Research Article

Relationship between Effort Reward Imbalance and Work Engagement among Medical Staff in Egypt: A Cross-Sectional Analytic Study

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Background

Effort-Reward Imbalance (ERI) model is a model that suggests that any work-related benefit should be based on the principle of a relationship between efforts and rewards at work. The medical staff as one of the healthcare professionals faces different stressors, challenges, heavy workload, and emotional distress. Continuous exposure to these stresses without being adequately rewarded adversely affects their health, increases burnout levels, and could undermine their level of work engagement.

Aim

This study aims to explore the relationships between effort-reward imbalance and work engagement among health care medical staff.

Methods

Two self-administered questionnaires were used and distributed in online formats: ERI was assessed using Siegrist effort-reward imbalance questionnaire and work engagement was assessed using the Utrecht Work Engagement Scale questionnaire. The data was collected from 283 participants belonging to 26 health care institutions in Egypt.

Result

This study showed that the mean effort-reward ratio was high for most of the study participants, while total work engagement showed a moderate mean score. It also showed that Effort-Reward Ratio had a significant negative correlation with work engagement.

Conclusion

This study concludes that the imbalance in the effort rewards ratio leads to a decrease in work engagement. Esteem and promotion rewards together with age are good predictors of work engagement. Therefore, stakeholders should balance effort and reward, and provide opportunities for career development and self-actualization. Additionally, health managers should help healthcare medical staff balance the effort exerted and value of their work and try to keep them devoted to their work.

Keywords: Effort, Reward, Work engagement, health professionals, medical

1. Introduction

Effort-Reward Imbalance (ERI) model is a model in which there is an imbalance between the level of the amount of pressure and overwork on finishing the job as well as the responsibility level as perceived by the individual and the amount of reward including payment, job status and the opportunities for appreciation/recognition [1]. The model suggests that any work-related benefit should be based on the principle of a relationship between efforts and rewards at work. Moreover, the ERI Model claims that a reciprocity deficit between ‘‘costs’’ and ‘‘gains’’ may arise when there are high efforts and low rewards at work that ultimately will cause stressful conditions. It is also assumed that this imbalance will have more severe consequences with a highly overcommitted worker than less committed workers. Over the past years, the ERI model has gained more popularity and many researchers conducted various relationship studies from different perspectives [2].

ERI may lead to sustained and long-lasting effects. Working hard but with no proper reward is an example of this imbalance and can cause stress that may last for a long time, and eventually can cause autonomic nervous system disorder as well as physical and mental illness [1].

The concept of effort at work reflects both an extrinsic requirement to which the working individual responds as well as a subjective intrinsic motivation. In most institutions, matching the external requirements is considered an important part of the control procedures established to maintain commitment, thus leaving little opportunity for variations of intrinsic motivation. However, individual requirements are sometimes exceeded in situations of massive informal pressure exerted by a competitive work team (e.g., group piece work), also the requirements are likely to be exceeded if the person is characterized by an excessive motivational pattern with a high need for approval and self-esteem at work. This pattern will eventually lead to the “high cost/low gain” experience at work despite the absence of extrinsic pressure [3].

As medical staff one of the Healthcare professionals, whose job is to improve people’s and community health, are essentials to the success of any health system. To respond effectively to the populations as well as community health needs, healthcare

professionals themselves must be in a perfect state of both physical and psychological health. However, they face different psychosocial stresses, including long working hours, heavy workload, workplace violence, and emotional distress. Continuous exposure to these stresses without being adequately rewarded adversely affects their health, increases burnout levels, and eventually could undermine their level of work engagement [4].

Work engagement is defined as a positive work-related state of mind that is characterized by vigor, dedication, and absorption. Work role matching, perceived equity, institutional trust, and psychological support in addition to many other factors were found to enhance engagement behavior. The concept of engagement is also related to the perceived matching between a person's self-concepts and job descriptors. High levels of work engagement will lead to an interesting work experience and will induce happiness, joy, and enthusiasm at work. Work engagement is recognized as the activated state of positive work-related effect with a marked sense of energy and enthusiasm [5].

Engagement comprises a combination of positive and recompensing feelings of vigor, dedication, and absorption at work. Vigor is perceived as high levels of energy and mental resilience, and the readiness to persist in the face despite difficulties. Dedication refers to the strong feeling of involvement, enthusiasm, and pride in work while absorption is characterized as being fully involved in work with difficulty in detaching self from work. Research suggested that decreasing job demands including heavy workloads and difficult environmental conditions and increasing personal empowerment including social support, autonomy, and resilience would enhance work engagement [6].

Although there have been several studies measuring ERI and others measuring Work Engagement among healthcare professionals, few studies have examined the relationship between ERI and work engagement, especially in Egypt. Accordingly, this study aims to explore the relationships between effort-reward imbalance and work engagement among health care medical staff.

