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Effects of positive and negative cyberloafing on safety behaviors and occupational incidents during the COVID-19 pandemic: a Bayesian network analysis

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ABSTRACT

Objectives. The purpose of this study is to determine the causal relationships among positive and negative cyberloafing dimensions, safety behaviors and occupational incidents among hospital employees during the COVID-19 pandemic. *Methods*. Data were obtained from 210 healthcare employees working in public hospitals in Turkey. The data were analyzed using Bayesian network analysis. This study examines the factors that have the most significant impact on occupational incidents through Bayesian belief updating. *Results*. The findings demonstrated that 28.7% of the sample experienced occupational incidents. Safety behaviors had the strongest impact on occupational incidents. When recovery (66.2%) and developmental cyberloafing (53.1%) are high, and deviant (64.3%) and addictive cyberloafing (35.6%) are low, the probability of safety behaviors increases (79.6%) and occupational incidents decrease. The development dimension of positive cyberloafing and the deviance dimension of negative cyberloafing had the greatest impact on hospital employees' safety behaviors and occupational incidents. *Conclusions*. Minor/positive cyberloafing behaviors have a high impact on safety behaviors and occupational incidents, whereas major/negative cyberloafing behaviors have a low impact. Therefore, the hospital administration should specifically control deviant and addictive cyberloafing behaviors. Furthermore, the analysis results recommend that managers consider allowing some positive cyberloafing behaviors to reduce occupational incidents.

KEYWORDS

cyberloafing; occupational incident; safety behavior; Bayesian networks; healthcare employees; non-work Internet use

1. Introduction

While there are more than 5 billion Internet users in the world, 59% of them are social media users. The Internet access rate of individuals working full-time for an employer worldwide is 79% [1,2]. Employees spend approximately 10% of their weekly working hours using personal information and communication technologies (ICT) [3]. As the number and duration of users increase, and these technologies are not used for their intended purpose, the financial losses of businesses increase. The cost of personal Internet use to American companies has exceeded USD 85 billion annually [4].

On the contrary, using the Internet for non-work has many positive benefits, such as eliminating unhappiness, generating innovative ideas, refocusing and restoring lost resources [5–7]. For this reason, the benefits and harms of using ICT are entirely shaped by the time and purpose of its utilization [4,8]. As Internet access and other ICT levels increase, it is impossible for employees to isolate themselves from these technologies, even at work [9]. For this reason, cyberloafing is a phenomenon that the modern business world will constantly encounter. Cyberloafing is defined as the use of ICT for personal purposes during working hours [10]. These uses have increased, especially with the development of technologies such as smartphones, tablets, lightweight computers and electronic book readers. In this process, many resource providers moved their services online, further increasing the usage time. Cyberloafing behaviors are typically discussed in the literature in relation to productivity losses [11]. On the other hand, these behaviors also have positive effects such as alleviating work stress, reducing burnout, coping with workload, learning new and fresh ideas, fueling creativity, replenishing energy, juggling work–family responsibilities, increasing job satisfaction, proactive behavior and work performance [12–15]. Therefore, these behaviors have both negative and positive aspects [16]. Addressing these behaviors simultaneously will enable a better understanding of the misuse of digital technologies in the workplace and contribute to generating effective strategies to manage these behaviors.

ICT are now integral to everyday life and the workplace [17]. For this reason, although using these technologies during work hours may lead to a loss of productivity, their relaxing effect on employees should not be ignored [18]. The factor that clarifies this blur is the time spent engaged in these behaviors and the purpose for which they are used. Short-term browsing, known as a microbreak, can contribute to personal development, enhance the employees' productivity over time and relax their minds, like taking a coffee break or making a cup of tea. Cyberloafing through microbreaks has a calming effect on employees, keeping them more engaged, relieving stress and making work more enjoyable [19].

On the other hand, long-term use of ICT can lead to productivity losses by increasing employee distractions [17,20–22]. The negative effects of addictive and deviant cyberloafing behaviors on employees also impact their safety behaviors in the workplace [23]. In the long run, these time-consuming behaviors will not contribute to business goals, threaten workplace safety and invite occupational incidents. On the other hand, the development and recovery dimensions of cyberloafing behaviors contribute to employees' short-term mental relaxation, akin to a coffee break, and their ability to refocus

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on work after a brief pause. These behaviors help employees relax their minds for a short time, reduce their stress and then refocus on their work [8,24].

Considering the positive and negative aspects of cyberloafing already mentioned, the effects of cyberloafing on occupational incidents can be explained by combining the perspectives of the effort-recovery model (ERM) [25] and ego-depletion theory (EDT) [26]. The ERM explains the process of individual source recovery, while the EDT elucidates the process of individual source depletion [27]. While individuals make various choices based on their will, they always strive to integrate into the external world through their ego, which acts as a mediator between their id and their superego [26]. In this adaptation process, individuals experience a temporary decrease in their energy, capacity and resources due to previous exercise of volition [26,28]. From the EDM perspective, deviant and addictive cyberloafing behaviors deplete individuals' mental and emotional resources [29]. These behaviors refer to prolonged and unrelated use of ICT use that harms employee productivity over time. For example, major cyberloafing activities such as playing online games, chatting or gambling on betting sites are among these behaviors [30]. Hence, engaging in negative cyberloafing behaviors results in avoiding work tasks or the compulsive use of ICT [31]. As these behaviors consume employees' time and create distractions, they threaten workplace safety [20,21,32,33]. Therefore, when these behaviors are not controlled by managers and organizations, and necessary precautions are not taken, they can lead to consequences that threaten safety. As a result, it is quite possible to have occupational incidents due to the deterioration of workplace safety.

