

Impact of Effort Reward Imbalance and Fatigue on General Self Efficacy of Nurses Working in Tertiary Care Hospitals

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Abstract

The study aims to investigate the impact of effort-reward imbalance and fatigue on the self-efficacy of nurses working in tertiary care hospitals. A purposive sampling strategy was used to recruit participants from both the public and private sector hospitals. The sample consisted of ($N=91$) participants with a mean age of 27 years. Effort Reward Imbalance (ERI-16 item condensed version) scale, along with the Visual Analog Fatigue Scale and General Self-Efficacy tool was used to measure the relationship among these variables. Results showed that there was a significant relationship between fatigue and self-efficacy of nurses. However, age, effort-reward imbalance, and fatigue were the significant predictors of self-efficacy. Married nurses reflected satisfactory levels of self-efficacy as compared to unmarried nurses. Considering the limited resources for data collection, it is advised to consider a collaboration between hospitals and the research committee. Further, there is a need to conduct a longitudinal study followed by interviews to explore personnel reflection among participants.

Keywords: Effort Reward Imbalance, Fatigue, Nurses, Self-Efficacy

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Introduction

Nurses share dependent, independent, and interdependent roles with the doctors and other surgical staff (Mozafaripour, 2023). Nurses share an equivalent degree of responsibility to encase patient's well-being. Carrying such responsibility comes with great psychological stressors that are often accompanied by physical conditions. The leading factor that intervenes is the effort-reward imbalance pattern attitude being practiced by the nurses.

Effort-reward imbalance is defined as a conflicting transition an individual faces

with a disparity between efforts and rewards accompanied by the organization. Efforts are considered as the inputs such as physiological strain, working hours, etc. while rewards are measured in terms of monetary and non-monetary benefits (Siegrist, 1996). Effort Reward Imbalance is a theoretical model of a psychosocial work environment with an adverse impact on health and well-being focuses on the mismatch between high efforts and low rewards received at work (Ren et al., 2019). According to Siegrist, there is an un-equivalent stress between the effort and reward received by the employee. His theory defines efforts in terms of commitment and insistence needed to perform a job and rewards in terms of monetary and non-monetary benefits. The rewards are the expectations employees anticipate in return not only from the employer but also from society (Siegrist, 1996). Conventionally, the root of over-commitment extends to the individual's cognitive, emotional, and motivational traits (Van Vegchel et al., 2004). The un-equivalent proportions of efforts and reward result in psychosomatic ailments

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and there is a likelihood that such employees might get exposed to fatigue (Avanzi et al., 2013).

Fatigue refers to a subjective lack of physical and mental energy that is perceived by the individual to interfere with the usual or desired activities (Mendoza-Ruvalcaba et al., 2019). When it comes to the hectic role of nurses, anxiety rate, depression, and fatigue are significantly prevalent among frontline medical healthcare workers (Bhandari et al., 2022). Further, nurses are more likely to experience insomnia and psychological distress along with fatigue (Jimmieson et al., 2016). Conventionally, nurses are more likely to experience a state of burnout. Ge et al. (2023) suggested that the likelihood of fatigue and burnout is significantly higher among the nurses providing medical management to patients diagnosed with the COVID-19 virus.

Besides the demanding role of nurses, they are more likely to experience fatigue due to prolonged working hours. A study concluded that nurses with diverse degrees, relationship status, firms, and professional titles play a significant role in fatigue prevalence among nurses (Jimmieson et al., 2016). The study highlighted the significant need to take control over the pertinent factors resulting in compassion fatigue among nurses. Considering the facts, it is evident to conclude that nurses are among the vulnerable populations being confronted by disastrous health hazards in the workplace. Besides the consistent experience of compassion stress, they are exposed to challenging and extremely undesirable situations (Cocker & Joss, 2016).

