



## IMPACT OF WORKPLACE ENVIRONMENT ON EMPLOYEE PERFORMANCE: MEDIATING ROLE OF EMPLOYEE HEALTH

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**Abstract.** *Purpose* – Purpose of current study is to explore, impact of workplace environment i.e Physical Environmental Factors and Behavioral Environmental Factors on employee productivity (EP) through mediating role of employee health (EH).

*Research methodology* – This study adopted questionnaire survey method and data was collected from 250 employees working in software houses in Pakistan. Data has been analysed using SPSS and AMOS software. Reliability and correlation analysis was performed by using SPSS while; path analysis was performed using AMOS.

*Findings* – Results revealed that one unit variance in PEF incorporates 35% change in EH, 33% change in EH is caused by one unit increase in BEF and one unit increase in EH leads to 80% increase in EP. Physical and Behavioural Environmental Factors are positively affecting EH and EH is positivity affecting EP. Results of the study revealed that: employee health is mediating the relationship between workplace environment factors and employee performance.

*Research limitations* – We used working Environment factors to determine employee health; future studies can consider compensation practices, insurance plans and health benefits by the organisation, a large sample or increased number of mediating variables can be used. The current study has adopted cross-sectional design while future studies can consider longitudinal design.

*Practical implications* – Organisations must maintain a better environment in order to enhance employee productivity as, employee performance and workplace environment have direct and positive relationship, employees productivity and physical as well as behavioural environment are linked through employee health.

*Originality/Value* – However, most of the previous studies in this field only highlighted positive dynamic indicators of these indicators and neglected the quantitative changes, the current study is an attempt to obtain a quantitative measure of responses in the given context.

**Keywords:** Physical Environment Factors (PEF), Behavioural Environment Factors (BEF), Employee Health (EH), Employee Performance (EP), and IT Industry.

**JEL Classification:** I12, J81, K32, M10.

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## **Introduction**

In a typical working environment, significant components are physical and behavioural constituents. Elements which are associated with employee's aptitudes to attach physically with the office environment are called as physical environment. While the office occupier etiquettes with each other are interconnected through the behavioural environmental components. Office environment positively affects the behaviour of individual employees. Thus, the excellence of working environment act as an essential function in determining the level of employee and worker motivation, productivity, and performance (Sharma, Dhar, & Tyagi, 2016). How well employees are affiliated to an organisation, affects how employees behave within an organization settings including: their motivation level, innovative behavior, absenteeism, interaction with other employees and job retention. Employee productivity is the most significant interest nowadays, and it is affected by the working environment in many ways (Mwendwa, McAuliffe, Uduma, Masanja, & Mollele, 2017). It can play a positive or negative role depending on prevailing physical conditions in the working environment. In developing countries, most of the workplace environment in industries is insecure and harmful. Healthy and safe working environment can take a very central role in increasing productivity; unfortunately, most of the employers consider it as an extra cost and do not spend much on maintaining comfortable working environment (Thobaben & Woodward, 1996). Furniture design, ventilation, noise, light, supervisor support, workspace, communication, fire safety measures affect employee productivity (Eberendu, Akpan, Ubani, & Ahaiwe, 2018).

Software houses are the companies, where main workings are related to computer or mobile applications designing and development. Software development requires highly skilled employees with technical expertise in understanding the requirements. The World leading software organisations include Microsoft, HP, Apple, and Oracle Corporation, which develops software and distribute worldwide. There are also a lot of international and local software organisations as well. As a rising group software houses engineers, developers perform the crucial role in the new technological industry, so they need to have a working place with open decision-making environments where they have a prosperous role in decisions (Kaur & Sood, 2015). On behalf of the business dictionary, work environment and all its surrounding which influence the employees in the working position, and it primarily means working condition, which has two main components: physical environment and behavioural environment. A well-structured and grand organisation looks after and maintains the needs of their employees. Vigorous workers in grand organisations achieve peak performance and maintain the organisation value (Kiyatkin & Baum, 2012).

Employees are working in insecure and unhealthy environment pretentious occupational disease due to the negative influences of the environment on their performance, which affects the overall productivity of the organization (Chandrasekar, 2011). Employees are facing grave environmental troubles in their related workplace, especially in the software industry, which causes complexity in supplying essential amenities to ameliorate their level of performance. In a recent study, we have evaluated the performance of software houses employees of Pakistan in the existence of such workplace physical and behavioural environmental factors. The consequence of chosen factors has been tested on their physical health condition that eventu-

ally influence their performance. Thus the primary goal of the research is to investigate the components of working and behavioural environment which have influences on employee performance and to understand impact of both working environment and behavioural factors, on employee health in IT industry. This research has also evaluated the employee health impact on workers performance. However, in most previous works on this topic, only the fact of the positive dynamics of these indicators is noted, but not their quantitative changes. The novelty of the article under consideration is an attempt to obtain a quantitative measure of responses.