To cope with the workload created by work-related demands, individuals exert effort and consume significant mental and physical resources. On the other hand, these resource depletions also lead to a sense of need for recovery [25,34]. Therefore, taking small breaks when necessary also makes it easier to meet future business demands [35]. From the ERM perspective, the development and recovery dimensions of cyberloafing behaviors lead to relatively short breaks from work and provide psychological detachment [5]. These behaviors, which act as a resource replenishment mechanism, contribute to employees' mental and physical health [17,27]. Recovery and developmental cyberloafing for rest and mental relaxation do not harm productivity; they even boost it [19]. They enhance individuals' learning abilities and provide employees with a way to recovery from their work activities, ultimately leading to a positive impact on employee productivity over time [16,31]. For example, these behaviors include minor online activities such as visiting websites for personal development, browsing daily news headlines and reading work-related blogs [30]. They may seem negative because they are not directly related to the job, but their drawbacks are only at the micro level, while their benefits can potentially be at the macro level [19,27]. In addition, when considering the positive and powerful effects of these behaviors on employees' mental health and psychological well-being, these negative effects are further diminished [5,11]. These microbreaks interrupt the monotony of work and assist employees in developing different perspectives on their tasks. Positive cyberloafing behaviors are a strategy to alleviate the tension caused by a stressful work environment [24,36]. As a result, these behaviors also have positive impact on safety practices in the workplace, thereby decreasing the chances of occupational incidents and injuries [8,37].

The COVID-19 pandemic has placed workers under an overwhelming workload and necessitated reduced face-to-face contact. In this process, healthcare employees have been the most affected professionals [38]. During the pandemic, healthcare professionals have minimized communication with their families and have increasingly relied on ICT technologies, particularly mobile devices. Engaging in activities like taking a coffee break or participating in non-work conversations, digital technologies enable employees to relax their minds, alleviate work stress, combat emotional exhaustion, prevent unhappiness and replenish their depleted resources [19,39,40]. However, the utilization of these technologies, which have positive impact on mental health by promoting psychological detachment, must be kept within certain boundaries [5]. The excessive usage of these technologies may pose a threat to workplace safety by encouraging work avoidance, fostering addiction and potentially leading to occupational incidents.

The aim of this research is to investigate the impacts of positive and negative cyberloafing behaviors on safety behaviors and occupational incidents. Considering that studies in the literature often focus on the negative aspects of cyberloafing, research simultaneously exploring both the positive and negative sides is quite limited [18,27]. At the same time, given the limitations of linear methods (such as regression analysis or structural equation modeling) [41,42], this study's contribution is to examine them using Bayesian network (BN) analysis, a non-linear method. In addition, as suggested in previous studies [43], the COVID-19 pandemic is a unique situation that results in an overwhelming workload and has negative effects on employees' psychology, jeopardizing their workplace safety and potentially leading to occupational incidents. Therefore, determining the factors that affect occupational incidents under the influence of this process and developing policies to manage them are important for adapting to similar situational factors in the future.

2. Materials and methods

2.1. Sample and procedure

According to the International Labour Organization (ILO) statistics for 2024 [44], Turkey ranks 11th in the world in terms of non-fatal occupational injuries (2459 per 100,000 people). Therefore, this study was conducted on a sample of the Turkish population, which has a high incidence of occupational injuries.

After determining the scales to be used in the study, ethical approval was obtained from the university's ethics committee to which the corresponding author was affiliated. Conducting a face-to-face survey was very challenging due to the heavy workload on hospital staff and the risk of infection, especially during the COVID-19 pandemic. For this reason, hospital employees who were aware of scheduled breaks and availability were needed to conduct the surveys. The study's aim and the questionnaire statements were explained to these employees in detail. After agreeing on all the questions, an online survey link was sent to the volunteer participants by nurses and technicians who had personal contacts. Surveys were sent online by the employees to the relevant staff.

In the selection of participants, preference was given to employees who had a conducive work environment for cyberloafing and who frequently utilized ICT. For this purpose, a control question was added to the survey to determine whether employees use ICT intensively during work hours. Employees who answered 'no' to this question were not included in the sample. Employees' intense use of the Internet, computers, smartphones and other technologies makes them inclined to use these devices for personal purposes. As a result, considering the possibility of outliers, the target was set to reach 400 people. However, this criterion significantly limited the sample size, which did not meet the desired level. On the other hand, the COVID-19 pandemic has been one of the main limitations that prevented a large sample size from being achieved.

