# Role of Mental and Physical Fatigue in Cognitive Failures among Employees of Pharmaceutical Companies

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## Abstract

The present study aimed to examine the predicting role of physical and mental fatigue in cognitive failures among employees of national and international pharmaceutical companies. It was also intended to determine the influence of various demographics (such as gender and job experience) in relation to study variables. Sample consisted of 406 employees of pharmaceutical companies' employees with age range of 22– 55 years. Measures of Chalder Fatigue Scale (Chalder et al., 1993) and Workplace Cognitive Failures Questionnaire (Wallace & Chen, 2011) were used to assess the constructs of fatigue and cognitive failures. Results indicated that physical and mental fatigue significantly positively predicted cognitive failures. Findings based on 2x3 ANOVA showed that female employees with lesser job experience exhibited higher levels of mental and physical fatigue and cognitive failures as compared to male employees with extended job experience. Additionally, employees working in international pharmaceutical companies displayed elevated levels of physical fatigue, mental fatigue, and cognitive errors as compared to their counterparts. It was concluded that physical and mental fatigue are significant predictors of cognitive failures in workplace setting of pharmaceutical companies. Being a female with lesser job experience puts an individual at higher risk of developing fatigue whereas; employees in international pharmaceutical companies at a greater risk for experiencing fatigue and cognitive failures.

***Keywords:*** cognitive failures, mental fatigue, physical fatigue, pharmaceutical companies' employees

## Introduction

An operational or functional workplace is that which requires the effective and continuous workers' performance in order to successfully

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thrive, because, if any unit (human) of this workplace fails to perform its duty, the whole operation falls apart. Workers rendering their services in manufacturing and service-oriented firms suffer various mental and physical infirmities, which can compromise their ability to perform their assigned tasks by interfering with their physical and mental health (Bubonya, Cobb-Clark, & Wooden, 2017). Over the last decades, workplaces have been evolved and placed more demands on workers for which managers need to understand and intervene multiple physical and psychological determinants that may influence several work-related outcomes. With reference to job execution, a parallel stream of research (Carrigan & Barkus, 2016; Fan, Zhao, Luo, & Zhang, 2019; Kazemi, Karimpour, Shahriyari, Hossaini, 2017) highlighted the need to investigate employee related factors that has imperative influence on their work performance. In lieu to this, Ho et al. (2013) emphasized on the basis of systematic review that fatigue and exertion have surfaced as the preliminary and most influential factor that may play pivotal role in the execution of tasks. Later, Deligkaris, Panagopoulou, Montgomery, and Masoura (2014) equally emphasized the role of cognitive perceptions and skills which are observed at the workplace are likely to be taken into account to determine their precursors. Fuller (2005) further argued that incompatibility between task demands and employees' capacity can lead to cognitive failures and can be hazardous at workplaces where safety is needed in the execution of occupational responsibilities. Therefore, present study is designed to undertake the predictive role of mental and physical fatigue in shaping cognitive failures that maybe a great point of concern for the optimal functioning of any organization.

## Literature Review

Fatigue is described as decrease in physical performance associated with an increase in the perceived difficulty of a task (MacInstosh, Gardiner, & McComas, 2005) and reflect subjective experience of tiredness or lack of energy (Ahola & Hakanen, 2007). Fatigue has an unpleasant quality; which is not necessarily related to exertion and is not easily restored by rest or sleep (Beutel, Hinz, Albani, & Brähler, 2006). Several studies (Chow, 2018; Guo, Ren, Wang, & Zhu, 2015) have illustrated that employees do not stop working even when they feel strain which makes them more susceptible to the fatigue related ailments. Categorization of fatigue is based on the nature of fatigue that is physical and mental (Eddy, 2015) which is the most commonly experienced types by workers and people performing occupational

obligations. Recent line of studies (Fan & Smith, 2020; Mohammady, Sedighi, Khaleghdoost, Nejad, & Javadi-Pashaki, 2020) demonstrated that mental and physical fatigue also bears the added element of being two distinctive, yet, interconnected modalities of the human body. Undue load or overwork can lead to physical fatigue which indicates itself in the form of physical pain, cramps, or tiredness whereas; mental fatigue is the result of cognitive workload leading to inefficiency of the individuals in performing cognitive tasks (Chaudhuri & Behan, 2004). Generally, mental fatigue is identified with subjective feelings of tiredness and energy loss which results from continuously working on a cognitive task. On physical level, fatigue appears in the form of bodily weakness or decrease in responding of body cells and muscles in response to stress, exertion, effort, or over stimulation of muscles (Hirshkowitz, 2013). Another relevant way to look at fatigue in any individual is to gauge the performance on the task in hand. Thus, industrial researchers (Jalilian, Shouroki, Azmoon, Rostamabadi, & Choobineh, 2019) has also described fatigue in terms of the performance parameters of decreased performance, inability of manipulation, to maintain focus, recalling or retrieving things from memory.