In major cities of Pakistan, especially Islamabad and Rawalpindi, there are many familiar software houses. Mostly the environment of these software houses play an imperative role in determining employee performance. This study has followed the working condition defined as the work-place environment and has set terms, and conditions characteristics of the employees which are associated to employees (Samaranayake & Gamage, 2012). In 2002 software industry under the ministry of broadcasting and information emerged. Available statistic up to 2007 illustrates that there were total 11,000 professionals of IT and 1,105 registered number of software houses. In 2006, the country was taken economic benefit up-to US \$1050 million from IT services while the local IT industry reached revenue up to US\$ 1,150M and the returns from Business Process Outsourcing (BPO) was US \$1,200M (Raheem et al., 2014). As per entire valuables statistical figures (Kaur & Sood, 2015), the entire Information Technology (IT) and Information Technology Enabled Services (ITES) diligence per year, producing revenue of about US\$ 2 Billion. In 1996 the first time after introducing the internet, the software market grown up at very rapid pace and became one of the improvement factors in Pakistan IT industry. Besides, for the establishment of IT industry, organisation of Pakistan Software Export Board (PSEB) established in 1995 and Pakistan Software Houses Association was started in 1992 (Hasan, Moin, & Pasha, 2019). While in March 1997, the SandIT (Software and Information) was declared as a separate industry which has played an important role in advancement of the of IT industry in Pakistan. In 2017 the undocumented IT export of Pakistan was about up to little over \$ 2.8 billion.

Main objectives of the proposed study are: to explore what are the components of Physical Components of working environment and what are its Behavioural components; to study the effect of physical and behavioural environment factors on employee health; to find the relationship between consequences of working environment and employee performance; to examine the moderating role of employee health on the relationship of workplace environment and employee performance; and to develop scale for measuring consequences of interrelationship between employee working environment and their employee performance.

## 1. Literature review

*Workplace Environment:* Workplace environment is an important component of work life for employees as employees spend significant part of their time at work, and it affects them in one way or the other. It is concluded that the employees who are satisfied from their work environment can lead towards more positive work outcomes (Kamarulzaman, Saleh, Hashim, Hashim, & Abdul-Ghani, 2011). Previous researchers found that, several environmental

factors such as noise, colour, temperature, workplace design and use of indoor plants influence employee performance and well-being. They also have suggested that future researches can be carried on the relationship using working environment and employee productivity. They also suggested that comparative studies can be conducted between the office environment of government and private offices. They found that working environment is essential, as in a comfortable environment employee can focus on their job correctly, and it leads to a better employee performance, which leads to improved organisational productivity (Kamarulzaman et al., 2011). An environment that focuses people and has stirred them to be in its workforce, provide them the prospect to perform efficiently, is called attractive environment or supportive environment and it helps to produce recruitment and keep on in occupation (Awan & Tahir, 2015). Attractive work atmosphere and supportive environment give increase to the circumstances in which employees put together their preeminent use of skills, competences, and knowledge to execute efficiently. Organisations should invest more in providing quality services to the customers (Mbembati, Mwangu, Muhondwa, & Leshabari, 2008).

Modern workplaces of IT and software houses physical environment is surrounded by computers, printer, machines, and different types of machines. Due to constant interaction with technology, an employee's brain is filled with sensor information. In an organisation, it is made sure that there has a conduciveness of physical environment according to organisation requirements for facilitating informality, privacy, crosses disciplinarily, familiarity, and communication: these factors motivate employees to achieve higher level of organizational commitment, that ultimately leads the organization towards improved performance (Iqbal, 2008).

*Employee Performance:* employees within an organization can be motivated in different ways in order to get maximum output and productivity, these rewards can be intrinsic or extrinsic. Internal rewards are usually for accomplishing challenging assignments, and internal rewards are given for accomplishing challenging assignments, and external rewards cover honorable recognition or sophisticated compensation (Chandrasekar, 2011).

Motivating employees for goal setting is another essential tool (Goerg, 2015). This form of employee motivation eventually improves their performance and enhances the productivity level of the organisations. There are two primary purposes of goal setting, one is to improve the individual's behaviour, and second is to motivate them at a high level further that they perform well with effectiveness. The specific goal is more effective than generalised goals. Furthermore, high performance is achieved through challenging goals as compared to an easy goal. With acceptance, practical goals, existences encourage and open communication (Joshi & Sarda, 2011). Another essential component of the behavioural factor is attitude and organisational justice. Prior researches have demonstrated the three most crucial eminent dimension of the organisation. First, one called interaction justice is defined as justice between the employees and communication way of the employee to each other in work time, politeness, respect, and dignity have defined the different degree of treatment with each other. Second called procedural justice concerning the fairness making in the decision taken. The last one is distribution justice, regarding perceived fairness in rewards and costs sharing among the team members in connections of equity and equality (Chotikamankong, 2019; Vimalanathan & Babu, 2013).

*Workplace Environment and Productivity:* Based on previous researches, it can be determined that in the organisation, the working environment is significant and has a high impact on employees with different aspects. If organisation environment does not attract the employees and they have a negative perception of different workplace environment elements like absenteeism, performance, stress-related illness, and productivity, then eventually their obligation has reduced to a low level which in turn affects the organisation productivity and augmentations (Cottini & Ghinetti, 2012). However, if the organisation environment is friendly, safe, and trusted, it impacts employees positively and their performance, creativity, productivity, commitment, and financial health drive high, which also influences the organisation augmentations. Hence, Bhatti (2018); Mattson, Melder, and Horowitz (2016), illustrated that the environment of the workplace had enhanced consequences by motivating employees.