Self-efficacy can be defined as a personalized belief in one's capability to organize and execute courses of action required to attain designated types of performances (Artino, 2012). The concept extends back from Bandura's study. According to Bandura, self-efficacy refers to an individual's belief or capacity to execute behaviors that are essential to earn

job success (Artino, 2012). The term indigenous describes the potential source of information that inculcates an individual's belief. Bandura stated that such information stems from experiences and mastering psychological aspects (Ercan, 2007). Dispositional resilience and self-efficacy are the two interlinked variables when it comes to nurses (Pan et al., 2021).

Considering the workplace dynamics, the ERI model by Siegrist (1996) serves as a foundational framework. The contemporary model reports the emergence of related health issues when there is an absence of equity between employee's efforts and rewards. Therefore, there is a likelihood that an employee witness fatigue, burnout, lower self-efficacy levels, and in certain cases a terminal illness. This particular notion is supported by Bandura's Self Efficacy theory which predicts that an individual's belief in their capability to perform a task primarily relies on their motivation. Together, these theories provide a comprehensive understanding of how perceived inequities in ERI, fatigue, and self-efficacy can affect employee performance and well-being (Siegrist, 1996).

Globally among the total percentage of healthcare professionals, approximately, 5.3 million nurses are leading the medical care in the world (Salvage & White, 2020). The current study tends to explore the relationship among effort-reward imbalance, fatigue, and self-efficacy within the spectrum of demographic variables. However, the studies incorporated other variables to examine the impact on the self-efficacy of nurses. Secondly, the nature of the sample is the core component of any study. This study follows the trend of previously existing studies.

The following study is designed to study the significant relationship between fatigue, self-efficacy, and effort-reward imbalance. On the same note, the fatigue level is higher among nursing students (Warshawski, 2022). However, dispositional resilience and self-efficacy are the two interlinked

variables when it comes to nurses (Pan et al., 2021). Apart from these facts, various demographics play a role in determining self-efficacy among nurses (Wallin et al., 2022). Among these, intimate support was the leading factor in boosting self-efficacy (Wallin et al., 2022).

Hypotheses

1. There is likely to be a positive relationship between effort-reward imbalance and self-efficacy.
2. There is likely to be a negative relationship between fatigue and self-efficacy.
3. Effort reward imbalance is likely to predict fatigue with positive regression weight.
4. Effort-reward imbalance is likely to predict lower self-efficacy with a negative regression weight.
5. Fatigue is likely to predict self-efficacy with negative regression weight.
6. Married female nurses experience a low level of fatigue as compared to unmarried female nurses.
7. There are likely to be differences among married and unmarried nurses on the effort-reward imbalance scale.
8. There are likely to be differences among married and unmarried nurses on fatigue levels.
9. There are likely to be differences among married and unmarried nurses on self-efficacy.

Methodology

Research Design

Co-relational research design was used to identify the degree of relationship between effort-reward imbalance, fatigue, and self-efficacy among nurses working in tertiary care hospitals.

Sampling Strategy

Purposive sampling is considered for this study. The research focuses on a particular population that is nurses and is further specified by tertiary care. Therefore, purposive sampling would be the best approach to extract diverse degrees of information from the sample.

Participants

For the data collection, one hundred nurses were approached working in various government and private hospitals of Lahore with respective age ranges of 20-55. Among the cumulative hospitals within Lahore, the researcher obtained permission from one government, one semi-government, and one private hospital. Considering the availability of nurses, one hundred participants were on target. Ninety-six responses were successfully recorded with 9 male and 91 female nurses. 75.8% were Muslim, 23.1% were Christian and 1.1% were Hindu only. The cumulative results showed that 89.9 % of data was from government hospitals, 9.9 % were private, and only 1.1 % data from semi-government hospitals. The standard age of 27.58 with an approximate salary of 61k-80k receiving a 15% incentive annually.

Inclusion Criteria

The study entertains the female gender only, with a respective age range of 20-55 years old. The acceptable working hours should be eight or more with an approximate experience of 1 year. Lastly, the intended sample should be a certified nurse or a registered one.

Exclusion Criteria

Only females were included in this study. Further, the study will not entertain nurses under 20 years of age, and experience less than 1 year. As the study is focusing on effort-reward imbalances, the prime focus will be diverted over the nurses serving less than 8 hours.