The construct of cognitive failures has been variously explained in the relevant literature. Generally, cognitive failures are defined as the breakdown in mental functioning of an individual which makes the individual to make an error or mistake in execution of a routine task which that individual is capable of executing otherwise (Payne & Schnapp, 2014). The cognitive perspective provided helpful understanding about human error typology. For instance, Reason (as cited in Corcoran, Devan, Durrant, & Liddle, 2012) classified human errors in three major categories that is; slips (errors of execution), lapses (errors of storage), and mistakes (errors of planning). Errors are a by-product of human information processing or cognitive functioning of humans (Parker, Reason, Manstead, & Stradling, 1995). Thus, cognitive failure rates may be an indicator of the information processing capacity of humans and could therefore influence the performance of the task. Wallace & Chen (2011) suggested the most pragmatic and basic classification of cognitive failures in terms of different types of lapses; that is, lapses in attention (failure in perception), memory (failure related to information retrieval), and motor function (performance of unintended actions); with varying degrees of severity and intensity producing diverse consequences. There are different factors which can contribute to the experience of the cognitive failures. At a

workplace setting, primarily the environmental experiences of the employees can exacerbate the chances of cognitive failures at workplace.

*Theoretical Framework*

Numerous studies have provided direct and direct evidences regarding predictive role of fatigue in determining cognitive failures. For instance, Belenky et al. (2014) stated that fatigue of any sort may cause error, incident or accident; while, organizational aspects such as safety culture, shift scheduling practices and an absence of a proper fatigue-management risk plan may also contribute towards the fatigue among the professionals. Likewise, research (Hasanzadeh, Sogand & Esmaeili, 2018) indicates that mental fatigue reduces the vigilance leading to attention related lapses. Additional set of studies (Corcoran et al., 2013**)** revealed that mental fatigue has the potential to affect the cognitive processes of the individuals; in which attention is the very first cognitive process which can be affected associated with potential to deteriorate the memory related functioning of the individuals on a memory search task. Chow (2018) found that people suffering from mental fatigue experienced trouble in sustaining concentration and reduced ability to execute vigorous tasks due to loss of motivation and tolerance to physical fatigue related signs. Klockner, Karen, and Hicks (2015) identified lower levels of mindfulness, emotional instability, and physical exertion as precursors of workplace errors, including memory lapses, blunder and distractions. On the basis of these evidences, the following assumption is formulated:

*H1. Mental fatigue and physical fatigue will positively predict memory, attention, and execution related cognitive failures.*

Notably significant number of studies has been undertaken which have highlighted the imperative role of type of organizations in relation to study variables. For instance, Elfering, Grebner, and Dudanwhich (2011) declared that environmental and contextual factors prevailing in the private and public organizational setups had grave impact on generating experiences of emotional labour and physical fatigue level which subsequently regulate the task performance. Studies (Fan et al., 2019; Gou et al., 2018) concluded that environmental factors practiced in public and private sector organizations have the potential of making workers to cognitive errors. Recently, Kalakoski (2020) affirmed that job design exercised in multinational companies operating in private sector is often

supplemented with additional job-related stress and strain resulting in increased emotional exertion leading to cognitive and behavioral task failures. Mahdinia et al. (2017) illustrated that psychological and physical demands posed by work environment of international companies functioning in private sector has detrimental influence on its workforce including augmented levels of emotional strain and exhaustive cognitive resources. On these grounds outlined by the aforementioned evidences, the following assumption is phrased:

*H2. Employees working in international pharmaceutical companies are likely to express higher levels of mental and physical fatigue and cognitive failures as compared to those working in national pharmaceutical companies.*