*Physical and Behavioural Environment Factors:* The office environment has been defined in two main categories, i.e. Physical and Behavioural Environment. Work of various researchers and their consequences are given in the subsequent paragraphs. Gunaseelan and Ollukkaran (2012) worked on manufacturing sector and found that components of working environment affects employee performance. They took employee performance as the dependent variable and other factors like an interpersonal relationship, monetary benefits, employee welfare, safety, security and training and development, formalisation and standardisation, participative management, objective and rationality, supervision, and scope of advancement as independent variables. They used a random method of sampling for selecting of target respondent. From 100 employees, primary data was collected using 5 points Likert scale questionnaires, and percentage analysis was applied. The analysis concluded that employees are less attracted to place more efforts for enhancing productivity without the appropriate prospect of promotion in the organisation. Further, the results revealed that other factors like a safe working environment, monetary packages, and the impact of rewards, training facility, recognitions, and job security have positively influenced employee's performance.

Naharuddin and Sadegi (2013) found in their research that the workplace environment significantly impacts the performance of the employees. They used survey-based data collection method from 139 employees and revealed that supervisor behaviour is not enough for the improvement of employee, a well-organised workplace physical environment and additional benefits including different kinds of job aids significantly influence employee performance. Naharuddin and Sadegi (2013) studied the interrelationship between job performance, job aids and physical working environment and supervisor support. They used the stratified random sampling technique and picked different employees from numerous departments and levels of the organisation including: Head Quarters, Tooling Plant and Stamping Plant. Data from 139 participants among, 200 was collected and regression analysis was performed for testing three aforementioned measured variables. The analysis results of Beta, negative relationship was found between the supervisor support and the employee performance, which showed that there was not much significant effect of supervisor on employees. Leblebici (2012) conducted their research on a foreign bank in turkey and analyzed the working environment conditions in relation to employee productivity, they carried out their research using secondary data. Workplace environment consists of physical

and behavioral environmental factors. They considered Physical components consisting of: natural light, cleanliness, ventilation, heating/cooling facilities, comfortable working environment, informal meeting area, office layout, working desk/ area and general and personal storage space. Behavioural components included: creative physical environment, distraction, social interaction and office layout in terms of ease of working. They found that healthy behavioural workplace condition yields positive consequences on employees even if physical environmental conditions are unfavourable, another finding of the study was: behavioural components of working environment affect employee performance more significantly than physical components.

Haynes (2008a) argued that organization productivity can be improved 5% to 10% by upgrading physical design of workplace, this increased organizational performance is actually a result of enhanced employee performance. A number of researches have been conducted on the investigation of effects of physical environment on employee participation towards work, employee performance and loyalty towards organization. Samaranyake and Gamage (2012) found that positive correlation exists between job satisfaction and personal judgement of effectiveness with reference to perceived relevance to work

*Employee Health:* Kelloway, Weigand, McKee, and Das (2013) have a focus on working related health issues to software developer professionals of India and USA and resulted that factors like rest break time, working hours, and exercise is the main issues that influence the health of employees. They further revealed that the most crucial health problems faced by employees in both India and the USA are eye strain, headache, general fatigue, and back pain.

Shahzad, Iqbal, and Gulzar (2013) in a survey-based research study, analysed how organisational culture affects employees work performance. They conducted their study on different software houses in Pakistan. They carried out their research by collecting primary data on organizational culture by using five aspects of organizational culture including: innovation and risk taking, customer services, reward systems, communication systems and employee participation. They analysed the data by performing correlation and regression analysis. SPSS software was used for data analysis, sample size was 110. Results of the study revealed that there is positive relationship between organizational culture and employee performance and there exists positive relation between job performance and working environment. Study also revealed that, employee commitment and participations leads towards enhanced organizational performance (Shahzad, Iqbal, & Gulzar, 2013).

A summary of the literature review has been given in Table 1:

*Ecological Systems Theory:* Ecological systems theory also known as person-in-environment theory states that:an individual in a specific environment has a vibrant relationship with their social, physical and natural environment (Barnett & Gareis, 2006) and this theory also suggests that work and life are interconnected, one part has its effect on the other part in terms of processes, time, context and time characteristics (Grzywacz & Bass, 2003).

*Social Exchange Theory:* Motivational process in organisations is carried out with the help of different social exchanges (Cook, Cheshire, & Gerbasi, 2006) Social Exchange Theory (Emerson, 1976) support from managers builds employee trust and as a result employees will be motivated which helps in developing positive attitude towards work and employee commitment level is enhanced as a result of which performance is enhanced. First-line managers