Measures

Consent Form and Demographic Sheet

For this study, a consent form and demographic sheet were used.

Effort Reward Imbalance Questionnaire

To measure effort-reward imbalance, the revised version of the Effort-Reward Imbalance Questionnaire was used (Siegrist et al., 2019). The short version consist of 16 items in total rated by a four-point Likert scale was used. The rating follows a pattern of strongly disagree, disagree, agree and strongly agree. First 10 items measure

effort-reward imbalance while the last 6 items measure the over-commitment. Item 5, 6, 7, and 13 were reversed scored. The questionnaire is self-reported and comes up with Cronbach's co-efficient greater than .70.

Visual Analogue Scale

For fatigue, Visual Analogue Scale (VAS-F) by Lee et al. (1991) was used. Out of a total of 18 items, item number 1-5 and 11-18 evaluate fatigue and 6-10 measure energy with respective scoring ranges of 0-100. VAS-F is a self-administered questionnaire and comes with concurrent validity being established with Stanford Sleepiness Scale and Profile of Mood States Scale. The calculated reliability of Visual Analogue Scale to Evaluate Fatigue Severity falls in range of .94-.96.

General Self Efficacy Scale

The general self-efficacy was measured by General Self-Efficacy Scale developed by Schwarzer & Jerusalem (1995). The scale consisted of total 10 items rated on 4-point Likert scale. The scaling pattern is not true at all=1, hardly true=2, moderately true=3, and exactly true=4 with a cut-off score of 10-40 indicating the highest scores. The scale entertained the factorial analysis of burnout, depression, negative emotion, work satisfaction, and other cognitions with significant reliability ranging from .76-.90.

Ethical Considerations

The current study follows the ethical guidelines restricted by APA. Permissions from the research committee, tool authors, and contemporary resources were considered. There is no harm involved and the researcher abides by the adulteration or fabrication of collected data.

Results

Table 1

Psychometric Properties of Independent Variable (Effort, Reward, Over-Commitment, Fatigue, and Energy) and Dependent Variable (General Self-Efficacy) with (N=91)

| Measures | <i>k</i> | <i>M</i> | <i>SD</i> | Range | α |
|-------------------------------|----------|----------|-----------|-------|----------|
| Effort Reward Imbalance Scale | 16 | | | | |
| Effort | 3 | 9.38 | 1.91 | 5-12 | .630 |
| Reward | 7 | 17.93 | 4.65 | 7-50 | .286 |
| Over-commitment | 6 | 17.69 | 4.26 | 11-48 | .219 |
| Visual Analogue Fatigue Scale | 18 | | | | |
| Fatigue | 13 | 62.01 | 26.06 | 7-130 | .864 |
| Energy | 5 | 37.00 | 8.98 | 17-50 | .742 |
| General Self Efficacy | 10 | 32.24 | 6.98 | 21-77 | .528 |

Note. α = Cronbach's alpha, *k*=number of items, *M*=mean, *SD*=Standard Deviation

The Cronbach's alpha value for each subscale was used in the study. The following results reflect a satisfactory internal consistency level. The internal consistency of the Effort Reward Imbalance tool falls in the range of .21 to .63 which falls in low to moderate. The visual Analogue Fatigue Scale subscale reflects

excellent internal consistency ranging from .742 to .864 which is good. Further, the value for the General Self-Efficacy scale is .528 which represents moderate reliability. A central limit theorem was applied that says the data is normally distributed as the sample size was greater than 30 ($N > 30$) (Kwak & Kim, 2017).