Numerous studies have explored various demographics such as gender, age, education, job designation, and work experience in relation to mental fatigue, physical fatigue, and cognitive failures. However, gender and job experience are the two demographics which have been rigorously focused in the empirical investigations. For instance, Sholihah and Fauzia (2013) inferred on the basis of Indonesian workers at an airport terminal in the night shift, that female workers' fatigue is related to their shift timing and pattern resulting in augmented experiences of physical and emotional fatigue as compared to their male counterparts. On similar note, Jalilian et al. (2019) demonstrated that women reported enhanced tendencies of work-related stress, corresponding exhaustion along with contagion of personal emotions resulting in cognitive errors. On the parameter of job experience, Turner, Chmiel, and Walls (2005) asserted that extended experience is often associated with job related efficacy and efficiency which help the employees to develop better skills to adapt their work environment; thereby reducing their physical and mental effort and enhances their cognitive functioning. In addition, Wallace and Vodanovich (2003) considered extensive work experience and learned skills as positive and protective feature which acts favorably for the nursing staff to safeguard them from experiencing any task related errors. On the other hand, Kołodziej, Sabina, Ligarski, and Mariusz (2017) found that new employees are in constant condition of role ambiguity ensuing emotionally demanding, mentally laborious, and psychologically exhaustive. Consequently, newly inducted staff is likely to face occurrences of lapses in cognitive functioning and execution of tasks. Min, Min, and Hong (2018) explored effect of physical fatigue on the employees of a production line concluded that the workers with minimal experience at work were inclined to be more exhausted after their shift

resulted in the lowest productivity and glass breakage. Originating from the above mentioned adequate pragmatic support, the following hypothesis is proposed:

*H3. Female workers with lesser work experience are more likely to display mental fatigue, physical fatigue and cognitive failures as compared to their counterparts.*

*Rationale of the Study*

There are various reasons that serve the basis in designing the present study. Foremost, the notion of fatigue as a uni-dimensional construct has been extensively investigated; however, literature is quite silent about the types of fatigue which may bear diverse influences on the mental and behavioral functioning of the individuals. Therefore, the current study attempted to highlight two types of fatigue and its relative impact on cognitive tasks of the employees. In addition, though, ample pragmatic evidences shed light on the determinants of emotional and behavioral outcomes of the workers which ultimately shape their job performance. However, there is scarcity of empirical investigation to focus on the predictors of cognitive and mental skills; hence, this study strived to address this gap by highlighting the impact of cognitive failures and its types so as to capture the real essence of the cognitive functioning. Another reason that serve the basis for designing this study is to focus on the relatively under researched organizational setup that is pharmaceutical companies. In Pakistan, sufficient explorations have been done on various organizational setups such as telecommunication, banking sector, hospitality management, and manufacturing industries; but here is strong dearth of empirical studies that targeted on the nation's one of the most growing industry.

## Methodology

*Sample*

In order to fulfill the purpose of the current research, a sample of 406 employees was taken from different pharmaceutical companies through purposive sampling technique. Respondents included both men ($n$ = 335) and women ($n$ = 71) with age range 0f 22-55 years ($M$ = 33.45, $SD$ = 4.81) with minimum educational qualification of graduation. Overall, work experience of the respondents ranged from 1-25 years ($M$ = 10.11, $SD$ = 6.01); while job period in the present organization ranged from 1-12 years ($M$ = 7.22, $SD$ = 3.55). Participants were acquired from both national ($n$ = 215) and international ($n$ = 191) pharmaceutical companies rendering their services in four different departments including Sales/Marketing ($n$ = 168), Production/Distribution ($n$ = 95), and HR ($n$ = 48) departments.

*Research Design*

The present research used cross-sectional survey.

*Instruments*

The following two measures were employed to appraise the study variables.

*Chalder Fatigue Scale*

In order to assess the mental and physical fatigue, Chadler Fatigue Scale (Chadler et al., 1993) was used. The scale consisted of 11 items with two subscales, that is, Physical Fatigue Subscale (7 items; α = .78) and Mental Fatigue Subscale (4 items; α = .72). Respondents rated each statement on 4-point Likert scale ranging from 1= less *than usual fatigue* to 4 = *more than usual fatigue* with possible score range of 11-44; where high score on each subscale reflect more presence of that type of fatigue. Chadler et al. (1993) reported reliability index of .91 of this scale.