1.1 Research questions:

1. What is the relationship between ERI and Work engagement among medical staff?
2. What are the differences in ERI and work engagement levels between different medical specialties?
3. What are the differences in ERI as well as Work Engagement levels between senior and junior physicians/staff members?

2. Subjects and Methods

2.1 Type of the Study

It is a cross-sectional analytic study.

2.2 Study Setting

This study was conducted by a research team from the Medical Education Department at the faculty of medicine, Suez Canal University, Egypt, and included medical staff from different health care institutions in Egypt. A questionnaire was prepared on Google forms and disseminated to a convenient non-probability sample of the medical school faculty through various social platforms. The social platforms represent various official, non-official groups and web pages that include most of the medical staff community members. All members of

the Egyptian medical schools had a chance to be included in the study.

2.3 Sampling technique

A non-probability convenient sampling technique was used from different health care medical staff from various institutions (26 health care institutions).

2.4 Sample size

N= {(Zα+Zβ)/C}2 + 3 [7]

Where N = Sample size

α (two-tailed) = 0.05 (Threshold probability for rejecting the null hypothesis. Type I error rate).

Zα = 1.9600 (The standard normal deviate for α)

β = 0.10 (Probability of failing to reject the null hypothesis under the alternative hypothesis. Type II error rate.)

Zβ = 1.2816 (The standard normal deviate for β)

C = 0.5 * ln[(1+r)/(1-r)] = 0.3654

r = 0.35 (The expected correlation coefficient) [8]

So, by calculation, the sample size should not be less than 82 participants. After adding a 10% non-response rate, the sample size should include 74 participants. The actual sample included 283 participants.

2.5. Data collection tools

In this study, two self-administered questionnaires were used and distributed in online formats: Siegrist effort-reward imbalance questionnaire and the Utrecht Work Engagement Scale questionnaire. In the section on demographic data, questions that were asked are about age, sex, job title, and institution.

2.5.1 Effort-reward imbalance

The ERI scale is a self-report questionnaire composed of16 items: 10 are measuring reward, six are measuring effort, and six are measuring over-commitment. The responses to all the items were scored on a four-point Likert scale (1=strongly disagree, 4=strongly agree) (9). (Annex1)

Items were summed up for each subscale and the ratio was calculated by dividing the sum score of the effort subscale through the sum score of the reward subscale and multiplied by the correction factor 10/6 to adjust for the unequal number of items per subscale. A ratio over one indicates an unfavorable imbalance characterized by high efforts spent which are not met with corresponding rewards.

2.5.2 Work Engagement Questionnaire

The Utrecht Work Engagement Scale (UWES-17) is a self-report questionnaire composed of 17 items measuring three aspects of work engagement: work vigor (6 items), work dedication (5 items), and work absorption (6 items). Items were summed up for each subscale and each subscale was classified as being high or low (10). (Annex2).

2.6 Ethical considerations

The Ethics Committee of the Suez Canal University approved the study. This study was conducted in accordance with the Declaration of Helsinki and those of the Declaration of Geneva. The participants were informed about the purpose of the study and its relevance to the field of medical education. Only those who agreed to be involved in the study were included under the reassurance that participant names and affiliation were to remain highly confidential. Any information the participants were included in the questionnaires was dealt with anonymously.

3. Results

3.1. Sociodemographic characteristics

The descriptive statistics of the sample are shown in Table 1. Data was collected from 283 participants belonging to 26 health care institutions in Egypt. Three questionnaires had to be discarded due to missing data and incomplete questions after a quality check. Accordingly, the total sample was 280 medical staff (n=280). Different medical specialties were included which were "Emergency medicine, urology, anesthesia, surgery, orthopedics, obstetrics & gynecology, pediatrics, dermatology, cardiothoracic surgery, ophthalmology, radiology, neurology, nephrology, Internal medicine, family medicine, public health, microbiology, pathology, medical education, physiology"

In the sample, most of the respondents were females (71.08%) and their mean age was 33 years (SD = 6.23). Most were senior staff (47.86%). Academic staff accounted for 51.80% of medical staff surveyed, followed by clinicians (48.20%), most of them are working in non-teaching health institutions.

Table 1: Demographic characteristics (n=280)

Demographics	**Mean (SD) N %**
Age	33.42(6.23)
Gender	
Male	81(28.92%)
Female	199(71.08%)
Seniority	
Junior (≤ 3 years of practice)	76(27.14%)
mid-senior (3-5 years of practice)	70(25%)
Senior (≥ 5 years of practice)	134(47.86%)
Specialty	
Academic staff	145(51.80%)
Clinicians	135(48.20%)

3.2 Effort Reward Ratio (ERR) and total Work Engagement

The mean score for effort reward ratio (ERR) was 2.55 ± 0.26. Nearly all study participants had an ERR higher than 1.0. The mean score of total work engagement score was 3.69 ± 0.98 as appears in Table 2. The absorption subscale of engagement should have the highest mean score 4.64± 1.05 followed by the dedication subscale 3.94 ± 1.26.

