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# Impact of Psychological Distress on Success of Information Technology Projects in Pakistan: The Role of Work Engagement

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## Abstract

This study focuses on success of IT projects in Pakistan because of the significant impact that it has on helping Pakistan gain its competitive edge in the world. By considering the social-cultural side of IT projects and its impact on project success this study focuses on understanding the indirect relationship between psychological distress and project success with work engagement playing the role of a mediator and leader-member exchange playing the role of moderator between psychological distress and work engagement to increase project success ratio. Using snowball sampling, data was collected from 181 respondents across Pakistan. Our findings suggested that work engagement does play the role of mediator as it has a negative relationship with psychological distress but a positive relation with project success and that in IT industry of Pakistan leader-member exchange doesn't moderates the negative impact of psychological distress on work engagement.

## Introduction

With the world rapidly evolving into a global village, Information Technology (IT) has become a central pillar in driving globalization, economic growth, and organizational transformation. The seamless integration of digital technologies has enabled unrestricted movement of information and resources across borders, reshaping how societies, economies, and cultures interact (Hofmann, 2013; Shilenge & Telukdarie, 2022). As of Q4 2023, approximately 5.30 billion people—65.7% of the global population—were using the internet, highlighting the scale of digital connectivity (Reportal, 2023). This digital revolution has not only enhanced communication and trade but has also become a key determinant of national development and competitiveness (Castells, 2011; Dollar & Kraay, 2004; Prasad, Rogoff, Wei, & Kose, 2003; WTO, 2020). In Pakistan, the IT sector has emerged as a vital contributor to economic progress. The country has strategically shifted from IT manufacturing to IT services, aiming to boost GDP, create employment, and strengthen its global standing (Garrett, 2000; Vincenzo, 2018). According to the State Bank of Pakistan, the IT industry is the largest net service exporter, and the Pakistan Board of Investment projects the sector to reach a value of $20 billion under Vision 2025 (Investment, 2023). However, despite its potential, the IT industry faces significant challenges—particularly in project execution. The Standish Group's CHAOS Report (2020) reveals that only 10% of IT projects are successful, while 66% either partially or completely fail. While technical and managerial factors have been widely studied, the human element—especially the psychological wellbeing of IT professionals—remains underexplored. IT professionals often operate in high-pressure environments, facing constant demands for innovation, adaptability, and precision. According to Computerworld magazine's job satisfaction survey, IT professionals rank their jobs among the most stressful (Love & Irani, 2007), and few professions demand as much cognitive and emotional effort (Kaluzniacky, 1998). This intense work culture has led to rising levels of psychological distress, which can

negatively impact employee engagement, interpersonal relationships, and overall productivity (Caveen, Dewa, & Goering, 2007; Kircanski, Joormann, & Gotlib, 2012; Montano, Reeske, Franke, & Hüffmeier, 2017; Shain, Arnold, & GermAnn, 2012).

The purpose of this study is to investigate the impact of psychological distress on project success in Pakistan's IT sector. Specifically, it explores how psychological distress affects **work engagement**, and how this, in turn, influences project outcomes. Given that a healthy mindset is a critical asset in the IT industry, understanding this relationship is essential. Research shows that improved mental health leads to better work performance and a more positive attitude toward work (Ford, Cerasoli, Higgins, & Decesare, 2011), while distress can result in low morale and project inefficiency. This study also introduces **Leader-Member Exchange (LMX)** as a psychological resource that may buffer the negative effects of distress. By examining the mediating role of work engagement and the moderating role of LMX, the research aims to provide a more holistic understanding of project success in the IT industry. From a **theoretical perspective**, this study addresses a critical gap in the literature by exploring the psychological and social dimensions of project management. It contributes to the understanding of how work engagement mediates the relationship between psychological distress and project success, and how LMX can serve as a mitigating factor (Wu, Hu, & Zheng, 2019; Michaelis, Stegmaier, & Sonntag, 2009; Mubarak et al., 2022). From a **practical standpoint**, the findings can help organizations foster healthier, more engaged work environments, reduce project failure rates, and enhance overall productivity. These insights are not only valuable for the IT industry but may also be applicable to other high-pressure sectors, contributing to broader efforts to improve employee wellbeing and organizational performance.