Table 2

Correlation Coefficient between Age, Effort Reward Imbalance, Visual Analogue Fatigue, and General Self-Efficacy (N=91)

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------------------|-------|------|-------|-------|-------|-------|-------|
| 1 Age | 1 | .051 | -.059 | .03 | -.24* | .29** | .46** |
| 2 Effort | | | -.03 | .31** | .17 | .12 | .15 |
| 3 Reward | | | | .09 | .08 | -.04 | .10 |
| 4 Over-Commitment | | | | | .24** | -.003 | .17 |
| 5 Fatigue | | | | | | -.18 | -.054 |
| 6 Energy | | | | | | | .38** |
| 7 GSE | | | | | | | 1 |
| <i>M</i> | 27.58 | 9.38 | 17.93 | 17.96 | 62.01 | 37.00 | 32.24 |
| <i>SD</i> | 6.65 | 1.19 | 4.65 | 4.26 | 26.06 | 8.98 | 6.98 |

Note. ** $p < .01$, * $p < .05$, GSE=General Self-Efficacy Scale, *M*=Mean, *SD*=Standard Deviation

The Table 2 highlights the significant relationship between age, effort, fatigue, energy, and general self-efficacy. There exists a negative significant correlation between age and fatigue ($p < .005$), a positive correlation between age and energy, and a strong positive correlation between age and general self-efficacy. It

shows that the demographic variable age has a significant correlation between fatigue and general self-efficacy among nurses. However, energy reflects a strong positive correlation with general self-efficacy ($p < .005$) which indicates that if a person feels energized his/her self-efficacy would also increase and vice versa.

Table 3

Summary of Multiple Regression Analysis of Predictors (Age, Effort, Reward, Over-Commitment, Fatigue, and Energy) on Dependent Variables (General Self-Efficacy) among Nurses (N=91)

| Model | Predictor | R^2 Change | β | SE β |
|-------|-----------------|--------------|---------|------------|
| 1 | Step 1 | | | |
| | Age | .21** | .46 | .09** |
| 2 | Step 2 | | | |
| | Age | .04** | .457 | .09** |
| | Effort | | .13 | .35 |
| | Reward | | .120 | .14 |
| | Over-commitment | | .10 | .16 |

| Step 3 | | | | |
|----------------------------|-----------------|------------|-----|-------|
| | Age | .06** | .39 | .10** |
| 3 | Effort | | .69 | .35 |
| | Reward | | .12 | .13 |
| | Over-commitment | | .11 | .15 |
| | Fatigue | | .04 | .02 |
| | Energy | | .27 | .07* |
| Total R² | | .31 | | |

Note. A Dependent Variable: GSE (General Self-Efficacy Scale), d Predictors: ((Constant), Age, Effort, Reward, Over-Commitment, Fatigue, Energy)

Multiple Hierarchical Regression Analysis was used to determine the relationship between predictors i.e., demographic variable (age), effort-reward imbalance, fatigue, and energy with dependent variable i.e., general self-efficacy. Table 3.4 shows the calculated results of three models used to study the predictors of dependent variables. Firstly Durbin-Watson test was run which ranged between 0 to 3 fulfilling our assumption that there exists no multicollinearity among the variables studied. Model one consists of the demographic variable age; it was found that age is the significant predictor of general self-efficacy among nurses with a variance of 21%. Model two consists of age, effort, reward, and over-commitment and was proven a significant model with a variance

of 40%. The predictor age from model two was discovered as a significant predictor while others were not. It means that there was a potential impact of age on the general self-efficacy of nurses.

Model three comprises age, effort, reward, over-commitment, fatigue, and energy. It was found that these predictors reflect a variance of 6% jointly. Besides age being a significant predictor, energy also came out as the strong predictor of general self-efficacy with $p < .05$. Predictor age was highly significant with ($\beta = .39$, $p < .05$) and energy with ($\beta = .27$, $p < .05$). The cumulative results showed that predictor age and energy affect the general self-efficacy among nurses with positive regression weight.