Table 1. Aanalysis of existing literature

Author Year	Target	Methodology	Conclusion
(Gunaseelan & Ollukkaran, 2012)	Investigated working environment factors which influence employee performance	<ul style="list-style-type: none"> <li>- Sample size (100)</li> <li>- random sampling</li> <li>- 5 points Likert scale</li> <li>- Data collected through questionnaire</li> </ul>	<ul style="list-style-type: none"> <li>- Adequate promotion opportunity influence performance of employees</li> <li>- Factors, i.e. job security, facility of training, monetary packages, rewards and safe condition of working also influence employee performance</li> </ul>
(Naharuddin & Sadegi, 2013)	Examined the impact of factors of workplace environment on performance of employees	<ul style="list-style-type: none"> <li>- Sample 139</li> <li>- Data collected through questionnaire</li> <li>- Data Analysis using SPSS</li> </ul>	<ul style="list-style-type: none"> <li>- No significant impact of supervisor support was found on employees performance</li> <li>- physical environment factors and job aid have significant influence on performance.</li> </ul>
(Imran, Fatima, Zaheer, Yousaf, & Batool, 2012)	working environment, trans-formational leadership	<ul style="list-style-type: none"> <li>- Sample 215,</li> <li>- Data collected using questionnaire</li> <li>- Data Analysis SPSS</li> </ul>	<ul style="list-style-type: none"> <li>- The conclusion resulted that work environment and transformational leadership have significantly positive impact on employee performance.</li> </ul>
(Mokaya, Musau, Wagoki, & Karanja, 2013)	Focuses on Kenya hotel industry and have checked the influence of working conditions on job satisfaction	<ul style="list-style-type: none"> <li>- Explanatory Resaech</li> <li>- Stratified sample (n = 84)</li> <li>- Survey Method</li> <li>- Data Analysis using SPSS</li> </ul>	<ul style="list-style-type: none"> <li>- For improving employees working skill, there must have development provision and opportunities for training from management to employees.</li> </ul>
(McGuire & McLaren, 2009)	Physical environment have impact on employee commitment	<ul style="list-style-type: none"> <li>- Sample size (65)</li> <li>- Data collection tool Questionnaire</li> <li>- Data Analysis - SPSS</li> </ul>	<ul style="list-style-type: none"> <li>- The study determined that for increasing the employee's commitment, with other physical environment working factors employees well-being needs to be measured</li> </ul>
(Shahzad et al., 2013)	Cultural Influence on Employee Performance	<ul style="list-style-type: none"> <li>- Sample Size (110)</li> <li>- Data collection through questionnaire</li> <li>- Data Analysis using SPSS</li> </ul>	<ul style="list-style-type: none"> <li>- organisation culture has significantly affects employee performance.</li> </ul>
(Leblebici, 2012)	Explored the workplace condition's impact on employee performance	<ul style="list-style-type: none"> <li>- Questionnire was used for data collection</li> <li>- Sample size (50)</li> </ul>	<ul style="list-style-type: none"> <li>- The study result revealed that unhappy employees due to the environment of work, have not better remarkable satisfactory results.</li> </ul>

usually manage human resources; they manage human resources with the ultimate objective of attaining organisational performance. Social exchange is a process between organisation and employees in which organisation values employee contribution and provide them with the necessary care and makes sure that their well-being level is achieved (Eisenberger, Fasolo, & Davis-LaMastro, 1990).

## 2. Research methodology

While exploring the element of job satisfaction, working environment again becomes a crucial factor. There are many elements of the workplace, including person-job fit, supervisor support, incentive plan, workload, training and development, which are considered as contributing factors (Raziq & Maulabakhsh, 2015). A mixed-method study was initially done by a descriptive cross-sectional with survey pursued through a qualitative approach, and it was found that there are many factors including work pressure, working teams absence, social support, erudition of employee, safety, recognition were concluded as significant factors and work environment resulted as the main causative factor towards job satisfaction between the health employees (Aziz, Kumar, Rathore, & Lal, 2015; Fadlallah, 2015). Chandrasekar (2011) have studied the working environment by considering various types of public sector organisations. In their research, they have a focus on employee level of performance in an interactive work environment of the organisation. They divided the organisation types into three different categories, engineering category, administration category, and shop floor category. Data were collected from 285 understudy employees by stratified random sampling method. Analysis results that they recognised seven factors which affect employee's attitude towards works at the workplace. According to their results, the first factor is emotional factors which have a high impact on the attitude of employees towards working environment, the others were an interpersonal relationship, job assignment, control over the environment, extensive work, shift, and the less effective one is above time duty. They further found that second category which affects employee performance is workplace physical aspect, like, office space, furniture's, materials and storages, and the last one, the working place interior space. The overall conclusion of their research resulted that to drive the employee's performance at peak, managers and supervisor should consider all aspects of the critical factors at work. Based on the literature hypothesis 1 of the study will be:

*Hypotheses of the Study:* The current study contains and tested the following hypothesis, which has derived from the previous literature and is also justified in the literature review.

*H1: Physical factors of the workplace environment are positively associated with Employee Health.*

To improve the performance of the employees for getting better commitment and results, assurance of the adequate facilities must be provided to employees. It results that at the workplace due to the harmful physical environment and inadequate equipment leaves terrible effects on employee's commitment and staying with the organisation for a long time due to affecting job satisfaction of employees and fairness perception in the organisation for employee's compensation. The conviction that works settings design, innovations and creativity have stronger influences on businesses and organisations improvement. Hedge

(1982) concluded that an open work environment creates more significant team interaction by providing a high level of flexibility due to the easiness of communication and access to interpersonal work sharing as compared to closed and reserved offices. The glowing working environments have helped in the collaboration among the staff member and higher productivity of the organisation, as well as with increased positive attitude towards job and job satisfaction (Dozie Ilozor, Love, & Treloar, 2002). Employee performance is also improved by taking participation in organisational decision-making processes. Different training and development programs also help the employee for creating new innovative ideas through which they are involved in the new methods of experimentation. According to (Gunaseelan & Ollukkaran, 2012) employee's performance is improved by paying them according to their expertise and experience. Hypothesis 2 is given as:

*H<sub>2</sub>: Behavioural factors of workplace environment are positively associated with Employee Health.*

Das (2012) explored and discussed the prominent health related issues commonly faced by software developers during their professional field. Recent studies described the factors badly affecting the developers health, common factors are tea breaks, gym classes for exercise etc. Because the study was related to sub-continent so more than 60 developers from different sub-continent countries were selected and the observations show that the most common issues in developer's health are eye strain, fatigue and backbone pain. Similarly recent studies show that blood pressure, cholesterol and diabetes are having not much concern at this point of time. From the recent studies it is very clear that number of overlapping of symptoms in health related issues (Gorin, Badr, Krebs, & Das, 2012). Based on the literature on employee health and productivity Hypothesis 3 of the study is driven as under:

*H<sub>3</sub>: Employee's Health positively influences Employee Performance.*

Shahzad (2014) studied the impact of organisational culture on the work performance of software houses in Pakistan. The author has focused on five various aspects of the reward system, innovation, employee contribution and communication system, customer services, and risk in organisational culture. They found that the performance of employees have a positive relationship with organisational culture and especially with the organisational environment. They further revealed that employee participation and commitment play a vital role in enhancing organisational performance. Samaranayake and Gamage (2012) have worked on the perception of employees associated with electronic monitoring of employees in the working environment and their influences on job satisfaction of software houses employees in Sri Lanka. They concluded a positive correlation of individual judgment of effectiveness with perceived significance to work and job satisfaction. Hypothesis 4 and 5 are given below:

*H<sub>4</sub>: Employee Health mediates the relationship between Physical Environmental Factors and Employee Performance.*

*H<sub>5</sub>: Employee Health mediates the relationship between Behavioural Environmental Factors and Employee Performance.*

Current research is survey-based and has used primary data; formal, informal form of interview and questionnaire are used for the collection of data. For research, both environmental factors, physical and behavioural are considered with employee's health condition, and employees work performance. The sample size of data is 250, and by using SPSS25

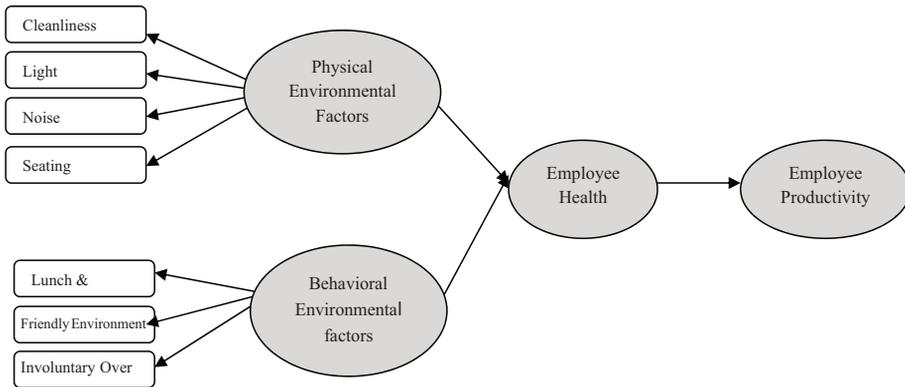


Figure 1. Proposed research model

and AMOS software, the correlation and regression method and path analysis are used for analysis.

*Research Model:* This research work has focused on the relationship between the working environment and employee performance. The Study based on the relationship among the working environment and the performance of employee. We took two main factors of working environment; the 1<sup>st</sup> factor that we considered is physical location in which (office lights, surroundings of office building, sitting arrangements of employee in office) and the 2<sup>nd</sup> factor behavioral (tea time environment, over time bonuses etc) In this study we calculated the effect of these factors on the developers life by gathering data from different software houses of Pakistan.

The framework of the research is depicted in Figure 1 given above.

*Research Design:* self administered structured questionnaires have been used to collect quantitative data. The unit of analysis was employees in software houses in Rawalpindi and Islamabad. It is a cross-sectional study. A sample of 250 employees from software houses was selected following a systematic random sampling technique.

*Data Collection:* A questionnaire-based survey has been adapted for collection of data. The questionnaire was in English and translated to Urdu and then again translated back to English with different three independent professional translators to ensure consistency (Hui & Triandis, 1985). The survey has been conducted through a self-administrative method from different software houses in Rawalpindi and Islamabad. Personally administered questionnaire technique was used to achieve maximum response. For analysis, SPSS software was used while for verification of the model path analysis (SEM) method in AMOS has been used.

### 3. Results

*Reliability Analysis:* Before conducting actual data analysis, reliability analysis was performed by collecting data from fifty respondents. Results of the reliability analysis were significant (Table 2). According to Hair, Ringle, and Sarstedt (2011) instrument is considered as reliable if it achieves the value of 0.70. All values fall in acceptance range and hence the study fulfils

reliability criteria. A pilot study is very crucial as it identifies a potential problem in the data before doing actual analysing and getting final results.

For scale reliability, Cronbach's Alpha has been used. Cronbach's Alpha is termed as a coefficient of internal consistency, and it is used to measure scale reliability. It is not considered a statistical test however, its results are used as a measure for scale reliability or internal consistency. If the value of Cronbach's Alpha is less than 0.6, it is considered less reliable. If the value is between 0.6–0.8, it is considered as moderately reliable and if it is between 0.8–1. In the current study, the sample size is 237. All four variables were used in reliability analysis. Physical Environmental Factors (PEF) consists of 16 items, and its Cronbach's (alpha) value is 0.972. Behavioural Factors (BF) contains six items, and Cronbach's (alpha) is 0.937. Employee Health (EH) having seven items and Cronbach's (alpha) value is 0.958. Employee Performance having seven items and Cronbach's (alpha) value is 0.904. It is confirmed that the Instrument is highly reliable with all the variables having reliability values over 0.8.