Table 2: Means, standard deviations (SD), and correlations of study variables (n=280)

Variable	Mean (SD)
Effort Scale (6-24)	19.44(2.65)
Reward Scale (10-40)	23.99 (4.57)
Vigor Scale (0-6)	3.50(0.79)
Absorption Scale (0-6)	4.64 (1.05)
Dedication Scale (0-6)	3.94 (1.26)
Total Engagement Scale	3.69(0.98)
Effort reward ratio	2.55(0.26)

3.3 Correlations among the study variables

Pearson's correlations among the study variables are shown in Table 3. ERR was negatively correlated with work engagement. Work engagement was positively correlated with age. Total work engagement was also positively correlated with the reward scale.

Table 3: Correlation Coefficients among study variables

Variables	Reward Scale	Vigor Scale	Absorption Scale	Dedication Scale	Total Engagement Scale	ERI Ratio	age
1. Effort Scale	-0.***29*** (0.000)**	0.***163*** (0.006)**	-0.20 (0.001)**	0.047 (0.430)	0.146 (0.014)**	0.681 (0.000)**	-0.032 (0.595)
2. Reward Scale		0.212 (0.000)**	0.165 0.006**	0.322 (0.000)**	0.267 (0.000)**	0.853 (0.000)**	0.016 (0.786)
3. Vigor Scale			0.731 (0.000)**	0.671 (0.000)**	0.881 (0.000)**	-0.072 0.227	0.168 (0.005)**

4. Absorption Scale				0.699 (0.000)**	0.899 (0.000)**	-0.014 (0.813)	0.086 (0.151)
5. Total Engagement Scale						-0.122 (0.041)**	0.121 (0.043)**
6.ERI Ratio							-0.025 (0.672)
7. Dedication Scale							0.080 (0.181)

ERR Effort/reward ratio

**p < 0.01

3.4 Associations of Effort Reward Ratio, Work Engagement with other variables

Table 4 shows a statistically significant difference in ERR between males & females with a higher ratio among males (3.96±1.04) (P=0.004). A statistically significant difference was also found between Total work engagement and seniority level (P=0.018) indicating that senior staff is more engaged than junior & mid-senior staff. On the other hand, ERR was highest in mid-senior staff (2.63±0.32) (P=0.001).

Table 4: Difference between Total work engagement and ERR according to gender, seniority level and specialty

		Total Engagement Scale		**Effort reward ratio**	
Gender	Male(81)	2.54(0.26)	0.191 (0.849)	3.96 (1.04)	- 2.934 (0.004)
	Female(199)	2.55(0.25)		3.59 (0.94)	
Seniority	Junior(76)	3.53(0.97)	2.015 (0.018)	2.47 (0.19)	7.48 0.001)(
	mid-senior(70)	3.66(0.99)		2.63 (0.32)	
	Senior(134)	3.81(0.97)		2.56 (0.24)	
Specialty	Academic staff	3.65(1.01)	**0.578**	2.56	3.22

	(145)		**0.562)**(	(0.26)	0.725) (
	Teaching hospital clinicians (27)	3.86(0.96)		2.56 (0.33)	
	Clinicians in other facilities (108)	3.72(0.96)		2.53 (0.25)	

3.5 Linear regression analysis

Table 5 shows the statistically significant variables that emerged in the analysis. The results showed that age was significantly associated with work engagement (β = 0.134, P = 0.018) The table also shows the best-fit model for the multiple linear regression analysis of other factors affecting the total engagement scale. It is evident that the independent variables that significantly affect the total engagement scale together are effort scale (β = 0.241, P = 0.000), Esteem subscale of reward (β = 0.175, P = 0.015) & Promotion subscale of reward (β = 0.218, P = 0.002).

The previous analysis indicates that age, esteem, and promotion rewards emerged as the most important predictor of the global work engagement scale. Seniority, as well as esteem and promotion rewards, seem thus to be important for medical staff's work engagement. On the other hand, security reward was not detected as a predictor for work engagement.

