Work-Related Information & Communication Technology Use and Occupational Burnout: The Mediating Role of Recovery Experiences

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Abstract

Technology has changed the relationship between work and life and allowed work to engage in our home lives. It is no longer the case that when the working day is over people switch off, rather it is when people go home and remain connected. In a culture where people are always connected via information and communication technology (ICT) the line between work and life has blurred. The present study investigated the relationship between ICT and occupational burnout with the mediating role of recovery experiences and their importance in the relationship. The study was conducted in Southern Sweden in Växjö. The study included 101 participants both male (N=53) and female (N=48) from public and private sectors where participants used ICT on a regular basis to perform job-related tasks. Data was collected using a self-reported web-based questionnaire. Results of the study revealed that there is no significant correlation between ICT and occupational burnout. However, it was found that there is a significant negative correlation between ICT and recovery experiences and a strong significant negative correlation between and recovery experiences and occupational burnout. It was concluded that occupational burnout results from insufficient recovery from work-related stressors and not the stress itself.

Keywords: work-related ICT, occupational burnout, recovery experiences, employee psychological well-being
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Modern technologies are evolving and changing the way employees work and how work is done in organizations according to Cascio and Montealegr (2016). When the working day is over, employees leave their workplaces and carry with them modern technologies such as smartphone and laptop. Technically, keeping these devices switched on when they return home this means they are still connected virtually with their working environment since employees can receive and respond to notifications, updates, e-mails, phone-calls, etc. According to Hakanen and Baker (2017), employees are incapable of getting away from work-stress and enjoy complete recovery from work. This phenomenon sets employees on the traditional risk of emotional and cognitive overload that might result in burnout syndrome. They also argued that the phenomenon of being always connected to work by information and communication technology (ICT) has increased in recent years along with a high level of exposure to information from work and during leisure time. In turn, this result in emotional demands and workload may be followed by burnout due to high levels of cognitive overload. According to Hakanen and Baker (2017), exposure to high levels of cognitive demands means no full recovery during free time.

According to Derks and Bakker (2014), the phenomenon of always being on for work-related tasks during non-working hours via ICT and inability to receive full recovery from work during leisure time yet is questioned and the impact of modern technologies on employees’ recovery and escalation of burnout symptoms yet are underexplored. Fritz and Sonnetag (2008) argued that in recent years, several studies has been conducted on recovery to explore the benefits of weekend and holiday for employees. However, they argued that those studies should consider the daily recovery during the evening hours when employees return from work since it is essential for employees’ health, well-being, and performance. Evening hours help employees detach from work to recover appropriately from stress (as cited in Derks & Bakker, 2014).

This study’s primary aim was to investigate if employees using work-related ICT during non-working hours are prone to occupational burnout and if recovery experiences mediate the relationship between them. Hence, the correlation between work-related ICT use during non-working hours and occupational burnout was investigated with attention to recovery experiences as the mediator variable in the relationship. Additionally, the study aims to shed lights on employees’ well-being and psychological health, and its growing risk factors
beyond the workplace and office hours from a new angle in the work context and changing work life. According to Bakker (2017), burnout is a very common subject for investigation in traditional work settings and traditional jobs. However, traditional jobs are undergoing a revolution of changes since workers in modern time achieve more with fewer resources, which emphasizes the need to understand the changing nature of work.

Literature review

Remaining always connected to work via ICT during non-working hours leaves employees' health conditions uncertain. A research study carried out by the U.S Department of Labor in 2004 revealed that 10.3 million Americans have worked seven hours of work-related tasks per week from home according to Fenner and Renn (2010). According to Madden & Jones (2008), a study on 1000 employed American adults exposed that 62 percent of workers are ‘network workers’ since they are always connected online via ICT. In addition, 45 percent of the workers reported that they worked from home using ICT during night times and weekends. As a result, 49 percent of the workers reported that the use of ICT during non-working hours increased their stress level, and they are no more able to separate themselves from work responsibilities while at home and on weekends (as cited in Fenner & Renn, 2010, p.64).

Work-related stress was defined as a situation that causes physical, psychological or social problems according to Chirico (2016). Lee, Change, Lin and Cheng (2014), argued that constantly staying available creates employees a major source of stress because of the accessibility and flexibility that ICT creates and promotes alongside compulsive checking of missed calls, text messages, or emails (as cited in Ninaus et al., 2015). Further, Mazmanian et al., (2011), argued that work-related ICT create expectations for quicker responses and fosters an always-on tendency (as cited in Ninaus et al., 2015). The psycho-social risks and work-related stress are increasing over time and challenging the occupational health and safety field. The challenges are believed to impact employees, organizations, businesses, and national economies negatively. According to Cox, Griffiths and Gonzalez (2000) work-related stress causes work-related health problems, such as heart diseases, gastrointestinal problems, anxiety, work-family conflict and burnout syndrome (as cited in Chirico, 2016).