For 14 weeks, 210 employees who met this criterion agreed to participate in the study, representing a 54.7% response rate. Upon finalizing the data collection process to test for non-response bias [45], the data of early responders (54.7%) and late responders (45.3%) were compared. Accordingly, a significant difference in the means of all variables was not found ($p > 0.05$). Due to the utilization of the Bayesian method instead of classical test theory, the methodology is not influenced by sample size. This study's confirmatory factor analysis (CFA) yielded a root mean square error of approximation (rmsea) value of < 0.08, indicating an acceptable fit index for the sample size [46]. Based on these arguments, it is asserted that the results are robust. The majority of the respondents were female (76.7%), married (61.9%) and in the age group 31–40 years (42.4%). In the sample, 64.8% of participants were nurses, 15.2% were technicians, 12.4% were physicians and 7.6% were other healthcare staff.

2.2. Measures

Cyberloafing behaviors were assessed using van Doorn's [31] four-dimensional, 12-item cyberloafing measure. The measure was adapted to Turkish by Ozkalp and Yildiz [18]. Because the scale measures both positive and negative cyberloafing behaviors simultaneously, this cyberloafing scale was preferred in the study. The scale consists of four dimensions: development, recovery, addiction and deviance. The first two dimensions reflect positive cyberloafing behaviors, and the latter two reflect negative cyberloafing behaviors. Respondents indicated their agreement with each item using a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*).

Safety behavior was assessed using a six-item measure developed by Neal and Griffin [47]. The scale includes statements that reflect the main activities necessary to ensure workplace safety and the indirect behaviors that support these activities. The measure was adapted to Turkish by researchers using Brislin's [48] back-translation method. Lastly, a few adjustments and modifications were made to fit the Turkish context. Participants were asked to express their opinions on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*).

The respondents were asked to indicate whether they had experienced an occupational incident during the COVID-19 pandemic (1 = *yes*, 2 = *no*).

The overall CFA demonstrated that the measurement model had an acceptable fit ($\chi^2 / df = 2.28$, comparative fit index [CFI] = 0.93, Tucker–Lewis index [TLI] = 0.91, incremental fit index [IFI] = 0.93, standardized root mean square residual [SRMR] = 0.07, rmsea = 0.08) to the data [46]. Cronbach α coefficients of the subdimensions of cyberloafing were 0.87 for development, 0.89 for recovery, 0.83 for deviance and 0.82 for addiction. The reliability coefficient of safety behaviors was determined to be $\alpha = 0.86$. Composite reliability (CR) values were 0.76, 0.79, 0.73, 0.74 and 0.87, respectively. Average variance extracted (AVE) values were 0.69, 0.75, 0.63, 0.66 and 0.54, respectively. All AVE estimates for convergent validity were greater than the standard threshold of 0.50. According to the Fornell–Larcker (F-L) criterion [49], which is the square root of the AVE, each construct should be higher than its correlations with the other constructs [50]. The F-L criterion was met for all dimensions, and the present results satisfied the discriminant validity. For reliability, Cronbach's α and CR estimates were above the standard minimum required level of 0.70 [51].

2.3. Data preprocessing

In Bayesian analysis, all continuous variables in our model were transformed into categorical variables because the variables should be nominal or ordinal. Since the mean of each variable varies between 1 and 5, this range was divided into three equal parts: low, medium and high states. These states were identified for each variable based on these criteria. The expectation-maximization algorithm was utilized for training the model [52], which can also handle missing datasets. The BN diagram was created using Netica version 6.07.

2.4. Bayesian network analysis

A BN model was constructed following reliability and validity analyses. The network consists of qualitative and quantitative parts [41]. The quantitative aspect is depicted in the directed acyclic graph, illustrating the probabilistic relationships among variables, while the qualitative aspect comprises a set of nodes symbolizing the variables. In particular, the qualitative part is important because it specifies the final relationships among all variables through conditional probability tables [53]. One of the most important features of a BN is its belief-updating feature, which demonstrates the effects of certain variables on other target variables [54]. Bayesian belief updating involves transforming prior beliefs into posterior beliefs, thereby indicating conditional probabilities for the states [55]. This feature is unique as it provides researchers with probabilities about various conditions based on the Bayesian theorem [56]. In this study, the impact of each cyberloafing factor on reducing the likelihood of occupational incidents has been uncovered through this characteristic.

3. Results

3.1. Bayesian networks

BNs are primarily used to calculate the conditional probabilities of an output variable in the network model [57]. The BN model constructed to analyze occupational incidents is illustrated in Figure 1. The marginal probabilities for research variables in Figure 1 clarify the current conditions in public hospitals. According to the BN, 28.7% of health employees experienced at least one occupational incident in the last 12 months during the COVID-19 pandemic, and 76.1% stated that the level of safety behaviors in their hospitals was high. Furthermore, 65.9% of employees engaged in developmental cyberloafing and 51.9% reported engaging in high-level recovery cyberloafing. On the other hand, 63.5% of participants