*Workplace Cognitive Failures Questionnaire*

A 15 item Workplace Cognitive Failures Questionnaire (Wallace & Chen, 2011) was employed to measure various types of cognitive failures. The scale comprised of three subscales, that is, Memory Failure Subscale (5 items; α = .74), Attention Failure Subscale (5 items; α = .76), and Execution Failures Subscale (5 items; α = .73). Responses were acquired on 5-point Likert scale ranging from 1 = *completely disagree* to 5 = *completely agree* with possible score range of 15-75; whereas, high scores indicate high occurrence of cognitive failures. Wallace and Chen (2011) reported adequate reliability for the total scale (.88).

*Procedure*

Data was collected from Islamabad/Rawalpindi offices of pharmaceutical companies after taking permission from their head offices. Participants were individually approached and had the right to quit from their participation at any stage of data collection. Afterwards, respondents were graciously thanked and appreciated for their valuable participation in the study.

*Analysis*

Analyses of the research are as follow:

**Table 1** ***Multiple Linear Regression Predicting Cognitive Failures from Mental and Physical Fatigue (N = 406)***

| | | | | | 95% CI | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Predictors | *B* | *SE* | *β* | *P* | *UL* | *LL* | *R* | $R^2$ | $\Delta R^2$ | *F* |
| Memory Failure | | | | | | | | | | |
| Constant | 5.15 | 1.36 | | .00 | 2.48 | 7.83 | .37 | .14 | .13 | 16.89 |
| Mental Fatigue | .73 | .11 | .41 | .06 | 1.01 | 6.43 | | | | |
| Physical Fatigue | .66 | .06 | .39 | .00 | 2.15 | 5.40 | | | | |
| Attention Failure | | | | | | | | | | |
| Constant | 4.81 | 1.32 | | .00 | 2.21 | 7.41 | .40 | .16 | .15 | 19.96 |
| Mental Fatigue | .79 | .11 | .37 | .00 | 1.18 | 4.61 | | | | |
| Physical Fatigue | .61 | .06 | .33 | .00 | 1.09 | 3.34 | | | | |
| Execution Failure | | | | | | | | | | |
| Constant | 5.52 | 1.40 | | .00 | 2.48 | 7.98 | .35 | .12 | .11 | 14.77 |
| Mental Fatigue | .45 | .11 | .21 | .00 | 0.17 | 2.63 | | | | |
| Physical Fatigue | .40 | .06 | .27 | .00 | 1.05 | 4.31 | | | | |

Table 1 shows Multiple Linear Regression analysis to examine the predicting role of mental and physical fatigue in determining three types of cognitive failures. Results indicate that mental and physical fatigues are significant positive predictors of memory, attention and execution related cognitive failures. Overall, model explains that both types of fatigue explains 13% variance in memory failure; while, 15% variance is accounted for in predicting attention failure; and variance of 11% is explained in predicting execution failure from both types of fatigue. These findings provide substantial support for H1.

**Table 2** ***Differences on Type of Organization across Fatigue and Cognitive Failures (N = 406)***

| Variables | National (*n* = 224) | | International (*n* = 182) | | *t* (403) | *p* | *95% CI* | | Cohen's *d* |
|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | | | *LL* | *UL* | |
| Fatigue Total | 9.49 | 5.16 | 13.99 | 4.63 | 2.74 | .00 | -4.79 | -1.80 | .38 |
| Physical Fatigue | 3.30 | 3.70 | 7.76 | 3.43 | 2.14 | .01 | -5.48 | -1.39 | .33 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Mental Fatigue | 3.18 | 0.26 | 6.23 | 0.76 | 2.17 | .01 | -3.51 | -1.61 | .31 |
| Cognitive Failures | 29.79 | 9.94 | 33.20 | 10.77 | -3.30 | .00 | -5.43 | -1.37 | .46 |
| Memory Failures | 10.26 | 3.89 | 11.41 | 4.00 | -2.91 | .00 | -1.92 | -0.37 | .41 |
| Attention Failures | 10.00 | 3.50 | 11.25 | 4.24 | -3.24 | .00 | -2.00 | -0.49 | .35 |
| Execution Failures | 9.53 | 3.98 | 10.53 | 4.16 | -2.48 | .01 | -1.80 | -0.20 | .32 |

Results presented in Table 2 indicate significant differences on type of organizations (national and international) along study variables. It has been found that employees working in international pharmaceutical companies expressed higher levels of mental and physical fatigue as compared to those working in national pharmaceutical companies. Likewise, employees rendering their services in international companies of pharmacy reflected elevated levels of memory, attention, and execution and over all cognitive failures as compared to their counterparts; thereby, offering empirical support for H2.