Table 5: Multiple linear regression analysis predicting Total work engagement by, age ERI and its subscales

Independent variables	ß -regression coefficient	Std. Error	t	P-value
Age	0.134	0.009	2.374	**0.018***
Effort scale	0.241	0.022	4.139	**0.000****
Reward subscales				
Esteem subscale of reward	0.175	0.032	2.459	**0.015***
Promotion subscale of reward	0.218	0.031	3.158	**0.002***
Security subscale of reward	0.099	0.048	1.658	0.099

*(statistically significant at P < 0.05)

** P<0.001(highly significant)

Dependent variable: total engagement scale

4. Discussion

The purpose of this study was to explore the relationships between effort-reward imbalance and work engagement among health care medical staff. Furthermore, the difference in work engagement and ERR among different specialties and seniority levels were examined. This is the first study up to our knowledge to examine the relationships among these variables in Egypt.

The overall high effort-reward imbalance ratio in our study is consistent with Roshangar et al. [1] who found more than 50% of his study sample reported high levels of ERR and with those of Jachens et al. [11] which stated that 34% of the study population reported high ERR. The high ERR in the current study could be explained by the heavy workload/hours and work/financial characteristics as well as poor resources provided to the healthcare sector in Egypt as one of the developing countries. Various studies [4, 12, 13, 14] showed similar findings as health workers received lower rewards such as an unsatisfactory salary and low career opportunities concerning their efforts.

Regarding the difference in ERR between males & females, our study showed that males had higher ERR than females. In contrast to Tzeng et al. [15] who indicated that males reported lower ERR than females. This difference could be attributed to the fact that males are more financially responsible than females in our region.

Our study has also investigated the difference in ERR between different health care specialties and we found no significant difference. This is echoed by Rosta et al. [16] who also found no significant changes between hospital doctors and private practice specialists in his study. Our study results are inconsistent with the results of Tsutsumi et al. [14] who claimed that private-sector health workers show high ERI levels and attributed that to the fact that they are self-employed and have to run their clinic depending on nobody.

The results of our study indicated a high mean effort score and low reward score. This finding is congruent with that of Rosta et al. [16] who declared the same finding. This could be explained as the average medical staff in Egypt work for at least 8 hours per day) 5 days/week).

Our study showed that most of the study population exhibited average work engagement levels. This finding is to some extent different from that of Duraisingam et al. [6] who declared that most workers in his study exhibited high engagement levels, suggesting that most were dedicated and motivated in their jobs and also with Lepistö et al. [17] who reported high engagement levels among his study sample. This difference may occur due to the deficient motivational strategies that help to make medical staff more engaged.

In our study, we also found that senior health care staff had higher/lower engagement levels than mid-senior and junior ones, and this could be explained as Duraisingam et al. [6] suggested in their study that older health care professionals, with their long years of work and life experiences, have developed sufficient strategies to cope with demands and to be more committed to their work, compared with their younger counterparts. The previous is also echoed by another two studies by Lepistö et al. & Wang et al. [17,18] in which they reported that engagement

levels were significantly higher in older health care professionals than in their younger colleagues.

Regarding the relationship between work engagement levels and age, our study should that there is a significant relationship between them, and this is different from that of Wilczyński et al. [19] as he found no significant correlation between work engagement and age. On the other hand, no significant relation was found between engagement and gender which is incongruent with Lepistö et al. [17] who found that women experienced more work engagement than men, especially vigor. This echoes the previous assumption that motivational strategies lack for both males and females.

In this study, scores on the dedication and absorption dimensions of work engagement were relatively high. This is matching the high scores of these dimensions that Ge et al. [4] found in his study, and this could be explained by the cultural background of our country as healthcare professionals particularly doctors are important figures that require them to be active and highly dedicated.

Regarding the relationship between effort-reward ratio and work engagement, our study showed that ERR is negatively correlated with work engagement indicating that this imbalance could negatively affect medical staff engagement as they receive lower rewards, such as an unsatisfactory salary and low career opportunities concerning their efforts. This is consistent with the findings of Ge et al. [4]. In contrast to this finding Wang et al. [18] found ERR was positively correlated with vigor, dedication, and absorption.

Limitations of the study

The present study had some limitations. First, this study used a cross-sectional design, which precludes making causal conclusions. Longitudinal studies are needed to examine causal relationships among the variables. Second, we used a self-report online method to collect data in the current rather than face-to-face investigations to reach in-depth detailed qualitative data. Third, more details regarding work hours and workload could also add to the value of the findings. Finally, the results might have related to the experiences of the sample presented and therefore not be transferable to a larger population due to the type of sample used.

5. Conclusions

This study concludes that the imbalance in the Effort rewards ratio leads to a decrease in work engagement. Also, the imbalance differs according to gender and age. Finally, esteem and promotion rewards together with age are good predictors of work engagement. Therefore, stakeholders should balance effort and reward, and provide opportunities for career development and self-actualization. In addition, health managers should help healthcare medical staff balance the effort exerted and value of their work and try to keep them devoted to their work. This could happen by providing opportunities for financial support, career development, and training.

Conflict of interest

The authors report no conflict of interest in this work

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