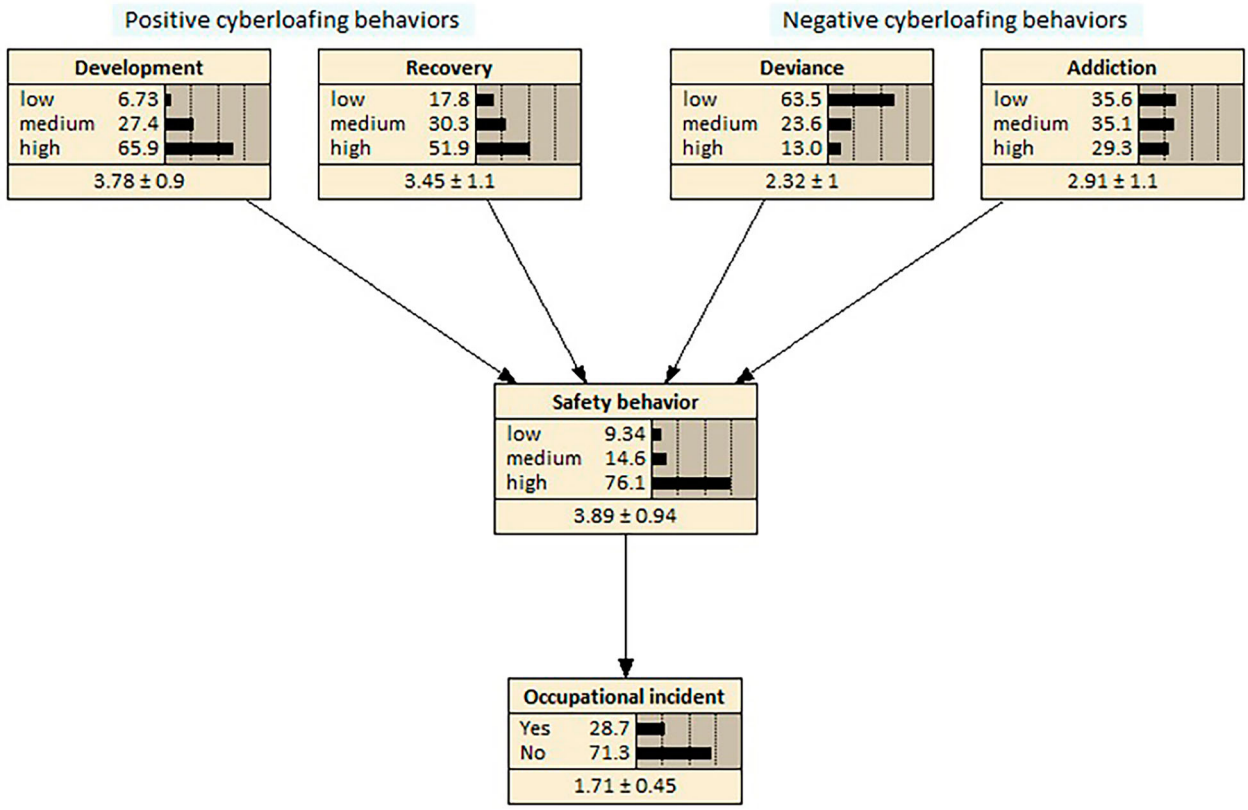


Figure 1. Bayesian network model for analyzing and predicting occupational incidents after training the model.
Note: Last row of each node indicates the mean ± standard deviation.

expressed low-level deviant cyberloafing and 35.6% reported low-level addictive cyberloafing behaviors.

The sensitivity of occupational incidents to cyberloafing and safety behaviors was evaluated using Equation (1) and belief updating, as detailed and suggested by previous research [43,53,58]:

$$\Delta p = \left(\frac{p(\text{occupational incidents} = \text{no} | \text{variable} = \text{'a state'}) - p(\text{occupational incidents} = \text{no})}{p(\text{occupational incidents} = \text{no})} \right) \text{x } 100, \quad (1)$$

where Δp = relative probability changes of 'occupational incidents = no'; p(occupational incidents = no | variable = 'a state') represents the probability of no occupational incidents given that other variables are in their low, medium and high states; p(occupational incidents = no) denotes the marginal probability of no occupational incidents. For detailed information about this equation, refer to the studies by Mohammadfam et al. [53] and Aliabadi et al. [58].

The absolute mean scores of variables were used to evaluate the sensitivity and ranking of variables influencing occupational incidents (see Table 1 and Figure 2). These values were used to create an index and are presented in Table 1. According to Table 1, among the variables directly impacting occupational incidents, safety behaviors (with an absolute mean of 16.563) had the greatest impact on occupational incidents. Furthermore, among the positive and negative cyberloafing behaviors, recovery cyberloafing (with an absolute mean of 2.630), developmental cyberloafing (with an absolute mean of 2.062), deviant cyberloafing (with an absolute mean of 0.763) and addictive cyberloafing (with an absolute mean of 0.282) were the dimensions that have impacts on occupational incidents, respectively. After safety behaviors, the most effective dimensions of cyberloafing are recovery and development.