As significant group differences are found on the demographics of gender and job experience; therefore, on principle of parsimony, multivariate analysis of variance was tabulated to determine the combined effect of gender and job experience.

**Table 3** ***2 x 3 Analysis of Variance for Gender and Job Experience Across Study Variables (N = 406)***

| Predictors | Sum of Squares | *df* | Mean Squares | *F* | *p* | Partial $\eta^2$ |
|---|---|---|---|---|---|---|
| Intercept | 264480.96 | 1 | 264480.96 | 2790.66 | .00 | .87 |
| Gender | 3751.32 | 2 | 1875.66 | 19.79 | .00 | .09 |
| Job Exp. | 137.075 | 1 | 137.07 | 14.49 | .00 | .00 |
| Gender x Job Exp. | 863.288 | 1 | 863.28 | 9.10 | .00 | .02 |
| Error | 38004.15 | 401 | 94.77 | | | |
| $R^2$ | .14 | | | | | |
| Adjusted $R^2$ | .13 | | | | | |

*Note.* Exp. = Experience

Results given in Table 3 shows combined effect of gender and job experience (Group 1 = 1-5 years; Group 2 = 5.1-10 years; Group 3 = 10.1 years and above). Findings indicate that female employees with lesser job experience expressed higher levels of fatigue and more experiences of cognitive failures as compared to male employees with advanced work experience; hence, proposing partial support for H3.

*Discussion*

Findings of research indicated that physical and mental fatigues are significant positive predictors of memory, attention and execution related cognitive failures. These findings can be best explained in the context of job demand-control-support model (Jalilian et al., 2019) which emphasized the role of work stressors and corresponding function of fatigue, tiredness and exhaustion on job related behaviors. Hsu (2019) also deliberated that any kind of weariness and physical exertion is negatively linked with perceived control and enhanced accidental errors in execution of managerial tasks. Additionally, Guo et al. (2018) asserted that mental fatigue can cast adverse effects on cognitive functioning of fatigued people as mental fatigue generates response inhibition by slowing down the mental processing and analytical aspect of thinking which, in turn, likely to augment cognitive failure. Recent evidences (Mohammady et al., 2020; Kalakoski, 2020) inferred through their experimental study that fatigued people experience cognitive strain which initiate unhealthy impact on the overall wellbeing and functioning level of the individuals. In regard to organizational settings, numerous researches (Kaur et al., 2018; Fan et al., 2019; Mahdinia et al., 2017) concluded that intensity and duration of the physical exertion is the major predictor of generating adverse aftermath in terms of cognitive, affective, and behavioral malfunctioning. On similar note, Guo et al. (2015) found that physical fatigue may mingle with mental fatigue and bring about decline in cognitive efficiency and apparently simple physical tasks (like standing and walking) also need attention demands and prolonged attention demands for physical activities may reduce attention on other cognitive tasks and an individual may face disruptions in other cognitive tasks. Eddy et al. (2015) articulated that employees working in production units (making medicines, their coating, packaging, and distribution) involved in rigorous physical activities tend to experience elevated levels of physical fatigue and correspondingly report higher physical exertion and declined cognitive performance.

Findings further revealed that employees are working in international pharmaceutical companies reflected higher levels of mental

and physical fatigue and more experiences of cognitive failures. This pattern of results found reasonable support within the paradigm of differential creative supervisory management (Carrigan & Barkus, 2016). This paradigm holds that as the world is becoming more global enterprise, the multinational companies are facing the utmost echelon of competitive edge which gives them an economic boost and sustenance over the local markets. These universal companies are in constant state of pressures and demands to meet the subsequent emerging market goals. Therefore, it has been rigorously established in previous studies (Chaney & Fogarty, 2009; Chow, 2018; Corcoran et al., 2013; Payne & Schnapp, 2014**)** that employees working in multinational companies tend to report upper level of work stress, job related burnout, and even turnover intentions. On indigenous front, these findings are formerly recognized by handful set of studies (Akram & Haider, 2016; Batool, Afzal, Khakwani, & Khan, 2018; Tayyab & Kawar, 2017) which shows that workers of multinational companies operating in Pakistan expressed enhanced task related strain, physical and emotional fatigue, psychological distress and lower levels of organizational citizenship beahviour, career satisfaction, and employment security.

