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CONTENTS

⬢ Research

▲ Experiences & Tools

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Unveiling the social media maze: Exploring the impact of demographics on addiction, FOMO, and well–being in Pakistani youth

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ABSTRACT. L'obiettivo di questo studio è stato determinare la connessione tra la dipendenza dai social media, la paura e l'ansia di essere esclusi (FOMO) e il benessere psicologico dei giovani adulti. Il campione era composto da 202 studenti universitari maschi e 198 femmine, ciascuno di età compresa tra i 18 e i 24 anni. Per la raccolta dei dati sono state utilizzate la *Bergen Social Media Addiction Scale*, la *Fear of Missing Out Scale* e la *Psychological Well–being Scale*. I risultati hanno rivelato una forte correlazione tra salute psicologica, FOMO e dipendenza dai social media evidenziando una capacità maggiore nel gestire lo stress nei soggetti di sesso femminile.

SUMMARY. As the world grows more digital and people use social media more frequently due to social media addiction and the fear of missing out on anything, the world and various trends change daily. These changes influence young adults' psychological well–being. The goal of this study was to determine the connection between social media addiction, FOMO, and young adults' psychological wellness. Cross–sectional research design and deliberate sampling were both used to gather data for this study. 202 male and 198 female university students, each between the ages of 18 and 24, made up the sample. The Bergen Social Media Addiction Scale, the Fear of Missing Out Scale, and the Psychological Well–being Scale ere used to collect the data. The findings revealed an overall favorable correlation between psychological health, FOMO, and social media addiction. Female young adults are better at handling stress than male counterparts, and there is a strong correlation between psychological health and FOMO among young adults.

Keywords: *Fear of missing out, Psychological well–being, Social media addiction*

INTRODUCTION

Our daily lives now involve social media use, and it appears that teens and young adults make up most users (Kemp, 2017; Marengo, Longobardi, Fabris & Settanni, 2018; Rideout & Robb, 2018; Settanni, Marengo, Fabris & Longobardi, 2018). Teenagers can use social media to stay in touch with people, expand their network of contacts, find, and share resources, and construct their social identities in relation to their peer groups, particularly in terms of popularity and, consequently, acceptance and a sense of belonging (Badenes–Ribera, Fabris, Gastaldi, Prino & Longobardi, 2019; Barker, 2019).

Recent estimates place the global population's usage of social media at 58.4%. People used social media for an average of two hours and twenty–seven minutes every day (Chaffey, 2022). The widespread adoption of smartphone devices worldwide and the advancements in information and communication technologies may be contributing factors to the popularity of social media usage. Indeed, the smartphone penetration rate in Vietnam, a low– and middle–income nation, is predicted to be 73.5%, and it is expected to rise to 85% by the end of 2022 (Dharamraj, 2022).

Other factors contributing to the rise in social media use among people are the ease with which people can connect and establish virtual relationships that are unrestricted by distance, in addition to the ease with which people can communicate (Cheng, Lau & Luk, 2020). Information exchange is also made possible by social media. Yoon and colleagues (Yoon, Wee, Lee, Lin & Thumboo, 2021) have previously emphasized the ways in which social media has been utilized to actively involve patients and the public. Although there are undoubtedly many advantages to using social media, there have been growing worries in recent years about using social media excessively.

Social media addiction

Previous research has looked at the effects of social network addiction, such as Facebook addiction, and how that affects a person's psychosocial functioning. For instance, Busalim and colleagues (Busalim, Masrom & Zakaria, 2019) documented how Facebook addiction resulted in decreased academic performance for students who were not hooked, and how self–esteem negatively impacted Facebook addiction for those students. They have also been studied in recent years due to the growing popularity of other social media platforms like Instagram. D'Souza and Hemamalini (2018) investigated the connection between 131 Indian students, ages 12 to 23, and Instagram addiction and depression. They found a correlation between an individual's depressed scores and the intensity of their Instagram addiction. In more recent times, research has looked at the prevalence of social media addiction as well as the ways that using various platforms might lead to different degrees of addiction. Compared to more traditional platforms like WhatsApp and Tik Tok, people who used more visual social media platforms like Instagram and Tik Tok also showed greater levels of social media addiction (Marengo, Fabris, Longobardi & Settanni, 2022).