In addition, the belief updating technique was utilized to assess the extent of the impacts of positive and negative cyberloafing factors on safety behaviors (see Table 2 and Figure 3). Table 2 presents the results of the sensitivity analysis of various forms of cyberloafing. According to Table 2, among the factors directly impacting safety behaviors, recovery cyberloafing (with an absolute mean of 18.222) had the most significant impact on safety behaviors. This rank was followed by the deviance dimension of negative cyberloafing (with an absolute mean of 15.637) and the development dimension of negative cyberloafing (with an absolute mean of 15.112), respectively. The addiction dimension of negative cyberloafing (with an absolute mean of 0.394), had the least impact on safety behaviors.

4. Discussion

The purpose of this study was to determine the causal relationships between positive and negative cyberloafing dimensions, safety behaviors and occupational incidents in hospitals. A BN was used to identify the most important components of cyberloafing and safety behaviors that influence occupational incidents.

According to this study, safety behaviors are the most important and direct determinant of occupational incidents. On the other hand, the effects of cyberloafing are not immediately apparent but they manifest their impact on occupational incidents through safety behaviors. Employees and hospital

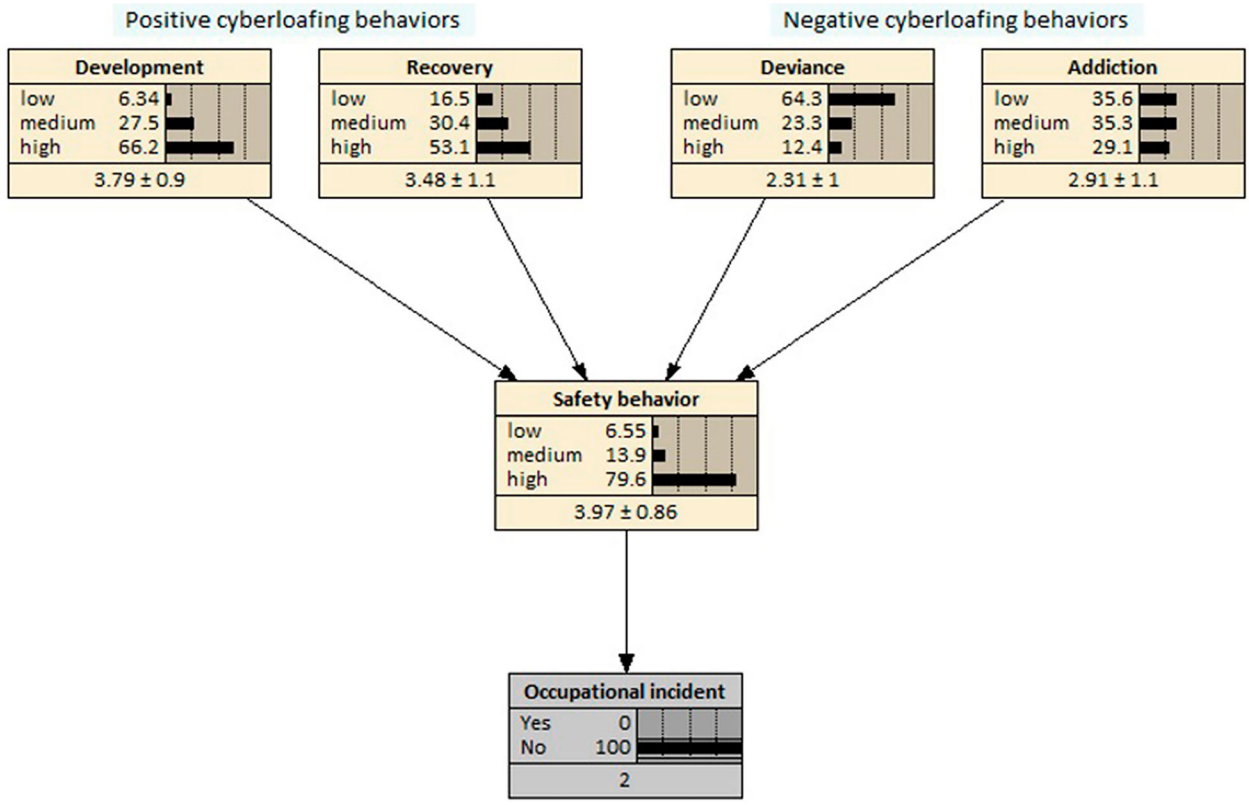


Figure 2. Probabilities of reducing occupational incidents.
Note: Last row of each node indicates the mean ± standard deviation.

Table 1. Relative variation in the probability of < 'occupational incidents' = no > corresponding to other variable states.

	State (%)				
Variable	Low	Medium	High	Absolute mean	Rank
Safety behaviors	−29.775	−4.494	−15.420	16.563	1
Recovery cyberloafing	−7.163	0.702	0.024	2.630	2
Developmental cyberloafing	−5.618	0.562	0.007	2.062	3
Deviant cyberloafing	1.404	−0.843	−0.041	0.763	4
Addictive cyberloafing	0.281	0.562	−0.004	0.282	5

Note: Number of participants in subsample = 210.

administrators may not readily discern the impact of positive and negative cyberloafing factors on occupational incidents. Therefore, their effects occur more indirectly. Since this indirect effect has been discussed in some studies [43,59], it is also the main reason for using the BN model in this research.