Table 4

Group Statistics of Married (N=44) and Unmarried Nurses (N=46) measuring Effort Reward Imbalance, Fatigue and General Self-Efficacy

| Dimensions | Married | | Unmarried | | <i>t</i> | <i>P</i> | 95% CL | | Cohen's <i>d</i> |
|-----------------|----------|-----------|-----------|-----------|----------|----------|-----------|-----------|------------------|
| | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> | | | <i>LL</i> | <i>UL</i> | |
| Effort | 9.13 | 1.94 | 9.65 | 1.88 | -1.27 | .754 | -1.31 | .287 | 0.28 |
| Reward | 17.61 | 2.89 | 18.21 | 5.92 | -.609 | .219 | -2.57 | 1.36 | 0.12 |
| Over-Commitment | 17.36 | 2.78 | 18.67 | 5.23 | 1.47 | .369 | -3.07 | .457 | 0.31 |
| Fatigue | 54.38 | 29.07 | 69.23 | 20.99 | 2.78 | .045 | -25.4 | -4.2 | 0.58 |
| Energy | 39.13 | 8.15 | 35.08 | 9.43 | 2.17 | .082 | .349 | 7.74 | 0.45 |
| GSE | 33.45 | 8.31 | 31.17 | 5.34 | 1.55 | .565 | -.634 | 5.19 | 0.32 |

Note: *M*=Mean, *SD*=Standard Deviation, GSE= General Self-Efficacy, *LL*=Lower Limit, *UL*=Upper Limit, *p*<.05

The results showed that there is a significant difference in the fatigue levels and general self-efficacy of married and unmarried women. It was indicated that unmarried female nurses tend to experience

higher levels of fatigue as compared to married nurses. However, married nurses reflected higher levels of energy as compared to unmarried female nurses.

Discussion

The psychometric properties of the visual analog fatigue tool reflected significant reliability. Hence proving that the tool is valid to measure the levels of fatigue among nurses. Similar results were derived from a study by Lee et al. (1991) that shows the same internal consistency of fatigue among medical staff. The results of this study hold a firm literature background of studies measuring the reliability, responsiveness, and validity of the visual analog fatigue scale to measure exertion fatigue in people with chronic stroke (Tseng et al., 2010).

The study by Tsutsumi et al. (2003) enlisted a validated reason for lower internal consistency i.e., the demographic variable age. Effort reward imbalance is more likely to reflect among people sharing 25 and 30 years of age and over-commitment increases over age. The effort-reward imbalance scale used in the intended study was initially developed and standardized on the population of teachers. Considering the

viable dynamics of effort, reward, and over-commitment, researchers considered employees working in diverse organization environments. But, in the case of nurses, the concluded results are questionable hence predicting the need to design a standardized tool. Another significant outlining factor behind the lower internal consistency of these scales was the misinterpretation of items by respective participants. The tool does include the demanding variables that were misunderstood by the participants. Secondly, the internal consistency of general self-efficacy was found to be inflicted due to the presence of significant fatigue levels among nurses. Further, it was observed that the items of the general self-efficacy scale were significantly misunderstood as the participants reported that there was a repetition of questions in the survey. For instance, there were four items reported as consistent and weak by the participants.

Primarily, these two scales reflected lower reliability as compared to the Visual Analogue Fatigue scale. The most valid reason behind this is the homogeneity of group variances. Such as the participants holding similar educational and workplace experiences. The demographic variables such as age, gender, education, designation, experience, nature of the job was falling in a single bell-shaped curve. The sample in general reflected similar characteristics that could be a plausible reason behind the lower internal consistency of scales (Ercan, 2007).

Pearson Product Moment Correlation Analysis was used to identify the relationship among the intended variables. Hypothesis 1: there is likely to be a positive relationship between effort-reward imbalance and self-efficacy. Statistics showed that there was no relationship to be found among effort, reward, over-commitment, and self-efficacy. The hypothesis suggests that there is likely to be a negative relationship between fatigue and self-efficacy. The extracted information showed that the hypothesis was partially substantiated and there existed a negative correlation between fatigue and self-efficacy. It was found that shows a significant correlation with the dependent variable i.e., self-efficacy. The study measured the relationship between self-efficacy and burnout among nurses (Alidosti et al., 2016). The corresponding results showed that the nurses reporting significant burnout levels reflected lower levels of self-efficacy. However, studies showed that personality factors play a mediating role in determining the relationship between burnout and self-efficacy (Ren et al., 2019).