From another perspective, the internet access remains people always connected anywhere, anytime, more than ever before. This modern phenomenon is believed to positively affect the individuals’ social and private lives by taking advantage of ICT, to accomplish their
job tasks quickly and dynamically. Companies are making initiatives to pay for the work conducted at home or any other workspace used by employees in recent years (Leung, 2011). Employees do not necessarily need to be in the workplace to accomplish their job tasks anymore due to the modern culture and flexible work structure created by ICT. Mankin, Cohen, and Bikson argued that “offices and workspaces can be characterized by where workers actually generate, process and communicate information, whether at home or at work, rather than by the location of the building” (as cited in Leung, 2011, p. 251). According to Hill et al. and Valcour and Hunter, this phenomenon goes in line with what researchers have found that using ICT help individuals organize their work tasks and simultaneously organize their family affairs. Consequently, this reduces the tension between work and family over employees (as cited in Leung, 2011).

The purpose of this review was to present the reader with the positive sides of ICT use and connectedness phenomena in relation to the occupational context, and how modern technologies carried flexibility and autonomy to employees when performing work-related tasks. However, the negative sides of this phenomena concerning well-being and psychological health remains an open discussion for research due to the lack of research conducted regarding this matter as few researchers argued according to Ninaus et al. (2015). The following parts of the paper will provide the reader with definitions and detailed description of the variables according to previous scientific studies and research reviews, and their connection with recovery experiences. The negative effects sides of work-related ICT beyond working hours are discussed and explored, and how they contribute to the escalation of occupational burnout.

**Information and communication technology (ICT)**

In the current study the definition of Information and communication technology refers to technology devices or tools that are applied to gather, share and distribute knowledge, and interact by use of computer and networks including collaboration software and social media (Antonelli, as cited in Gressgard et al., 2014). According to Gressgard (2011), the use of ICT encourages the access to internal and external knowledge and facilitates the information and shares relevant knowledge to organizational members. According to Rakow and Navarro (1993), ICT connects work with home and home with work. The use of smartphones for example allows parents to stay available for their homes and children from their workplaces (as cited in Leung, 2011). ICT allows employees to use office technology to manage their private affairs such as using e-mail for personal affairs and social platforms for chatting and following their interests, read the news and feeds, and follow their e-banking updates.
According to Haddon and Silverstone, the use of ICT creates a flexible connection of work-family boundaries by using multiple ICT functions such as texting, video calling (as cited in Leung, 2011).

Unlike other studies, work-related computer or laptop use was considered alongside smartphone use in the current study. The reason for considering work-related computer or laptop use is due to a few reasons: (1) computers and laptops are essentials to work technologies which exist in most workplace setting (2) most of the work-related and business software are accessed through computer systems (3) their availability in everyone’s home (4) exposure to computers and laptops might have more significant downside effects than smartphones on individuals’ mental and physical health as argued by Sahlgrenska (2009). Information & communication technology was investigated by using the Technology-Assisted Supplemental work (TATW) scale which included both work-related computer and smartphone use.

According to Wright et al. (2014), a great majority of research studies focused on examining communication technology in the workplace and its influence on job burnout. However, there is a lack of communication technology studies beyond the workplace and its contribution to burnout and also there is a lack of studies conducted on work-related ICT outside the US in which the present study will attempt to cover. According to Duranová and Ohly (2016), most of the previous research studies on ICT use have been conducted in North America. According to previous studies on ICT use during non-working hours, studies were mainly based on full-time employed and white-collar employees, e.g., managerial positions. In contrast, the current study included part-time employees from different sectors.

Working for long hours through the day drains employees’ energy, and they become exhausted by being exposed to computer screens and smartphone notifications. When returning home employees need sufficient time to recover from work-related stress which is crucial at this point because of the severe psychological, behavioral, and subjective load reaction (e.g., elevated blood pressure and fatigue) caused by job-characteristic may have serious implications on employees’ health and well-being). Think of high job demands as an example of job-characteristics where employees tend to use their cognitive abilities at work such as analyzing and concentrating for a few hours to accomplish their tasks. If employees continuously remain connected to work beyond working hours by ICT to perform work-related tasks instead of recovering, they are exposed to stressors.

According to Dunckel and Zapf and Semmer, ICT use during non-working hours is considered as a stressor because it affects the process of recovery and by hindering the process
of employees’ recovery and well-being (as cited in Duranová & Ohly, 2016). Extended exposure to work-related tasks during non-working hours slows down recovery by extending the same psychophysiological process as on a regular working day (Geurts & Sonnetag, 2006). According to the Hobfill’s Conservation of Resources (COR) theory, losing resources perceived as a stressful condition for employees. In accordance with COR theory, ICT use for work-related tasks during non-working hours can be identified as a factor that leads to losing resources such as energy level next working day. Accordingly, ICT can negatively affect recovery and well-being progress of employees (as cited in Duranová & Ohly, 2016).