The research conducted by Ghasemi et al. [43] revealed that safety performance had the most significant impact on occupational incidents. Safety behaviors that demonstrate employees' compliance and participation in safety-related practices are the primary factors in preventing occupational incidents. Although the necessary training and safety awareness are established, it is a fact that these behaviors can be violated due to various preferences and behaviors over time.

Analysis using a BN revealed that security behaviors were most affected by recovery and deviant cyberloafing. These results are consistent with the studies by Wu et al. [27], Ozkalp and Yildiz [18], Keklik et al. [16] and van Doorn [31], which simultaneously examined positive and negative cyberloafing dimensions. These results are also consistent with the ERM and EDT [25,26].

Cyberloafing behaviors have two aspects: they either contribute to individual development and renewal, or they undermine productivity. However, managers tend to focus more on the negative aspects and perceive them as risky behaviors [60]. Especially given the rapid development of ICT technologies, hospitals and other organizations sometimes take very restrictive measures to prevent the waste of time that these behaviors can cause [61]. Although these prevention mechanisms usually target negative cyberloafing behaviors that are costly and cause productivity losses, they overshadow the positive aspects of these behaviors for employees [16]. Practitioners and scholars have recently examined the positive aspects of these behaviors [17].

Recovery and developmental cyberloafing are short-lived behaviors with a low potential for distraction. They do not reach the level of addiction or deviance if they are kept in check and may even contribute to employees' productivity [11]. Microbreaking by watching a video on professional topics invigorates employees, activates positive feelings and fosters understanding [19]. With the proliferation of smartphones, tablets, desktop PCs and lightweight laptops, these technologies have become indispensable elements of daily life. In particular, due to the proliferation of online social media platforms in recent years, levels of ICT usage are on the rise. It has now

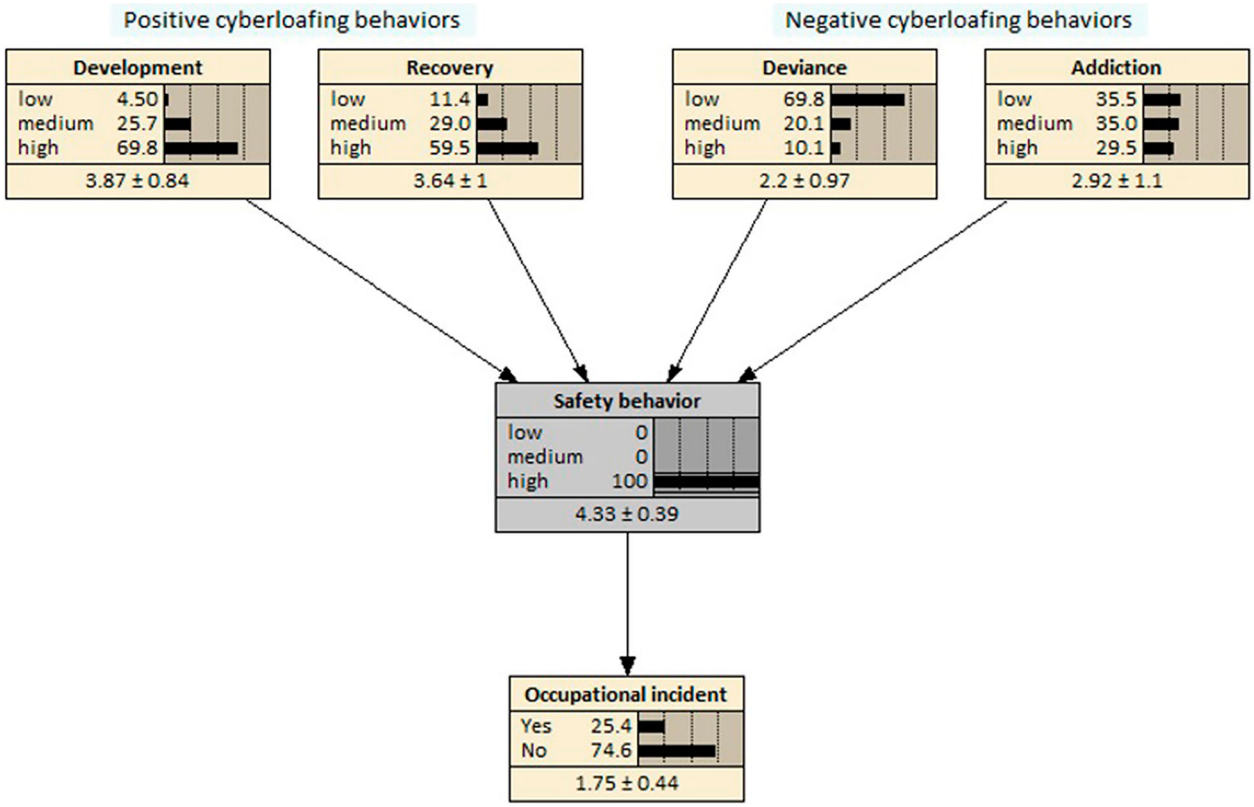


Figure 3. Probabilities of promoting safety behaviors.
Note: Last row of each node indicates the mean ± standard deviation.