Table 2. Reliability statistics

Variable	Items	Cronbach's Alpha (Pilot study)	Cronbach's Alpha (Actual study)
Physical Environmental Factors	16	0.701	0.972
Behavioural Factors	6	0.732	0.937
Employee's Health	7	0.755	0.958
Employees Performance	6	0.719	0.904

*Correlation:* In the current study, Pearson's correlation has been applied as data was interval scale data. Pearson's correlation is defined as the covariance of two variables divided by the product of their standard deviations. Correlation values are given in Table 3. Value of coefficient of Pearson's correlation between Behavioural factors (BF) and Physical Environmental Factors (PEF) is 0.130, and this value is significant at  $p = 0.05$ . Between Employee Health (EH) and Behavioural Factors (BF), it is 0.382, and it is significant at  $p = 0.000$ . Pearson's correlation value for Employee Performance (EP) and Behavioural Factors (BF) is 0.331, and the results are significant at  $p = 0.000$ . Correlation value between Physical Environmental Factors (PEF) and Employee Health (EH) is 0.404 and is significant at  $p = 0.000$ . Correlation between Physical Environmental Factors (PEF) and Employee Performance (EP) is 0.342, and it is significant at  $p = 0.000$  level of significance and correlation between Employee Health (EH), and Employee Performance (EP) is 0.815, and it is significant at  $p = 0.000$ .

Table 3. Correlations

	Behavioural Factors	Physical Environmental Factors	Employees' Health
Physical Environmental Factors	0.130*	1	
Employees' Health	0.382**	0.404**	1
Employees' Performance	0.331**	0.342**	0.815**

\*. Correlation is significant at the 0.05 level (2-tailed) \*\*. Correlation is significant at the 0.01 level (2-tailed).

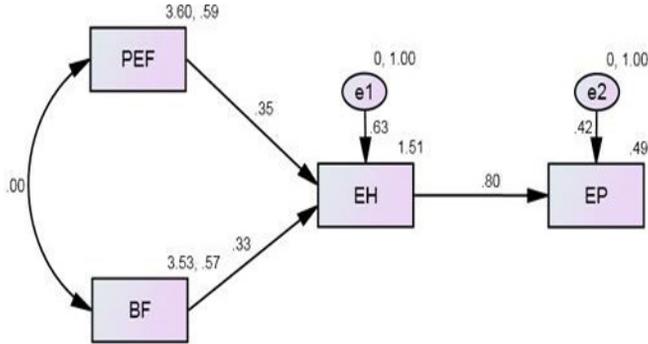


Figure 2. Path analysis of proposed model

*Path Analysis:* As discussed earlier SPSS has been used for fundamental analysis and model has been tested using AMOS-22 and path analysis (SEM) has been applied. Path analysis is a technique used for multivariate analysis for testing the relationship among variables. It is also considered as a part of regression analysis and a part of structural equation modelling. Figure 2 explains the relationship of variables via Path Analysis. In the current model value of chi-square is 10.721 and DF is 6 while probability is 0.097. Value of Chi-square is crucial in the model, and the small value indicates that the proposed model/ theory are correct. The acceptable ratio of fit between chi-square and the degree of freedom is 3:1. In the current model, the minimum value of Chi-square is 4.511 with probability = 0.211 and with degrees of freedom = 3.

*Model Fit Summary.* Summary of model fit is given in Table 4.

Table 4. Model Fit summary

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	11	4.511	3	0.211	1.504
Saturated model	14	0.000	0		
Independence model	8	337.155	6	0.000	56.192

Values of Degree of Freedom 3 and  $p = 0.211$  exhibit that results current model proved the goodness of fit. The current study is a Structural Equation Modeling technique with multivariate data analysis, in this kind of studies if the value of  $p$  is insignificant, it is considered as a good fit, unlike other multivariate techniques. The acceptable range for the value of CMIN/DF is 1 to 3. Results show that the value of CMIN/DF is 1.504, and it lies in an acceptable range and signifies the goodness of fit and CMIN corresponds to chi-square value, which is 4.511.

Table 5. Baseline comparisons

Model	NFI $\Delta$ 11	RFI $\rho$ 1	IFI $\Delta$ 12	TLI $\rho$ 2	CFI
Default model	0.987	0.973	0.995	0.991	0.995
Saturated model	1.000		1.000		1.000
Independence model	0.000	0.000	0.000	0.000	0.000

For checking the goodness of fit, we applied Normed Fit Index (NFI), RFI, Incremental Fit Index (IFI) Tucker-Lewis Fit Index (TLI) and Comparative Fit Index (CFI). It can be observed from Table 5 that the value of Normed fit index (NFI) 0.987 which is greater than the recommended value of 0.9, RFI value is 0.973, and its recommended value is 0.9 (Bentler & Bonett, 1980). Incremental Fit Index (IFI) value is 0.995. According to Bentler and Bonett (1980) cut off criteria for IFI index is 0.95. Tucker Lewis Fit (TLI) Index results show its value is 0.991 according to criteria its value should be closer to 1 for a better-fitted model (Tucker & Lewis, 1973). All the above results are falling in an acceptable range, and it can be concluded that the goodness of fit shows that the proposed model is a good fit. PNFI and PCFI are Proximity Adjusted Measures there is 0.493 and 0.498, and its recommended value is 0.5, actual and recommended values are very close again. Details are given in Table 6.