A recent study by Chang et al., revealed that being exposed during the evening time to light-emitting electronic devices hinders sleeping time, disrupts the circadian rhythm, suppresses melatonin, modifies REM sleep, and reduces morning alertness (as cited in Duranová & Ohly, 2016). Furthermore, Rosen et al., argued that work-related smartphones use during the late evening reduced sleep quality, and increased exhaustion level next morning. Additionally, it reduced employees’ work engagement throughout the day. Another research study by Ayyagari et al. on techno-stress discussed the negative effects of ICT use and its influence on recovery and well-being. The results of the study revealed that, long exposure to ICT is followed by negative effects on employees’ health such as eyestrain or repetitive strain injuries (as cited in Duranová & Ohly, 2016). Based on the literature review the following hypothesis was formulated:

Hypothesis 1: work-related ICT use during non-working hours is negatively related to recovery experiences.

Occupational burnout

Occupational burnout is the outcome variable in this study; hence it is necessary to present its conceptualization, dimensions, and the most influential definitions in order to grasp the phenomenon and its relation to the current study. Burnout refers to a stress-related phenomenon that has been recognized all over the world for its serious implication for individuals as well as for the society (Chirico, 2016). According to Schaufeli and Enzmann, burnout is defined as the condition where the mental resources are withdrawn because of severe job stress, which indicates that the psychological health of an employee is at risk (as cited in Wright et al., 2014). According to Maslach & Jackson, they stated that the most common definition for job burnout among most research studies is characterized within a three-component model that defines job burnout as a psychological syndrome of emotional
exhaustion, cynicism, and decreased professional self-efficacy (as cited in Leung, 2011). Goodman and Boss (2002) defined the mentioned dimensions as the phase of burnout based on the conceptualization of Mashalch and Jackson. They stated that emotional exhaustion is considered the fundamental stress dimension of burnout, which refers to the lack of energy and feeling that emotional resources are drained. Depersonalizations is considered as the interpersonal dimension of burnout, which refers to the psychological detachment in interactions and relationships, e.g., treating clients as things or objects. Decreased professional self-efficacy is considered as the self-evaluation dimension of burnout and refers to the decreased level of job competence and work efficiency (as cited in Goodman & Boss, 2002).

During the development of occupational burnout, it was believed in the very beginning that burnout is a phenomenon related to the “helping” professions. However, burnout was studied later in customer service professions and focused extensively on human service professions. According to Jackson, Schwab and Schuler, high levels of burnout has been reported in professions such as health care and social workers, teachers, lawyers, customer service representatives, and police officers (as cited in Chirico, 2016). One reason can give an explanation why high levels of burnout are reported in those professions is due to the high-stress work environment and emotional demands of the job (Ruotsalainen et al., as cited in Chirico, 2016).

The consequences of occupational burnout are connected to several negative organizational outcomes. According to Ellis and Miller and Kim and Stoner studies have found that job burnout in organizations is connected to absenteeism, low work performance levels, and impairment in social or occupational functioning (as cited in Wright et al., 2014). Wright et al. (2014), argue that burnout outcomes can negatively affect organizational goals and create work problems, including managers who are prone to deal with stress and suffer from burnout. Felton, Webber and Reinhard, argue that the outcomes of burnout in the workplace have potential costs and increase in turnover rate and productivity decline for individuals and organizations as well as on the organization’s clients or contacts (as cited in Chirico, 2016).

In the present research study, burnout was measured by using the Copenhagen burnout inventory (CBI) due to applicability where gender, cultural and socio-economic differences were considered. According to Kristensen et al. (2005), most of the international research studies focused on measuring occupational burnout with Maslach Burnout Inventory (MBI) due to its validity and popularity among researchers. However, the researchers argued that many of the MBI questions are based on the American culture. Consequently, the scale might not work appropriately in other countries such as in Denmark where researchers struggled to
conduct the MBI questionnaire because of its complicated technical problems in back translation to Danish. One more important point to consider in the present study is that participants are based in Sweden and they did not receive their ICT devices from their employers, unlike participants in previous studies conducted in The United States. According to Finner and Renn when employees receive technical tools from their employers, they consider this effort as being supportive of their work-related tasks outside the office. Consequently, this effort created by organizations makes employees feel that they need to be available for work also during non-working hours (as cited in Derks & Bakker, 2014, p. 414).

**Recovery Experience**

To present the importance of recovery experiences on a day-to-day basis, it is essential to define its meaning and relevance to the current study. The definition of recovery experiences in this study is based on the definition by Geurts and Sonnentag (2006). They defined recovery experience as the process when individuals take a relaxation break after spending effort on work-related tasks. Spending high efforts under high work pressure or under stressful conditions may cause the psychological activation to slow down. When the psychological activation is hindered instantly it results in incomplete recovery, which causes mental indicators such as fatigue and sleep problems, as well as physiological indicators such as prolonged neuroendocrine activation and delayed cardiovascular recover.