**Problem Statement**

Despite the growing importance of the Information Technology (IT) sector in driving Pakistan's economic growth and its emergence as the country's largest net service exporter, a significant proportion of IT projects continue to fail. With only 10% of IT projects deemed successful and 66% either partially or completely failing (Standish Group, 2020), there is an urgent need to understand the underlying factors contributing to these outcomes. One critical yet underexplored factor is the psychological distress experienced by IT professionals, which negatively affects their productivity, engagement, and overall project performance. Rising turnover rates, absenteeism, and mental health challenges among IT personnel highlight the need for deeper investigation into how psychological distress impacts project success. This study aims to examine this relationship, with a particular focus on the mediating role of work engagement and the moderating effect of leader-member exchange as a psychological resource.

**Gap Analysis:**

The relation between psychological distress and Project success has been studied before but this study contributes to the literature on impact of psychological distress impact on project success in these two ways:

***Project's as Social Systems:***

It is to be noted that still social relationships and behavior of people involved in completion of a project are quite crucial factors impacting project success and it is not studied up to its full extent due to restricted understanding on projects as intricate social systems (Bresnen, Edelman, Newell, Scarbrough, & Swan, 2005; Shahzad, Iqbal, Nauman, Shahzadi, & Luqman, 2023; Unterhitzenberger & Bryde, 2019) . And this study aims to investigate this relationship between psychological distress and project success as a social system, where it was assumed that due to psychological distress (that can be caused by any internal or external factor) impacts the work engagement of an employee which in turns impacts the project success.

***Addition of Psychological Resource:***
Combining the two gaps recommended by Namra in her research that relation of leaders with subordinates plays an important role in their job performance (Wu, Hu, & Zheng, 2019) and it was recommended that impact of project manager's behavior on employees be studied (Mubarak et al., 2022). Then in addition to this it was recommended to study impact of another psychological resource between psychological distress and project success relationship (Michaelis, Stegmaier, & Sonntag, 2009; Mubarak et al., 2022).

**Research Questions:**
Q1. How does psychological distress impact work engagement among employees in the IT sector of Pakistan?
Q2. How does work engagement impact project success among employees in the IT sector of Pakistan?
Q3. Does work engagement mediate the relationship between psychological distress and project success?
Q4. Does leader-member exchange moderates the relationship between psychological distress and work engagement such that it will decrease their impact on one another?

**Objectives:**
1. To investigate the impact of psychological distress on work engagement among employees in the IT sector of Pakistan.
2. To investigate the impact of Work engagement on Project Success among employees in the IT sector of Pakistan.
3. To examine the mediating role of work engagement between psychological distress and project success among employees in the IT sector of Pakistan.
4. To investigate the moderating effect of leader-member exchange between psychological distress and work engagement of IT sector of Pakistan.

**Interplay Between Psychological Distress and Work Engagement**
In the increasingly competitive and fast-paced IT industry of Pakistan—one of the top global exporters of IT services (Gul et al., 2023; Mustafa & Hussain, 2023)—employees face intense job demands. These demands, when not matched with adequate resources, lead to psychological distress, which includes symptoms such as anxiety, hopelessness, and emotional exhaustion (Anasori et al., 2021; Fordjour et al., 2020). According to the Stress Process of the Job-Demand Resource (JD-R) model (Dollard et al., 2012), such imbalance results in mental fatigue and poor work performance. Work engagement, defined by vigor, dedication, and absorption (Schaufeli, 2013; Mazzetti et al., 2023), is a key indicator of mental wellness and job involvement. Psychological distress undermines these dimensions, reducing an employee's ability to stay focused and committed (Adanaqué-Bravo et al., 2023).

**Interplay Between Work Engagement and Project Success**
Project success is a multidimensional construct encompassing timely delivery, budget adherence, stakeholder satisfaction, and long-term impact (Baccarini, 1999; Turner & Zolin, 2012). In Pakistan's IT sector, where project success is vital for maintaining global competitiveness (Telecommunication, 2020), employee performance plays a crucial role. According to the Motivational Process of the JD-R model increased job resources—such as engagement—lead to improved performance and organizational commitment. Engaged employees demonstrate higher resilience, focus, and quality of work (Rich et al., 2010; Schaufeli et al., 2009), which directly contributes to project success (Wickramasinghe & Liyanage, 2013).