Fear of missing out

Today's young adults begin and conclude their days by checking the social networking and messaging apps on their phones. Today's kids use social media extensively to build and maintain relationships with others. FOMO, or the fear of missing out, has received a lot of attention lately. According to Przybylski and colleagues (Przybylski, Murayama, DeHaan & Gladwell, 2013), FOMO is the need to maintain social connections with friends and groups through social media, which leads to regular (and sometimes excessive) use of social media and chat apps.

FOMO was first popularized in the media in the early 2010s, and since then, the use of social networking sites has increased dramatically all around the world (Poushter, Bishop & Chwe, 2018). Numerous research investigating this phenomenon show that there is a noticeable increase in this psychological inclination. There haven't been any real initiatives to compile the body of information on FOMO, despite the growing attention from academics (Tandon, Dhir, Almugren, AlNemer & Mäntymäki, 2021). Everyone is starting to have the strong need to check social media sites on their smartphones on a regular basis.

Since almost everyone has a smartphone, it is now quite simple for people to find out about potentially fulfilling experiences – both online and offline – that they may have missed in their lives. FOMO has been portrayed in the media as an anxiety–inducing concept. According to a survey, Facebook is one of the most widely used networking apps among Indian youth, with young people in the country setting the

global standard for usage. Facebook's widespread use among young people, particularly college–bound students, raises the question of what motivates and encourages them to utilize the social media platform. One is social attachment, which is regarded as one of a person's most basic needs (Lai et al., 2013).

People are become increasingly reliant on social media platforms to satisfy their social demands. The need to connect, the need to establish and nurture meaningful relationships with people, and the desire to become well–liked in your network (Santor, 2000). Numerous scholars have attempted to investigate the connection between college–bound kids' use of social media and their involvement on social networking sites and the impact this has on their mental wellness. The phrase fear of missing out (FOMO) refers to the excessive and regular usage of social media to maintain a sense of social connection. It is characterized as the intense desire to maintain interpersonal relationships while keeping track of all events and activities on social media. Interaction with social media platforms that enable personal social media participation and provide a means of continuous monitoring and comparison with others (Przybylski et al., 2013).

Psychological well–being

According to Oberst and colleagues (Oberst, Wegmann, Stodt, Brand & Chamarro, 2017), those with a strong predisposition toward FOMO have a compulsive desire to use social media, which negatively impacts their perception and negatively impacts their cognitive states, both of which have an immediate impact on an individual's well–being (Marino et al., 2018).

One way to conceptualize well–being (WB) is as an abstract, highly personalized concept whose meaning is always changing. As such, it is challenging to quantify. According to research in this field, there are two types of well–being: hedonic and eudaimonic. According to Ryan and Deci (2001), hedonistic theorists often view well–being in terms of pleasure versus unhappiness. Research on hedonic well–being employs subjective well–being (SWB), which is made up of life satisfaction and positive and negative affect, as an evaluation metric. In contrast to the hedonic definition of happiness, eudaimonic psychologists gauge work–life balance (WB) based on an individual's lifestyle and sense of fulfillment (Ryff & Keyes, 1995; Ryff & Singer, 2000).

Everyone aspires to psychological well–being, among other things. Psychological well–being, according to Ryff (1995), is the capacity of an individual to identify and grow in line with their potential. According to Ryff (1989), a person's ability to act mentally in a positive way is another indicator of their psychological well–being. Moreover, those with high psychological well–being will be more productive and have better mental and physical health than people with low psychological well–being, according to Ryff and Singer (2000). According to Huppert (2009), prosocial behavior, good health, and adaptable and creative thinking are all indicators of psychological well–being.