Mejiman and Mulder, argued that the importance of recovering is that it reduces the high pressure and work-related stress levels to baseline (as cited in Sonnentag & Fritz, 2007). The recovery process is important for employees’ good performance for the next working day, and crucial for better well-being and health. According to Hartig, Johansson, and Kylin (2007), the importance of being psychologically away from the workplace can help employees recharge their energy and recover quickly. Previous studies have emphasized that recovery during non-working hours positively affect physical strength, work engagement, motivation, and enhanced performance of employees during the working day (Bakker et al., 2008).

There are four dimensions of recovery experiences proposed by Sonnetag and Fritz that is considered to restore energy and regulatory resources: psychological detachment, relaxation, mastery experiences, and control. Psychological detachment refers to the mental disengagement from one’s job during non-working hours. Detachment helps employees refrain from work-related thoughts. Relaxation refers to the low activation of the sympathetic nervous system. It is activated when one’s body and mind are calmed down. Mastery experiences refer to the experiences that are associated with challenges and learning. These experiences help
individuals distract from job demands and gain new resources, e.g., self-efficacy which help individuals overcome future job-demands. Control refers to the experiences of autonomy during non-working hours. These experiences refer to the freedom of choosing whatever activity is favorable to practice to facilitate recourses, and to cut down activities that cause stress and unpleasant feelings (as cited in Hahn et al., 2011).

To reach full recovery, psychological detachment from work is an essential element for employees to foster their recovery process. Previous studies on psychological detachment demonstrated that psychological detachment is positively related to mental health and negatively related to job stress and burnout (Shimazu et al., 2016). Unrecovered employees need to compensate their remaining energy from the day before through an additional effort. For this reason, being active psychologically with long-term incomplete recovery through the days can lead employees to struggle with physical and mental impairment (Geurts & Sonnentag, 2006). Based on this literature, the following hypothesis was formulated:

**Hypothesis 2:** Recovery experiences are negatively related to occupational burnout

**The mediating role of recovery experiences**

It is essential to determine the mediating role of recovery experiences between ICT and occupational burnout by exploring what previous studies have mentioned regarding the mediation of recovery experiences in other relationships. According to Kinnunen et al. (2011), previous studies have revealed that specific dimensions of recovery experiences such as relaxation have been shown to act as mediators between job-demands and fatigue as well as between other variables. According to them, in another research study, job demands were linked to a decrease in the dimension of mastery experiences and control during non-working hours, as job demands drained the mental and physical resources. Similarly, in this study and as mentioned in the literature review, ICT is considered as a stressor that can decrease leisure time and keep individuals cognitively busy with work affairs.

Hence, work-related ICT is expected to be linked to decreased recovery experiences during non-working hours as well as expected to be linked to occupational burnout. The relationship between work-related ICT and occupational burnout is mediated via recovery experiences. The effects of ICT are transmitted to occupational burnout through recovery experiences. In other words, employees use ICT during non-working hours in different frequencies; some employees may use work-related ICT more or less than others; however, the fact that they are exposed to job demands does not necessarily mean that they will be burned
out directly. According to Hächler, Pereira and Achim, (2017) recovery experiences can explain this relationship. Based on the literature the following hypothesis was formulated:

_Hypothesis 3:_ Recovery experiences mediate the relationship between work-related ICT use during non-working hours and occupational burnout.

Summing up the theoretical part, first, the study aim was to investigate the relationship between ICT and occupational burnout with the mediating role of recovery experiences. Second, the concerns associated with the use of work-related ICT beyond working hours and their potential effects on employees’ health and well-being were discussed in the literature review as well as the association between the variables from a psychological perspective was also discussed. Third, the hypotheses were connected to the literature and theories to make a logical understanding of the study and move to the methodology section below.

**Method**

**Participants**

Data from a convenience sample of N= 101 was collected over a duration of two months. The sample consisted of employees with part-time and full-time contracts who work in private, public, and non-profit sectors in the south of Sweden. Convenience and purposive sampling was used to carry out the research study. The selection procedure of participants was based on a selection criterion where participants might use or were expected to use work-related ICT beyond working hours. The participants were recruited to take part in the research study from different occupations where individuals expected to use work-related ICT during non-working hours such as in the healthcare care sector, business sector, and academic sector.

The sample included doctors, nurses, managers, software developers, University tutors, and HR staff at large organization. Participants were Swedish citizens with European and Middle Eastern culture backgrounds. Frequencies analysis was run to display the distribution of participants’ age and gender. Below in Table 1, 28 participants were in the age of 18-24, 56 participants in the age of 25-34, 4 participants were in the age of 35-44, 9 participants in the age of 45-54, 3 participants were in the age of 55-64, and only one participant in the age of 65-47. In terms of gender frequencies, the number of female participants was 53, which is higher than the number of male participants which was 48.
Table 1. Age and gender frequencies of participants