**Mediating Role of Work Engagement**

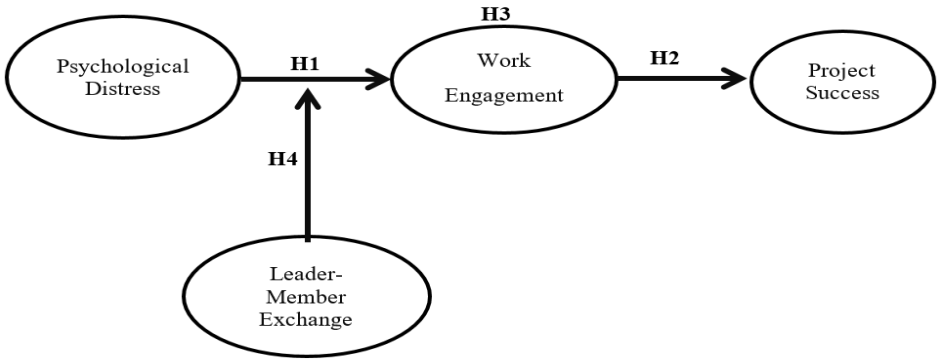
Psychological distress is prevalent among project-based employees due to complex job demands, evolving technologies, and tight schedules. These stressors lead to emotional instability, reduced motivation, and poor decision-making (Sanderson & Andrews, 2006; Hilton et al., 2009). As a result, project performance suffers, leading to decreased project success (Hwang et al., 2007; Mubarak et al., 2022). Empirical evidence supports an indirect relationship between psychological distress and project success, mediated by work engagement (Mubarak et al., 2022). Since distress negatively affects engagement, which in turn influences project outcomes.

**Moderating Role of Leader-Member Exchange**

Leader-Member Exchange (LMX) theory emphasizes fair treatment and reciprocal relationships between leaders and subordinates (Bauer & Erdogan, 2015; Graen & Cashman, 1975). High-quality LMX relationships provide employees with psychological resources such as trust, support, and professional respect (Liden & Maslyn, 1998), which buffer the effects of psychological distress (McCarthy et al., 2016; Hu et al., 2023). In contrast, low LMX environments foster feelings of exclusion and increase vulnerability to stress. As work engagement is a psychological resource (Sweetman & Luthans, 2010), LMX can strengthen it by reducing distress and enhancing feelings of belonging and self-worth.

**Conceptual Framework**

This study is built upon the Job-Demand Resource (JD-R) model (Demerouti et al., 2001), which explains how job demands and resources interact to influence employee wellbeing and performance. In the context of Pakistan's IT industry, psychological distress is treated as a job demand that negatively affects project success. Work engagement is introduced as a mediator, representing a psychological resource that channels the effects of distress toward performance outcomes. Leader-Member Exchange (LMX) is conceptualized as a moderator, a relational resource that buffers the negative impact of distress on engagement. This framework provides a comprehensive view of how emotional and interpersonal dynamics influence project outcomes in high-pressure environments.




**Hypotheses**

H1: Psychological distress is negatively related with work engagement.

H2: Work engagement is positively related with project success.

H3: Work engagement mediates the relationship between psychological distress and project success.

H4: Leader-member exchange moderates the relationship between psychological distress and work engagement; such that when leader-member exchange is high, it will weaken the negative relationship between psychological distress and work engagement.