Results also show that combined effect of gender and job experience is significant personal demographics to influence the study variables. It has been found that female employees with lesser job experience articulated more mental and physical fatigue and higher inclinations of cognitive failures as compared to male employees with more job experience. This pattern of finding is plausibly endorsed by earlier studies (Agbenyikey et al., 2015; Mahoney et al., 2012; Wilhelm et al., 2010) stating that gender differences does exist on various indicators of mental, emotional and behavioural aspects of work life. These studies further articulated that women workers have reported overindulgence with their multiple social roles both at home and administrative commitments, which, in turn, renders more job-related strains on them. These pressures and demands make them highly vulnerable to physical exertions and emotional exhaustions with subsequent cognitive decline in managing their tasks. On the basis of meta-analysis, Hsu et al. (2019) inferred that contradictory findings are reported in the literature regarding gender differences. On one hand, female workers are found to be high on the indicators of compliance, genuinety, and integrity; conversely women does endorse elevated rate of physical weariness, emotional labour and poor social support both at home and official front. In addition, job experience is a much-examined demographic especially in corporate (Gau

et al., 2018) and banking (Winwood et al., 2005) sectors. Numerous studies (Jalilian et al., 2019; Kaur et al., 2018) conclusively asserted that with task experience, employees become more capable to handle their official obligations and responsibilities, leadership skills, and interpersonal conflict resolution strategies with effective time and energy management. Conversely, employees at entry level positions often reported problems in managing their time and carrying out their roles with maximum potential. Mahdinia et al. (2017) suggested role ambiguity framework which present handicap to the fresh employees to adjust their capabilities to the new work environment and subsequently, experienced more mental exertions and work errors due to lack of attention and execution skills. On a final note, Mohammady et al. (2020) demonstrated that employees with extended work knowledge and experience are found to report better time management and lesser subjective workload which helps them to manage their physical exertion and lesser chance of occupational cognitive and behavioural malfunctioning in executing their tasks in comparison to those with fewer temporal adherence in the current workplace.

*Limitations*

There are few potential limitations which may be guarded while inferring the findings of the present study. Firstly, only self-reported measures were used which may induce the possibility of response bias. Therefore, future studies may prefer to employ more qualitative techniques (such as interviews and focus group discussions) to offer more response variability. Secondly, sample was approached only from Rawalpindi and Islamabad based offices of pharmaceutical companies which may limit the generalizability of the findings. Hence, it would be more appropriate that future endeavours would consider data from other cities of Pakistan. Thirdly, the primary design of current research is cross sectional which may hinder the inclusion of various demographics; whereas upcoming investigations would consider the possibility of using longitudinal designs so as to derive in-depth data. Finally, influence of other related constructs (such as personal dispositions, managerial support, and leadership styles) in relation to fatigue and cognitive failures would be explored in forthcoming investigations to draw comprehensive inferences about the phenomenon.

*Implications*

There are multiple implications of the present research which bear both theoretical and pragmatic applications. Firstly, findings offer baseline information in understanding the theoretical connections between specific types of fatigue and cognitive failures in the context of organizational settings. Secondly, inferences drawn from the current study offer useful insights into the significant demographics of employees (such as type of organization, gender and job experience) which can be catered by HR practitioners while designing jobs and outlining job descriptions. Thirdly, results of the study can be utilized in devising intervention plans for employees who are experiencing mental or physical fatigue at their workplaces and improving their skills of attention and cognitive skills. Finally, findings of the study would offer fundamental information for designing customized organizational modules which would enhances the cognitive, emotional and behavioural capacities of the employees.

*Recommendations*

While considering the results of the current research, pharmaceutical companies must initiate on-job training for less experienced individuals. Policy should be made in order to cater the physical and mental fatigue of the employees which may include introduction of frequent short breaks and job rotation.

*Conclusion*

It can be concluded that physical and mental fatigue are significant predictors of cognitive failures and its subtypes among employees of pharmaceutical companies. Being a female with lesser job experience is another factor for developing fatigue whereas; employees in international pharmaceutical companies are at a greater risk for experiencing fatigue and cognitive failures.

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