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>18-24 years old</td>
<td>28</td>
</tr>
<tr>
<td>25-34 years old</td>
<td>56</td>
</tr>
<tr>
<td>35-44 years old</td>
<td>4</td>
</tr>
<tr>
<td>45-54 years old</td>
<td>9</td>
</tr>
<tr>
<td>55-64 years old</td>
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<tr>
<td>65-74 years old</td>
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<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>48</td>
</tr>
<tr>
<td>Female</td>
<td>53</td>
</tr>
</tbody>
</table>

Sampling procedure

For the recruiting process, several companies in Växjö region of Smaland was contacted by e-mail to participate in the research study. In addition, acquaintances from numerous sectors were contacted privately by e-mail with a request to participate in the web-based online questionnaire created with Google form. The survey was conducted in English language. All volunteers were provided with a clear explanation of the purpose of the study in a cover letter attached through an e-mail. Participants were asked firstly to fill out the questionnaire information about demographics variables and subsequently to fill out the assessment questionnaire during or after work.

Volunteers were given a duration of three weeks for submitting the questionnaire. Participants were provided with the manual instructions how to complete each part of the questionnaire and also they were provided with my contact information in case of questions arising while filling out the questionnaire. The ethical standards considered when distributing the online questionnaire since volunteers were informed beforehand in the cover letter that their responses are anonymous and used solely for research purposes. Additionally, respondents were informed about the right to withdraw from the study at any point (See Appendix A and B for more information on the questionnaire and cover letter).

Measuring instruments

Copenhagen Burnout Inventory (CBI). Occupational burnout was measured with the CBI scale (Kristensen et al., 2005) in this study to measure the degree of fatigue and exhaustion
experienced by respondents. The measurement included three sub-dimensions: Personal burnout (e.g., ‘How often are you emotionally exhausted’), work-related burnout (e.g., ‘Do you feel that every working hours is tiring for you’), and client-related burnout (e.g., ‘Do you feel that you give more than you get back when you work with clients’). The measurement has 19 items answered on a Likert scale with five responses ranging from 0= never to 4= very frequently. The mean score was computed to distinguish higher-levels from lower-levels of burnout experienced by respondents in each sub-scale. Higher mean scores indicated high-level of burnout and lower mean scores indicated the opposite. The measurement was conducted in the English language. Previous research by Milfont et al. (2007) indicated that the CBI questionnaire is a reliable and valid measure to assess burnout in different occupations and the three sub-scales met the criteria of construct validity. The reported Cronbach’s alphas in the present study for the sub-scales were high: Personal burnout .87, Work burnout .82, and Client burnout was .78. The reported Cronbach’s alpha of the internal reliability for the entire scale was .91.

Technology-Assisted Supplemental Work (TATW). The questionnaire was developed by Fenner and Renn (2010) and used in this study to measure the frequent use and engagement of participants with work-related ICT such as computers and smartphones during non-working hours. The questionnaire has six items rated on a Likert scale from 1= never to 5= always. One example of an item in this scale includes ‘I perform job-related tasks at home, at night, or on weekends, using my cell phone, pager, Blackberry or computer’. The terms, Blackberry and Pager, were deleted from the items due to the lack of using such devices nowadays. The reported Cronbach’s alpha in the present study for the six items scale was .82.

Recovery Experience Questionnaire (REQ). The questionnaire was developed by Sonnentag and Fritz (2007) and used in this study to assess the recovery experiences of participants during non-job time. Participants were asked to respond to the items in this questionnaire with regard to their free time. The measurement has four subscales for recovery: psychological detachment, relaxation, mastery, and control. The scale has a total of 16 item scored on a 5-point Likert scale ranging from 1= totally disagree to 5= totally agree with attention to employees’ non-job time. Each subscale is measured with four-items. Psychological detachment (e.g., ‘I distant myself from my work’), Relaxation (e.g., ‘I do relaxing things’), Mastery (e.g., ‘I seek out intellectual challenges’), and Control (e.g., ‘I feel like I can decide for myself what to do’). The four subscales had good internal consistencies and were designed in a way that the questions did not put pressure and time demands on the study participants (Sonnentag & Fritz, 2007). The four scales of the questionnaire were
validated by Sonnentag and Fritz (2007) which demonstrated good internal consistencies. Similarly, in the present study, the scale showed high reliability with a reported Cronbach’s coefficient alpha value of .83. The reported alpha value for the sub-scales: Psychological detachment was .83, Relaxation .83, Mastery .81, and Control .81.

**Statistical analysis**

Data analyses were carried out using SPSS version 24. Descriptive analysis was used to determine if the variables were normally distributed, and also to describe the main characteristics of the study sample. The statistical measures used for the analysis are mean, standard deviation, Cronbach's alpha, correlation and regression analysis, mediation analysis and Sobel test. The analysis of skewness and kurtosis was run to check for the assumption of normality. The results showed that the data was normally distributed within the standard deviation. Analysis of missing values was run to check if there was any missing data. The results showed that there was no internal missing data. Simple linear regression analysis was conducted in order to estimate the relationship between variables including independent and dependent variables. Simple linear regression was also used to determine the need for mediation analysis.