## Methodology

This study is grounded in a positivist philosophical orientation, which emphasizes objective reality and the use of scientific methods to uncover truths. Positivism supports the hypothetico-deductive approach, where hypotheses are tested through empirical observation and statistical analysis (Saunders, Lewis, & Thornhill, 2003, 2009; Ponterotto, 2005). This orientation aligns with the study's aim to examine functional relationships between psychological distress, work engagement, project success, and leader-member exchange using quantifiable data. The positivist stance ensures that findings contribute to generalizable knowledge and scientific advancement (Žukauskas, Vveinhardt, & Andriukaitienė, 2018). To capture the current state of variables and their relationships, a cross-sectional research design was employed. This design involves collecting data at a single point in time and is suitable for examining associations without the influence of temporal changes (Kesmodel, 2018). The unit of analysis in this study is the individual, specifically employees working in Pakistan's IT sector. This choice is appropriate given the study's focus on psychological distress, work engagement, and interpersonal dynamics, which are best understood at the individual level (Sedgwick, 2014). A non-probability snowball sampling technique was adopted for data collection. Initial participants were selected from the researchers' professional network and were asked to refer the survey to their colleagues. This method is effective for reaching dispersed populations and is both time- and cost-efficient (Parker, Scott, & Geddes, 2019; Naderifar, Goli, & Ghaljaie, 2017). Snowball sampling aligns with the study's goal of theory generalization rather than population generalization. Determining an appropriate sample size is crucial for statistical validity. For Partial Least Squares Structural Equation Modeling (PLS-SEM), a sample size between 160 and 300 is recommended to minimize Type I and Type II errors (Memon et al., 2020; Hair, 2009). Previous studies in project management using PLS-SEM have employed sample sizes within this range (Blomquist, Farashah, & Thomas, 2016; Garcia et al., 2021). Additionally, G*Power analysis was conducted, which indicated a minimum sample size of 77 for three predictors (Hair Jr et al., 2021; Ringle et al., 2020). Based on these considerations, a sample size of 180 respondents was deemed suitable for this study. To ensure clarity and reliability of the questionnaire, a pretest was conducted with 10% of the final sample size, following recommendations by Connelly (2008). This step helped identify ambiguities and ensured that respondents interpreted the items as intended (Sekaran, 2003). Data were collected using a structured survey questionnaire based on a 5-point Likert scale, designed to measure each variable and its relational impact within the conceptual framework. Psychological distress was measured using the Kessler Psychological Distress Scale (K10), a validated screening tool developed by Kessler et al. (2002). The scale includes items adapted from established instruments such as the Beck Depression Inventory (Beck et al., 1961), the Zung Self-Rating Depression Scale (Zung, 1965), and the CES-D Scale (Radloff, 1977). Responses range from "none of the time" (1) to "all of the time" (5). The scale demonstrated high internal consistency with a Cronbach's alpha of 0.93 (Fassaert et al., 2009). Work engagement was assessed using the shortened Utrecht Work Engagement Scale (UWES-9), consisting of 9 items developed by Schaufeli, Bakker, & Salanova (2006) and adapted from Memon, Salleh, & Baharom (2017). The scale measures three dimensions: vigor, dedication, and absorption. A sample item includes: "I feel energetic and enthusiastic about my job." The reported Cronbach's alpha was 0.90. Leader-member exchange was measured using a 7-item scale adapted from Wayne et al. (1997). A sample item includes: "My manager has enough confidence in me that he/she would defend and justify my decisions if I was not present to do so." The scale demonstrated strong internal consistency with a Cronbach's alpha of 0.90. Project success was measured using a 9-item scale adapted from Belout & Gauvreau (2004). A sample item includes: "I achieve the technical requirements, specified at the beginning, in the execution phase." The scale reported a Cronbach's alpha of 0.72. Throughout the research process, ethical standards were strictly upheld. Respondents were informed of the study's objectives prior to participation, and their anonymity was ensured by excluding personal identifiers such as names or employee IDs.

Participation was voluntary, and respondents were free to withdraw at any time without consequence. All collected data were treated confidentially and were accessible only to the researcher and supervisor. Proper referencing and transparency were maintained to uphold academic integrity (Battaglia et al., 2008).

**Analysis**

This study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) for data analysis, a robust statistical technique known for its flexibility and accuracy (Cheah et al., 2018). PLS-SEM was selected due to its minimal requirements regarding sample size, measurement scale, and residual distribution (Naseer et al., 2022). The analysis was conducted in two stages:

**Measurement Model Assessment** – evaluating internal consistency reliability, indicator reliability, convergent validity, and discriminant validity.

**Structural Model Assessment – involving hypothesis testing.**

Additionally, Covariance-Based Structural Equation Modeling (CB-SEM) was used to assess model fit using SmartPLS 4.0 software, following the two-step process recommended by Hair et al. (2019) and Purwanto (2021).

**Normality & Descriptive Statistics**

Demographic data was collected from professionals in Pakistan's IT sector. The gender distribution was 74% male and 26% female, reflecting the male-dominated nature of the industry. Educational qualifications showed 50.8% with a Bachelor's degree, 44.8% with a Master's, 3.3% with a PhD, and 1.1% with certifications.

**Age distribution:**

- 18–20 years: 27.6%
- 21–30 years: 54.1%
- 31–40 years: 12.7%
- Above 40 years: 5.5%

**Job positions:**

- Managerial: 54.1%
- Non-managerial: 45.9%

**Experience in current organization:**

- Less than 1 year: 27.1%
- 1–3 years: 48.1%
- 4–6 years: 7.2%
- 7 or more years: 17.7%

**Correlation Analysis:**

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT). Values below 0.85 (Kline, 2023) or 0.90 (Gold et al., 2001) confirm discriminant validity. All constructs met the criteria, indicating that they are distinct and valid.

| | **LMX** | **PD** | **PS** | **WE** |
|---|---|---|---|---|
| LMX | | | | |
| PD | 0.243 | | | |
| PS | 0.801 | 0.335 | | |
| WE | 0.581 | 0.301 | 0.649 | |
| LMX×PD | 0.197 | 0.340 | 0.196 | 0.094 |