Table 6. Parsimony-adjusted measures

Model	PRATIO	PNFI	PCFI	RMSEA	LO 90	HI 90	PCLOSE
Default model	0.500	0.493	0.498	0.046	0.000	0.127	0.432
Saturated model	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Independence model	1.000	0.000	0.000	0.484	0.440	0.528	0.000

Root Mean Square Error of Approximation (RMSEA) is another widely used measure of absolute fit. For the goodness of fit, its value lies between 0.03 and 0.08. In the current study RMSEA value is 0.046, given in Table 6 which indicates that the model is a good fit.

Table 7. Regression weights

	Estimate	Standardized Estimate	S.E	C.R	P
EH ← PEF	0.347	0.367	0.053	6.504	***
EH ← BF	0.328	0.341	0.054	6.046	***
EP ← EH	0.796	0.810	0.038	21.230	***

Table 7 shows that value of the coefficient of regression for Physical Environmental Factors (PEF) and Employee Health (EH) is 0.347 at  $p = 0.00$ , and it is considered as significant while Standardized estimate is 0.367. The values show that there is a positive and significant relationship between Physical Environmental Factors (PEF) and Employee Health (EH) Hence,  $H_1$  is accepted. Regression coefficient value between Behavioural Factors (BF) and Employee Health (EH) is 0.328,  $p = 0.000$ , and it is significant. The standardised estimate is 0.341. It means that a positive and significant relationship exists between Physical Environmental Factors (PEF) and Employee Health (EH) and  $H_2$  is accepted. Regression coefficient between Employee Health (EH) and Employee Productivity (EP) is 0.796 at  $p = 0.00$  while the standardised estimate is 0.810 which is also significant and indicates that there is a positive and significant relationship between Employee Health (EH) and Employee Productivity (EP) and  $H_3$  is also accepted. The goodness of fit of has exhibited that Employee Health (EH) play mediating role between Physical Environmental Factors (PEF) and Employees Performance

(EP) and also between Behavioural factors (BF) and Employee Performance (EP) hence,  $H_4$  and  $H_5$  are accepted. Path Analysis findings show that all five hypotheses of the study are accepted.

Table 8. Intercepts: (Default model)

	Estimate	S.E	C.R	P
EH	1.515	0.274	5.526	***
EP	0.485	0.150	6.046	0.001

Intercept or constant value for EH is 1.515, and for EP, it is 0.485 (Table 8). According to Hair et al. (2011), covariance value should be zero between two independent variables. In table number 9 we can see the value of covariance between PEF and BF is 0.000.

Table 9. Total, direct and indirect effects

	BF	Standardized BF	PEF	Standardized PEF	EH	Standardized EH
EH	0.328	0.341	0.347	0.367	0	0
EP	0.261	0.276	0.276	0.297	0.796	
EH	0.328	0.341	0.347	0.367	0	0
EP	0.261	0	0	0	0.796	0.81
EH	0	0	0	0	0	0
EP	0.261	0.276	0.276	0.297	0	0.81

## Discussion

Path analysis results indicated that one unit change in Physical Environmental Factors (PE) generates 35% change in Employee Health. There is a significant positive relationship between PEF and EH, so  $H_1$  is accepted. Path diagram also explains that Behavioural Factors (BF) has a positive influence on Employee Health (EH) and one unit change in BF creates 33% change in EH. There is a positive and significant relationship between BF and EH, and  $H_2$  is accepted. 80% change in Employee Productivity (EP) is caused by a unit change in Employee Health (EH), and we can conclude that employee health is a strong predictor of employee productivity and there a strong and positive relationship between them,  $H_3$  is also accepted. Results have also revealed that there is a mediating role of Employee Health (EH) between PEF and EP as well as between BF and EP.

Productivity is measured in term of absenteeism (Sullivan, Baird, & Donn, 2013) addressing health issues faced by employees helps in determining absentees of employees and health issues of employees directly or indirectly affects absentees rates in employees (Ronald, 2003). Unhealthy working environment and discomfort at the workplace creates health issues in employees, which lead to increased absentees and hence, productivity is decreased (Danielsson & Bodin, 2008). This confirms the study of Peterson and Beard (2004), Ellison Schriefer (2005) who stated that optimum balance is achieved by physical environment by helping

workers in moving from one mode to another. Also, productivity is determined by promoting social and behavioural environmental factors. The results are supported by Haynes (2008b), Peterson and Beard (2004), Haynes (2007). Van der Voordt (2004a, 2004b) stated that Physical Environment helps in creating different work settings which help employees in performing their individual as well as group tasks.

In today's competitive and challenging environment, the physical health of the workforce is vital, and current study has explored the relationship of various environmental and behavioural factors with employee health, which in turns leads organisations towards productivity. Supportive work environment motivates employees (Earle, 2003). Little emphasis has been given to employee health, about productivity, especially on mediating role of for employee health between environmental factors and productivity and findings have shown that the relationship proposed in the model (Figure 1) has been proved. Healthy working environment and managerial support (Bell, 2008; Ramlall, 2003) open communication between employees and supervisors (Earle, 2003) leads to improved performance and helps in retaining employees. Participation of employees in critical decisions, competitive compensation practices, pleasant relations between managers and employees (Gberevbie, 2010) career development and employee empowerment leads to enhanced employee performance (Kundu & Gahlawat, 2016). Results of the study are also consistent with social exchange theory. Social exchange is a process between organisation and employees in which organisation values employee contribution and provide them with the necessary care and makes sure that their well-being level is achieved (Eisenberger et al., 1990).