Three separate lines regression models were made to represent the paths of interest for the Sobel test. To run the Sobel test, a syntax developed by Dudley and Benuzillo (2004) was copied and used into the SPSS. Sobel test was used to determine if the mediated effect is significant by looking at the standard error (as cited in Baron & Kenny, 1986). The reason behind using Sobel test in the present case is due to the simple mediation and also due to its effectiveness in finding if the affect of X on Y is significantly reduced upon the addition of a mediator to the model as Preacher and Hayes (2004) argued. According to Mackinnon and Fairchild (2009) mediator refers to the variable that transfers the effect of an antecedent variable on to a dependent variable. They argued that mediating variables are very useful to understand and facilitate the relationship between variables, and why they are related to each other. According to them, the antecedent variable has an effect on the mediator variable and in turn the mediator variable effects the dependent variable. According to Baron and Kenny, Judd and Kenny, the importance of the mediator variable is that it creates a chain of relations between the variables (as cited in Mackinnon & Fairchild, 2009).
Results

Descriptive statistics was run as mentioned above to check for data distribution and sample characteristics. The descriptive statistics of the sample in Table 2 includes mean scores, minimum and maximum values, and standard deviation.

<table>
<thead>
<tr>
<th>Recovery Experiences</th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
<th>N</th>
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<tbody>
<tr>
<td>Psychological detachment</td>
<td>11.51</td>
<td>3.69</td>
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<td>20</td>
<td></td>
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<tr>
<td>Relaxation</td>
<td>15.32</td>
<td>3.03</td>
<td>4</td>
<td>20</td>
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<tr>
<td>Mastery</td>
<td>16.29</td>
<td>2.77</td>
<td>7</td>
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<tr>
<td>Control</td>
<td>16.19</td>
<td>2.81</td>
<td>4</td>
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<td></td>
<td>20.10</td>
<td>5.22</td>
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<td>28</td>
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<table>
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<th>SD</th>
<th>Min</th>
<th>Max</th>
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</thead>
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<td>Personal-burnout</td>
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<td>3.80</td>
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<td>Work-burnout</td>
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<td>5.05</td>
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<tr>
<td>Client-burnout</td>
<td>15.18</td>
<td>4.69</td>
<td>6</td>
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</tbody>
</table>

A Pearson correlation analysis was conducted to estimate the association between the study variables ICT use, recovery experiences, and occupational burnout. As presented in Table 3 below, the results for hypothesis 1 showed that there is a significant negative correlation between ICT use and recovery experiences, \( r (99) = -.22, n= 101, p = .011 \). The results indicated a medium negative correlation between ICT use and recovery experiences. That means increase in ICT use was associated with a decrease in recovery experiences across participants. The results for hypothesis 2 showed that, there is a medium negative correlation between recovery experiences and occupational burnout, \( r (99) = -.41, n= 101, p <.001 \). That mean, decline in recovery experiences associated with an increase in occupational burnout across participants. A Pearson correlation was also computed between occupational burnout and ICT use to prepare for mediation analyses. The results showed no significant correlation between ICT use and
occupational burnout, \( r(99) = 0.052, n=101, p = .303 \). That means, increase or decrease in ICT is not significantly related to increase or decrease in occupational burnout.

**Table 3.** Pearson correlations between ICT use, recovery experiences, and burnout

<table>
<thead>
<tr>
<th></th>
<th>ICT</th>
<th>Recovery experiences</th>
<th>Occupational Burnout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>ICT Correlation Coefficient: -.227</td>
<td>.052</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed): .011</td>
<td>.303</td>
<td></td>
</tr>
<tr>
<td>Recovery experiences</td>
<td>ICT Correlation Coefficient: -.227</td>
<td>-.419</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed): .011</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Occupational burnout</td>
<td>ICT Correlation Coefficient: 0.052</td>
<td>-.419</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed): .303</td>
<td>.001</td>
<td></td>
</tr>
</tbody>
</table>

Note. Correlation is significant at the 0.05 level (2-tailed)

Independent-samples t-tests were conducted to determine whether there is a statistically significant difference between the means in female and male participants in occupational burnout, recovery experiences, and work-related ICT use. As presented in Table 4 below, there was no statistically significant difference in the scores for occupational burnout for male and female participants. For recovery experiences there was no statistically significant differences in the scores for male and female participants. For work-related ICT use there was no statistically significant difference in the scores for male and female participants.