A positive correlation was found between age and general self-efficacy ($p < .005$). However, concerning an increase in age, consequently self-efficacy increases. Possible justifications are drawn by a configurative fact that mastering expertise comes with age (Liisa et al., 2021). With a potential increase in age, there comes more

exposure that inculcates mastery among individuals. Therefore, there is strong evidence of reflecting higher general self-efficacy among aged people (Kim et al., 2020).

Multiple hierarchical regression was used to measure the predictors (age, effort, reward, over-commitment, fatigue, and energy). The possible set of justification of this configurative predictor of age, energy, and self-efficacy can be justified primarily based on their role. A study depicted that people of older age are more flexible and reflect significant levels of self-efficacy (Zeng et al., 2022). Research has laid evidence highlighting the relationship between energy and general self-efficacy that is triggered by the individual's role. Roles are often associated with substituent levels of power, legitimacy, and responsibility. Conventionally, these facets come up with a great sense of responsibility that inculcates energy levels within an individual. Contrary, there are significant levels of self-efficacy within an individual (Korman et al., 2021).

Besides the ambivalent role of nurses, there is a constant need to reflect empathy and mindfulness along with significant levels of energy. Therefore, individuals inculcate themselves in that particular role and reflect arbitrary levels of energy. (Adetola et al., 2022). During the data collection, participants reported that they are empowered by their assigned role as it's in their religion to help in healing. Consequently, there were higher levels of internal motivational factors were observed. A study showed that nurses have a significant level of intrinsic motivation that drives them to reflect on their roles effectively (Zeng et al., 2022).

An Independent sample t-test was used to study the mean differences between married and unmarried female nurses working in tertiary care hospitals. Hypothesis 1 suggested that married female nurses experience a low level of fatigue as compared to unmarried female nurses. The comparisons of means

show a significant difference in fatigue levels among married and unmarried female nurses. The hypothesis suggests there are likely to be differences among married and unmarried nurses on ERI, fatigue, and self-efficacy. The extracted results showed that there were significant mean differences among married and unmarried female nurses. The possible justification of this statistical analysis can be linked to a recent study by Voth Schrag et al. (2022). The study highlights the significant impact of a husband's support on lowering fatigue levels.

Conclusion

The study was conducted to measure effort-reward imbalance, fatigue, and self-efficacy among nurses working in tertiary care hospitals in Pakistan. The calculated results showed that there was a meaningful relationship between fatigue and the self-efficacy of nurses. However, age, effort-reward imbalance, and fatigue were significant predictors of self-efficacy.

Limitations

The study only included female nurses and ignored the other genders, secondly, the criteria was to restrict that it focuses on the mean comparisons of married and unmarried. However, single mothers, widowed with children or without children were ignored. The sample must contain heterogeneity indulging large sample size. Instead of close-ended questions, interviews hold the potential to explore individual perceptions. Certainly, due to restricted resources such as research grants, availability of nurses, and ethics committee approval, the researcher obtained data from a limited number of hospitals. Therefore, it is advisable to involve the Ministry of National Health Services.

Implications

There is a need to conduct further indigenous research on nurses since there is limited data availability. To improve the nursing facility, there is a need to investigate the profitability of organization policies and facilities. Therefore, instead of surveys, interviews should be conducted to

explore themes. Considering the demographic and organizational variables, it is suggested to design a standardized tool that intentionally focuses on measuring the ERI among nurses.

Future researchers must consider a diverse sample (i.e., male and female nurses) and pair it with the predictors or control variables (e.g., work environment, support systems) to increase the explanatory power of the model. Lastly, it is suggested to follow up longitudinal study to explore contradictory factors that evolve and can reflect a potential impact on the overall dynamics of the study.

Contribution of Authors

Saliha Afzal: Conceptualization, Investigation, Methodology, Data Curation, Formal Analysis, Writing – Original Draft
Kholah Tahir: Methodology, Writing - Reviewing & Editing, Supervision

Conflict of Interest

There is no conflict of interest declared by the authors.

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Data Availability Statement

The datasets of the current study are not available publicly due to ethical reasons but are available from the corresponding author [S.A.] upon the reasonable request.

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