The current study provides guidelines for practitioners and business managers for finding ways for improving the working environment and helping employees in maintaining good health. HR Practitioners need to put more efforts in providing support to employees and improving managerial behaviour to accomplish employees as well as organisational performance goals (Agarwala, 2003). Study results confirms that PEF, BF and EH are determinants of EP also EH play mediating role between PEF and EP as well as BF and EH. Results of SEM proved the significance of the model and confirmed all the five hypotheses of the study. We can conclude that the model fitted enough and it is imperative for an organisation to consider PEF, BF and EH for improving performance.

## **Conclusions**

Working environment is one of the most important components which influence employee performance within an organizational settings. In today's competitive business environment, monetary benefits alone are not enough for employees in order to achieve higher performance levels. However, a combination of monetary and non-monetary rewards is more effective in achieving higher levels of employee performance, which leads towards achievement of organizational goals. Employees working in software houses need attractive, peaceful and cooperative working environment in order to achieve higher performance level. A happy, industrious employee is vital for IT industry and adequate lighting, noise free and clean office, comfortable seating are the factors of physical environment, considered in current study. Study revealed that, all these factors are vital in affecting employee health. Tea and lunch breaks,

involuntary overtime and friendly working environment were taken as components of behavioral environmental factors. It has been found these factors help in improving employee health and a healthy mind and healthy body leads towards enhanced employee performance. Organisations must maintain a better physical environment in order to enhance employee productivity as employee performance has a direct relationship with workplace environment and employees productivity and physical as well as behavioural environmental are linked through employee health. Improving physical and behavioural factors will improve employee health and healthy employees can be more productive; they can perform their tasks more effectively and efficiently and hence improve employee performance.

### Limitations and future work

Apart from practical and theoretical implications, the current study has many limitations as well and has opened new avenues for further exploration. We used environmental factors to determine employee health; future studies can consider compensation practices, insurance plans and health benefits by the organisation in determining employee health and productivity. Studies can also be performed using a large sample or increasing mediator variables. Different data collection methods can be used in future studies along with a self administrative questionnaire. The current study has been performed in cross-section design while future studies can consider longitudinal studies and a mix of qualitative and quantitative methods can also be used.

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## Appendix

### Survey questionnaire

Dear Sir/Madam, I am a student of PhD management, and this research is a partial requirement of my PhD. Purpose of this research is to investigate about Working Environment and Productivity, through mediating role of Employee Health. Your participation will be highly appreciated and your response will be kept confidential. If you have any questions regarding this research in general or the survey in particular, Please feel free to contact me through email: [hafeeziqra@yahoo.com](mailto:hafeeziqra@yahoo.com).

### Part-I

#### General information

**Gender:** Male  Female

**Age group you fall into?** Under 20  21 – 30 years  31 – 40 years   
41–50 years  50–60 years  60 and Above

**What is your highest education?**

Matriculation  Intermediate  Bachelor  Masters  MPhil

**Work Area?**

Programmer Analyst Graphic Designer System Designer Data Base Administrate

**Work Experience?**

<1 year 1–2 years 2–3 years 3–4 years 5 years and more

What is your brief job description?

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### Part-II

\*Please Tick (√) on any of the response categories mentioned against the following statements showing your degree of agreement or disagreement.

1. Strongly Disagree
2. Disagree
3. Neither Agree nor Disagree
4. Agree
5. Strongly Agree

Sr.	Variables	1	2	3	4	5
1	My furniture is flexible to adjust, rearrange or reorganize my workspace.					
2	My furniture is comfortable enough so that I can work without getting tired during long hours.					
3	I have adequate and comfortable in my office.					
4	My work environment is quiet.					
5	I am able to have quiet and understand time alone.					
6	My workspace has many noise distractions.					
7	My workplace is dusty and not cleared properly.					
8	Sweeper also cleans the office during office hours without disturbing any work of employee.					
9	My workspace is provided with efficient lighting.					
10	Do you control over the lighting on your desk (i.e adjustable desk light on desk)?					
11	Ample amount of Natural light comes into my office.					
12	Number of windows in my work area complete my fresh air and light need.					
13	My office branch is open enough to see my colleagues working.					
14	My work area is sufficiently equipped for my typical needs (normal, storage, movements, etc).					

Sr.	Variables	1	2	3	4	5
15	I am satisfied with the amount of space for storage and displaying important materials.					
16	My workspace serves multi-purpose functions for informal and instant meetings.					
17	My job tends to directly affect my health.					
18	I work under a great deal of tensions.					
19	I have felt fidgety or nervous as a result of my job.					
20	If had a different job, my health would probably improve.					
21	Problems associated with my job have kept me awake at night.					
22	I have felt nervous before attending meetings in the company.					
23	I often take my job home with me in the sense that I think it when doing other things.					

24. Have you experience any sickness during your employment? Yes/No

25. What type of sickness/ health problem you suffer during the employment.

- a. Headache
- b. Back pain
- c. Nerve problem
- d. Eye side problem
- e. Blood pressure
- f. Carpal tunnel syndrome
- g. Other
- h. None of above

26. Would you choose the same profession if a chance is given again? Yes/No

27. Do you think you can enjoy healthy life with this profession? Yes/No

28. Do you live with family during the week? Yes/No

29. How many hours do you spend with your family daily? Yes/No

< hour	1 hour	2 hours	3 hours	4 hours

\*Reserve coding questions.

Once again thank you very much for your valuable time!