**Table 4.** T-tests for gender differences in occupational burnout, recovery experiences, and ICT use

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>T</th>
<th>Sig.(2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupational burnout</td>
<td>Female</td>
<td>48</td>
<td>51.79</td>
<td>13.47</td>
<td>1.52</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>53</td>
<td>48.09</td>
<td>10.83</td>
<td></td>
</tr>
<tr>
<td>Recovery experiences</td>
<td>Female</td>
<td>48</td>
<td>-1.46</td>
<td>8.78</td>
<td>-1.74</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>53</td>
<td>1.32</td>
<td>7.20</td>
<td></td>
</tr>
<tr>
<td>ICT</td>
<td>Female</td>
<td>48</td>
<td>.26</td>
<td>4.81</td>
<td>.486</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>53</td>
<td>-.24</td>
<td>5.59</td>
<td></td>
</tr>
</tbody>
</table>
A Sobel test was run to check if recovery experiences act as a mediator. The results of the three mediated regression analyses showed that recovery experiences act as a mediator (suppressor variable) between work-related ICT and occupational burnout. As shown in Figure 1 below, the standardized regression coefficient in Path A between ICT and recovery experiences was statistically significant (p= .023), as was the standardized regression coefficient in Path B between recovery experiences and occupational burnout (p <.001). However, the standardized regression coefficient in Path C between ICT and occupational burnout was not statistically significant (p= .235), which is considered as inconsistent mediation. The test for estimating the effect size and the computation of power and the indirect effect used by Kenny (2018) approach. The results showed a medium effect size of .09. That confirms that ICT use has an effect on occupational burnout, however, ICT use also has an effect on recovery experiences, and recovery experiences then has an effect on occupational burnout.

![Figure 1](image-url)  
*Figure 1.* Standardized regression coefficients for the relationship between ICT and burnout as mediated by recovery experiences. The standard regression coefficient between ICT and burnout, controlling for recovery experiences is in parenthesis. *p= .235

**Discussion**

The primary purpose of this study was to examine the relationship between information and communication technology use with occupational burnout. The second purpose was to examine if recovery experiences mediate the relationship between both variables. The results of the study indicated that hypothesis 1 was supported. Work-related ICT use during non-
working hours was negatively related to recovery experiences. Employees’ use of work-related technology beyond working hours negatively affect recovery experiences. Looking at the results of Pearson correlation analysis (See table 3) and integrating them with Hobill’s Conservation of Resources (COR) theory, losing resources cause stressful conditions for employees. Hence, in accordance with COR theory, work-related ICT use during non-working hours can be identified as a factor that leads to losing mental and physical resources (as cited in Duranová & Ohly, 2016).

Hypothesis 2 was supported showing that recovery experiences are negatively related to occupational burnout. The less recovery employees experience during non-working hours, the more likely they would be prone to occupational burnout. An explanation of the results would be to integrate the current findings with previous research results. Hakanen and Baker (2017), argued that exposure to high levels of cognitive demands during free time cause poor recovery, which puts employees at a high risk of suffering from burnout. Geurts, argued that insufficient recovery during non-work hours is associated with chronic stress and health impairments (as cited in Hächler, Pereira and Achim, 2017). Further, according to the job demands-resources (JD-R) model of burnout developed by Demerouti, Bakker, Nachreiner, and Schaufeli, when employees’ job demands are high and when job resources are limited due to negative working conditions employees are likely to experience decline in working motivation and learning opportunities (as cited in Bakker, Demerouti, Taris, Schaufeli, Schreurs, 2003).

Hypothesis 3 was supported showing that recovery experiences mediate the relationship between work-related ICT during non-working hours and occupational burnout. Previous research on recovery experiences as a mediator by Kinnunen et al. (2011) found that recovery experiences are affected by stressors and high job-demands. Thus, according to Soderstrom, poor recovery experiences were found to be the antecedents of burnout (as cited in Kinnunen et al., 2011). However, it is important to mention at this point that there is a lack of research available on recovery experiences as a mediator and more research is required to explore the mechanism of recovery experiences and their connection role with occupational burnout.

Limitations and future research

The present research study has a few limitations to consider when interpreting the findings and make generalizing. The first limitation was the culture differences of participants’ background and culture which possibly can influence the results of the study. Participants were Swedish citizens from European and Middle-Eastern cultures. According to Dolnicar and Grun
(2007), cultural differences can be a potential source of misinterpretation, and also it is expected to increase the amount of variability in the response patterns explained by culture. The second limitation was the language fluency since English is a secondary language for most of the participants, this can influence the interpretations of few questions in the questionnaire. To avoid misinterpretation of questions, future research is recommended to write the questionnaire in participants’ native language instead of foreign language. The third limitation was that the current study relied on information collected from a self-reported questionnaire. Participants may have been subject to be biased when reporting on personal questions such as ‘How often do you think I can’t take it?’. Participants may be conservative about telling the real experience. As a result, they might respond positively to similar questions.

The fourth limitation was in the questionnaire survey since it did not include a question about the participants’ professions in the demographics. It is difficult for the researcher to identify which working environment requires intensive use of work-related ICT and which profession is more likely to cause a high level of burnout than the other. Hence, asking for the nature of profession or work in future research would be very insightful to identify the working environment and to give an explanation of the results. The Fifth limitation of the questionnaire survey was the way the participant’s age was measured. Multiple answers were sorted in a categorical order, e.g., “18-24 years old” which resulted in limitations for descriptive statistics when asking e.g., mean, standard deviation, minimum and maximum. The sixth limitation was in the TATW scale which was used to assess work-related ICT use during non-working hours. The scale included only six general questions about employees’ attitude towards ICT during non-working hours, which makes a problematic task for the researcher to identify how each participant used ICT, e.g., which software was used the most to complete work-related tasks, internet use, e-mail use, and reactions towards notifications. This lack of determination in the questionnaire justifies the need for developing a comprehensive assessment scale.