Table 2. Relative variation in the probability of < 'safety behaviors' = high > corresponding to other variable states.

	State (%)				
Variable	Low	Medium	High	Absolute mean	Rank
Recovery cyberloafing	−35.874	−4.074	14.717	18.222	1
Deviant cyberloafing	9.987	−14.586	−22.339	15.637	2
Developmental cyberloafing	−33.114	−6.176	6.045	15.112	3
Addictive cyberloafing	−0.394	−0.131	0.657	0.394	4

Note: Number of participants in subsample = 210.

become almost impossible to completely disconnect employees from the online social world, even during working hours [62]. In a study conducted by Lim and Chen [7], 97% of men and 85% of women stated that they see cyberloafing as acceptable behavior in the workplace. This research revealed that Internet browsing activities have a positive impact on employees. Similarly, Robertson and Kee [6] found that cyberloafing is positively associated with employee job satisfaction. Therefore, instead of restricting these behaviors, which have the potential to alleviate the destructive effects of a stressful work environment, it is better to view them as activities that relax the mind, relieve distractions and contribute to well-being [24]. It is a wise strategy to prevent these behaviors, which have the potential to yield minor and positive outcomes, from escalating into counterproductive behaviors through effective time management practices. Thanks to recovery and developmental cyberloafing, distractions and mental fatigue are overcome, and safety behavior is encouraged, which helps prevent occupational accidents [37].

According to the present study findings, engaging in deviant cyberloafing significantly impacts employees' safety behaviors, consequently increasing the likelihood of occupational incidents. Deviant cyberloafing leads to the avoidance of job responsibilities, slacking, shirking and procrastination [8,20,63]. At the same time, such cyberloafing behaviors increase the mental fatigue and work stress of the employees, negatively affecting their mental health [18,27] and consequently make them more prone to incidents. In this study, the impact of addictive cyberloafing on safety behaviors and occupational incidents was found to be compared to other factors. This result does not mean that these behaviors should be taken lightly. Addictive cyberloafing is a behavior that develops due to excessive use of ICT beyond the conscious use of the employees, leading them to use ICT unconsciously [31]. In this study, the minimal impact of these behaviors on occupational incidents may be associated with the conditions of the work environment. Hospitals are workplaces with a high workload, and at the same time, patient care and treatment should be continuously prioritized. Since the continuation of addictions in this environment has irreparable effects on patients' lives, involvement in these activities in the workplace should be very limited. Otherwise, when employees have the opportunity to escape from their heavy workload, they may engage in deviant and addictive cyberloafing activities that do not benefit them.

In summary, negative cyberloafing behaviors (such as addictive and deviant cyberloafing) can elevate cognitive

arousal, deplete energy and potentially lead to increased burnout [29]. These behaviors deplete individuals' mental and emotional resources, lead to avoidance of work activities and drive them to engage in ICT activities compulsively and uncontrollably [31]. As a result, resource depletion negatively affects the ability to engage in core safety activities and makes people reluctant to engage in voluntary safety activities. Therefore, especially those who have direct communication with patients (e.g., doctors and nurses) should stay away from such deviant and addictive cyberloafing [63]. Patient care requires zero errors, and timing is critical in this work environment. A careless diagnosis, treatment decision or delayed treatment can lead to the loss of a patient's life. For this reason, these behaviors that constitute the counterproductive aspect of cyberloafing should be proactively controlled through self-control and training activities [22,64]. Otherwise, these behaviors will negatively affect safety practices and make workplace incidents inevitable [23,65].

Considering that the research data were collected during the COVID-19 pandemic, while the policies regarding the use of ICT under normal conditions were more restrictive [33], expectations regarding the use of non-work ICT have become more flexible in this period. Many health workers may have also resorted to deviant cyberloafing as a coping mechanism to overcome burnout and stress induced by their workload during this period [38,66]. As is known, the COVID-19 pandemic was a very challenging period for healthcare personnel, and many healthcare workers lost their lives during this time. Managers who observed the negative effects of the pandemic on the psychology of healthcare workers were more receptive to the use of personal ICT. In addition, employees have experienced that using ICT for positive purposes and not for extended periods does not cause much harm and can even be beneficial [8,24]. The experience of ICT as a part of business and daily life has changed managers' perspectives. As a result, considering the contribution of cyberloafing, which is done for personal development and refreshment both in this process and at other times, to the refreshment and development of individuals, positive cyberloafing can be evaluated as 'cyberrefresh', 'cyberrecovery' or 'cyberdetachment'. Studies also support the positive aspects of these microbreaks [5]. These short breaks help employees recharge their energy, generate innovative ideas and refocus by replenishing depleted resources. At the same time, they increase attention and make employees feel more energetic. However, as already mentioned, it is also a fact that these behaviors can lead to addiction and undermine productivity when they are not kept within certain time and behavior limits.