***Measure of Reliability Statistics (Cronbach's Alpha):***
Internal consistency was assessed using Cronbach's Alpha and Composite Reliability (CR). Values above 0.7 indicate acceptable reliability. All constructs demonstrated strong reliability:

According to these tests our variables are reliable as shown in the table below.

| **Variables** | **Cronbach Alpha** | **Composite Reliability** |
|---|---|---|
| **LMX** | 0.917 | 0.933 |
| **Psychological Distress (PD)** | 0.868 | 0.895 |
| **Work Engagement (WE)** | 0.929 | 0.942 |
| **Project Success (PS)** | 0.885 | 0.909 |

***Regression Analysis***
***Structural Model Assessment***
Hypotheses were tested using path coefficients and bootstrapping methods. The results are summarized below:

| Relationship | Beta | STDEV | t | p |
|---|---|---|---|---|
| H1: PD → WE | -0.191 | 0.074 | 2.573 | 0.005 |
| H2: WE → PS | 0.630 | 0.076 | 8.301 | 0.000 |

These results support both H1 and H2, indicating that psychological distress negatively affects work engagement, while work engagement positively influences project success.
Model fit indices also confirmed a good fit:

- **CFI**: 0.92
- **Chi-square (p)**: 0.051
- **RMSEA**: 0.07

***Mediation & Moderation Analysis***
***Mediation Analysis***
Work Engagement was found to mediate the relationship between Psychological Distress and Project Success:

| Relationship | Beta | STDEV | t | p |
|---|---|---|---|---|
| H3: PD → WE → PS | -0.120 | 0.045 | 2.658 | 0.008 |

This supports H3, confirming the mediating role of Work Engagement.

***Moderation Analysis***
Leader-Member Exchange (LMX) was tested as a moderator between Psychological Distress and Work Engagement. The results did not support the hypothesis:

| Relationship | Beta | STDEV | t | p |
|---|---|---|---|---|
| H4: LMX × PD → WE | 0.100 | 0.079 | 1.261 | 0.207 |

Thus, H4 was not supported, indicating that LMX does not significantly moderate the relationship.

| **H. No.** | **Hypothesis** | **Result** |
|---|---|---|
| **H1** | Psychological distress is negatively related with work engagement. | Supported |
| **H2** | Work Engagement is positively related with work engagement. | Supported |
| **H3** | Work engagement mediates the relationship between psychological distress and project success. | Supported |

| | | |
|---|---|---|
| **H4** | Leader-member exchange moderates the relationship between psychological distress and work engagement; such that when leader-member exchange is high as compared to low, it will weaken the negative relationship between psychological distress and work engagement. | Not-Supported |

**Discussion:**

This study explores the indirect impact of psychological distress on project success within Pakistan's IT sector, emphasizing the mediating role of work engagement and the moderating role of leader-member exchange (LMX). The findings support three hypotheses:

**H1**: Psychological distress negatively affects work engagement. Employees under distress show reduced energy and dedication, consistent with prior research.

**H2**: Work engagement positively influences project success. Engaged employees contribute to better project outcomes.

**H3**: Work engagement mediates the relationship between psychological distress and project success, confirming that distress indirectly hampers project success via reduced engagement.

However, **H4**, which proposed that LMX would moderate the relationship between psychological distress and work engagement, was not supported. This may be due to cultural differences, as LMX is a Western-origin concept that may not align with the interpersonal dynamics of Pakistani IT professionals. The study suggests that individual differences, job cultures, and personality traits may influence how psychological resources are utilized, which could explain the ineffectiveness of LMX in this context.

**Limitations**

**This study has several limitations:**

**Cross-sectional design:** Limits the ability to establish causality between psychological distress, work engagement, and project success.

**Cultural specificity:** Focused solely on Pakistan's IT sector, which may limit generalizability and the effectiveness of LMX as a moderating variable.

**Unexplored causes of distress:** The study did not investigate the root causes of psychological distress, such as depression or leadership behavior.

**Limited psychological resources:** Only LMX was considered as a psychological resource, which proved ineffective in this context.

**Recommendation:**

Future research should consider the following:

- **Longitudinal studies**: To better understand the cause-effect relationships over time.
- **Cross-cultural comparisons**: Conduct similar studies in Western contexts to evaluate the effectiveness of LMX.
- **Explore distress causes**: Investigate specific factors contributing to psychological distress, such as depression or leadership styles.
- **Test alternative psychological resources**: Examine the impact of regulatory and affective resources on distress and engagement.

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