Conclusion

Work-related ICT use beyond working hours increases employees’ emotional demands and workload. This prolonging to ICT leads to the development of cognitive overload due to lack of insufficient recovery experiences during the evening hours. Consequently, cognitive overload leaves employee’s health at risk of burnout. In conclusion, the current research assessed the downsides risk of employees’ use of work-related ICT beyond working hours and
considered their daily recovery during the evening hours and its contribution to the psychological well-being and escalation of burnout. The research findings contribute to the understanding of the always-connected phenomenon, and in a way to other research studies on work-related technologies beyond the workplace. From an organizational viewpoint, it is for the benefit of employers to be aware of work-related ICT consequences and to promote recovery for healthier organizational members.
References


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Appendix A. Cover letter

Dear Participant,

My name is Adam Khawaled, I am a Master student from the Department of Psychology at Linnaeus University, currently working on my thesis project investigating employee’s use of work-related technology during non-working hours and its connection with occupational burnout. I am looking for respondents that potentially use smartphone or computer during non-working hours for work-related tasks e.g. reading and responding to e-mails, writing feedback and reports, phone calls etc. I would really appreciate your help if you participate in this survey.

Before you begin here are few important notes to consider about the survey:

- The survey will take approximately 7-10 minutes to complete.
- You have the right to withdraw from the research study at any point.
- You may complete the survey during work hours.
- The survey is anonymous and completely confidential.
- At the beginning of the questionnaire there are a few questions that ask how long you have worked here, your age, what your role here is, and your department. These questions will not be used to try to figure out “who said what.” Rather, they will be used to find out how different groups of people feel about the use of work-related technology during non-working hours for job-related tasks.
- Survey responses will be accepted until {20th March}.

To take the survey, go to this location on the Internet:
https://goo.gl/forms/MaKQ0DOR0cdzoK3o1

Thank you in advance for your assistance with this matter.

Sincerely yours,
Adam Khawaled
Appendix B. Web-based questionnaire about information connected technology, recovery experiences, and occupational burnout (Part of the web-based survey).

About:
I am a Master student at the Department of Psychology at Linnaeus University in Sweden, currently conducting a research for my thesis project on employees' use of work-related technology during non-working hours and its contribution to burnout. The collected data will be used only for learning purposes in this Master project. I kindly ask you to take 10 minutes of your time and choose the suitable answer for the question. Your responses are completely confidential. I really appreciate your input!

1. What is your age?
   A. 18-24 years old  B. 25-34 years old  C. 35-44 years old  D. 45-54 years old  
   E. 55-64 years old  F. 65-74 years old

2. What is your gender?
   A. Male  B. Female  C. Third gender

3. Which best describes your employment situation?
   A. Working full-time  B. Working part-time

4. Which best describes the organization you work for?
   A. Public sector (e.g. government)  B. Private sector (e.g. most businesses and individuals)  C. Not-for-profit sector

**Technology use during non-working hours**

**Instruction:** For each question, choose the correct answer that suits you the most from the multiple-choice List.

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Very often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When I fall behind in my work during the day, I work hard at home at night or on weekends to get caught up by using my smartphone</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I leave my smartphone turned off and do not use my computer for work-related tasks when I return home from work at night.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I perform job-related tasks at home at night or on weekends using my smartphone or computer.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I feel my smartphone or computer is helpful in enabling me to work at home at nights or on weekends.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. When there is an urgent issue or deadline at work, I tend to bring work-related tasks from home at night or on weekends and use my smartphone or computer to perform work-related tasks.

6. I ignore job-related tasks at home at night or on weekends using my smartphone or computer.

Occupational burnout questionnaire

Instruction: for each question, choose the correct answer that suits you the most from the multiple choice List.

<table>
<thead>
<tr>
<th>Never/Almost never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How often do you feel tired?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. How often are you physically exhausted?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. How often are you emotionally exhausted?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. How often do you think ’I can't take it’?</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. How often do you feel worn out?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. How often do you feel weak or susceptible to?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Is your work emotionally exhausting?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Do you feel burnout because of your work?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Does your work frustrate you?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Do you feel worn out at the end of the working day?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Are you exhausted in the morning at the thought of another day at work?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Do you feel that every working hour is tiring?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Do you have enough energy for family and friends during leisure time?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Do you find it hard to work with clients?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Do you find it frustrating to work with clients?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Does it drain your energy to work with clients?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Do you feel that you give more than you get back when you work with clients?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Are you tired working with clients?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>