4.1. Implications for healthcare providers and health policy

Cyberloafing emerges as a significant issue, particularly for employees who struggle to maintain a healthy balance between their online activities and work responsibilities and exhibit low self-control. Based on the results of this research, various intervention strategies can be developed. These strategies can help mitigate the impact of cyberloafing behaviors on healthcare professionals. By doing so, employees can concentrate on patient care activities, utilize working hours more efficiently and transform cyberloafing behaviors into organizational advantages. First, rules should be established to ensure the appropriate use of ICT without a restrictive approach. These rules should be communicated to employees through in-service training activities. Later, these usage policies should be incorporated into the employee code of conduct. The primary criterion for developing codes of conduct should be to regulate non-work ICT usage in a way that supports healthcare activities. Employees should be informed that short breaks during in-service training are administratively supported. However, these uses should be in the form of microbreaks at noon or outside care and treatment hours for recovery and developmental purposes. Plus, regular training should be organized on smartphones, social media applications and ICT-induced addictive and deviant behaviors. Second, informative posters highlighting cyberloafing and its impact on patient safety should be displayed in prominent areas of the hospital or on bulletin boards to raise awareness. Third, media literacy-related courses or training should be included in employee orientation programs and undergraduate education curricula. Within the scope of that training, information about cyberloafing and other technology and social media addictions should be provided. Fourth, the motivations of health professionals to use these practices should be determined through various field studies, and suggestions should be developed for the identified factors [67]. Previous studies have revealed that employees exhibit cyberloafing as a coping mechanism in response to mistreatment, injustice, bullying or job stress [22,24]. However, identifying the positive workplace outcomes of cyberloafing can shift the negative perception of these behaviors. As the sociological and psychological aspects of these behaviors are understood, more permanent solutions can be created for the health sector. Finally, individuals in managerial positions should play an important role in developing workplace social relations. As social relations develop, employees will no longer need to engage in counterproductive cyberloafing behaviors in the long term.

4.2. Limitations

Like other studies, the present study has some limitations. First, the research data were collected using a self-reported and cross-sectional research design. This situation limits the generalizability of the research results. Although the COVID-19 pandemic is the primary factor influencing this choice, this limitation can be addressed through longitudinal studies. Second, the data for the current study were collected from hospital staff using personal networks. However, the sample size could not reach the desired extent due to the COVID-19 pandemic. Therefore, the results of this study should be retested with larger sample sizes. Third, since this study was conducted in the health sector, future studies should be conducted in different sectors, and the results should be compared with those of this research. Fourth, considering the positive impact of cyberloafing behaviors on productivity and health, there is still a need to reach a consensus on the appropriate limits for such usage [9]. These usage limits may also vary according to the workload and sector [4]. Therefore, future studies should be conducted in various sectors and compared with the findings of this study.

Moreover, since the workload during the COVID-19 pandemic differs significantly from that in other periods, the research findings need to be re-evaluated at different points in time. During the pandemic, overwork has become necessary and even obligatory. Employees have been compelled

to work beyond their formal job descriptions, which are not always within their control [68]. Apart from cyberloafing, various factors such as compulsory citizenship behaviors and work overload may also have influenced safety behaviors and occupational incidents. Future studies should focus on identifying these factors. Plus, studies that focus on subtypes of cyberloafing behaviors, such as social cyberloafing [11,27], may help in obtaining more specific information about these behaviors in the future.

5. Conclusion

It is a fact that employees engage in cyberloafing to cope with the psychological pressure induced by the COVID-19 pandemic. In this process, especially to keep up with the developments in the country and the world, employees are using ICT for personal purposes more than ever before. It is essential that this increased use remains within certain limits and does not harm the employees' productivity. Developmental and recovery cyberloafing, which involve engaging in positive or minor cyberloafing activities (such as briefly checking the daily news or listening to music in the background), are behaviors that can enhance the mental and physical well-being of employees. Although minor cyberloafing can have positive outcomes, it is crucial to utilize ICT during scheduled breaks rather than during peak hours. It is also important to disable notifications that could divert attention, particularly when attending to patients. By doing so, these behaviors can be prevented from escalating into significant, severe or detrimental cyberloafing. If these behaviors escalate into addictive and deviant cyberloafing, productivity losses will directly increase. Negative cyberloafing behaviors, such as online betting and chatting on social media platforms, decrease productivity and create distractions [33]. These serious cyberloafing behaviors can reduce safety measures and consequently increase occupational incidents. As a result, it is more appropriate to allow the use of ICT within certain limits than to take a prohibitive approach when determining workplace policies regarding employee productivity. Particularly, limiting the use of technology and the Internet to 30 min for salaried employees is likely to enhance productivity and have a positive impact on employees' mental health [8]. In addition to the fact that these uses are short-term, it is equally important that they are customized according to the needs of the employees [19]. Since each employee's workload and mental fatigue vary, it is advisable to encourage the use of microbreaks according to the individual needs of employees [5,37].

Disclosure statement

No potential conflict of interest was reported by the authors.

Ethical approval

The ethical approval for this research was obtained from the Committee on Ethics in Research on Humans of Bandirma Onyedi Eylul University (approval number: 2021-05).

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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