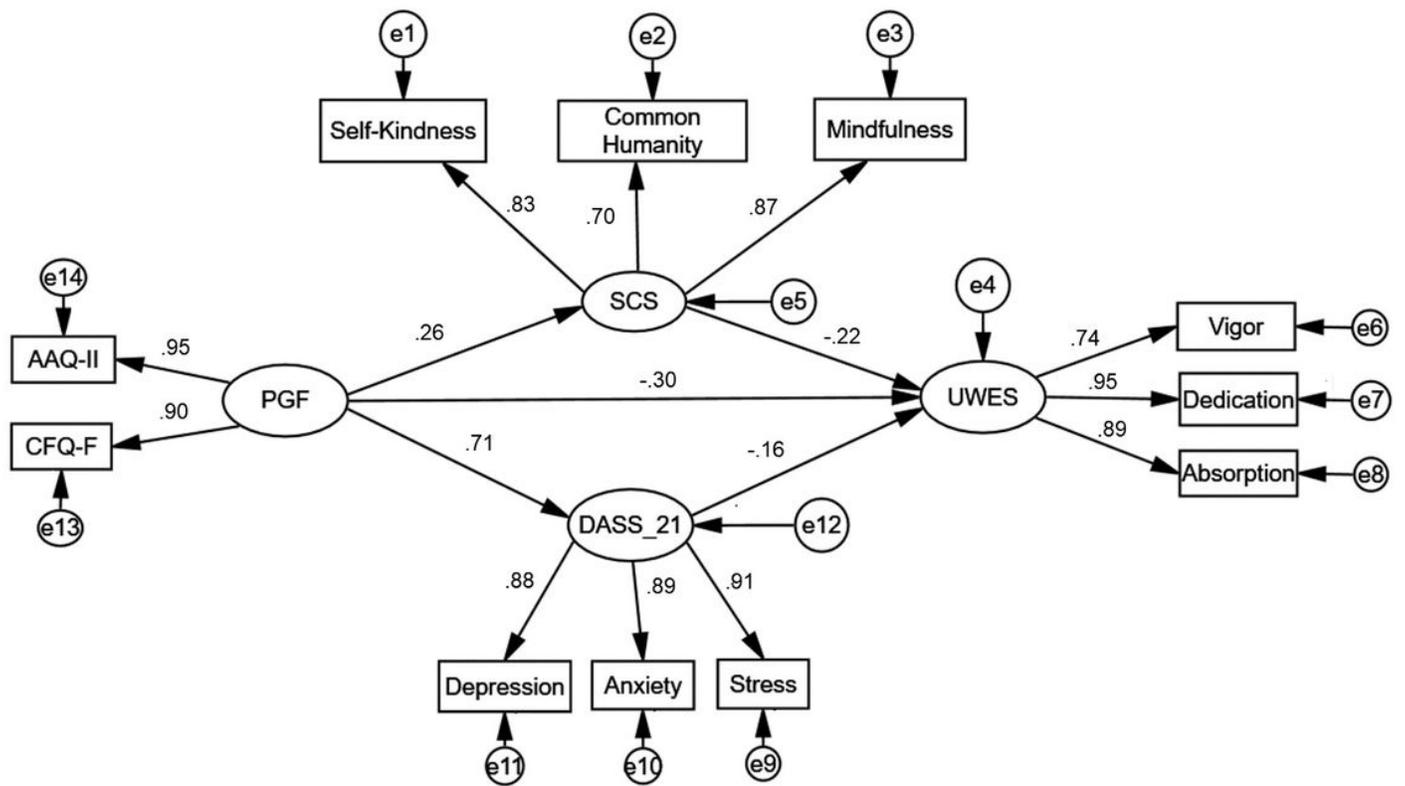


Figure 2

Model chart of mediation of self-compassion and negative emotions on the relationship between psychological flexibility and work engagement.