On the other hand, according to data from the World Health Organization (WHO), the proportion of individuals with mental illnesses rose by more than 18% between 2005 and 2015, backed up by a 2016 statement from the Republic of Indonesia's Ministry of Health asserting that mental health issues continue to rank among the major global health concerns, including those that affect Indonesia. According to data from Basic Health Research in 2013, there are around 14 million people, or 6% of Indonesia's population, who suffer from mental emotional illnesses, which are characterized by symptoms of anxiety and depression for those under the age of fifteen. This suggests that many people continue to have poor psychological well–being. The Twenge and colleagues survey (Twenge, Martin & Campbell, 2018) results provide more evidence that the proportion of young adults (18 to 25 years old) experiencing depressive symptoms rose by 63% between 2008 and 2017.

Additionally, there was a 71% rise in the proportion of young adults reporting severe psychological discomfort. Suicidal thoughts among young adults grew by 47%, according to similar trends. Fear of missing out, or FOMO, was identified by Przybylski et al. (2013) as one of the factors that contributed to the low psychological well–being. Beyens and colleagues (Beyens, Frison & Eggermont, 2016) provide evidence in favor of this claim, stating that FOMO is indicative of poor psychological health. The existence of fear, anxiety, and worry (FOMO) makes a person feel uncontrollably anxious, unable to form healthy relationships with others, and low in self–acceptance. This is why the negative indicator was present.

The usage of social media in the current digital age, when most people are undoubtedly familiar with it, was strongly linked to this phenomenon. Social media has made it possible to communicate without being constrained by time or space. People can now easily obtain fresh knowledge and engage in

active communication with others thanks to social media (Burke, Marlow & Lento, 2010). These days, people are drawn to social media because it is a convenient and crucial tool for sustaining social connections and meeting social demands (Shapiro & Margolin, 2014). As a result, social media now plays an indispensable role in many aspects of daily life (Lenhart, 2015). But social media has its own advantages and disadvantages in addition to its widespread use. When social media is used responsibly, benefits can result, including the ability to quickly obtain health information from professionals in the field, emotional support, community building, and more (Royal Society for Public Health, 2017). On the other hand, improper use of social media can have unfavorable effects.

Oberst and colleagues (Oberst, Renau, Chamarro & Carbonell, 2016) claim that children, adolescents, and early adults' psychological health and functioning may suffer because of using maladaptive social media. Twenge et al. (2018) concur, stating that social media use is probably to blame for the rise in mental health issues among young adults. Social media users come in a variety of age groups, however Sugiharto (2016) notes that young people in Indonesia who are between the ages of 20 and 24 make up most internet users. Approximately 22.3 million people in this age bracket were found to be internet users, the majority of whom use the internet to access social media.

According to data issued by the Indonesian Internet Service Providers Association (APJII), most respondents said they used the internet for more than six hours each day. Approximately 55.39% of all respondents use the internet for more than six hours each day. Some responders, however, range from two to six hours every day. Those who are between the ages of 20 and 24 are considered emerging adults. An individual is expected to not only develop and accomplish their personal goals at this stage, but also initiate a new developmental process by forming relationships with others. at this stage, individuals may encounter new activities and goals that directly include other people for the first time (Salkind, 2006). However, emerging adults are also particularly vulnerable to social media dependency, according to research by Azka and colleagues (Azka, Firdaus & Kurniadewi, 2018). This is because they are typically less stable in their ability to manage their basic needs, form interpersonal relationships, and develop both affective and cognitive aspects of their lives. Thus, people who encounter challenges in their developing process often turn to social media as a means of escape.

Social media usage is on the rise in Pakistan, especially among young adults. According to the Global Digital Report 2022 (Kemp, 2022), there were 50 million social media users in Pakistan, with a penetration rate of 23% of the population. Understanding the implications of this trend on young adults' well–being is crucial. With the increasing use of social media, there's a growing concern about social media addiction. Recent research by Marino, Gini and Vieno (2022) discusses the emergence of problematic social media use and its impact on mental health. Fear of missing out (FOMO) is a psychological construct that has become increasingly relevant in the digital age.

A study by Oberst et al. (2017) demonstrates the relationship between FOMO and problematic smartphone use, which can be extended to social media platforms. Demographic factors such as age, gender, socioeconomic status, education, and cultural background can play a moderating role in the relationship between social media use, FOMO, and psychological well–being. Recent work by Montag et al. (2022) highlights the importance of considering demographic factors in understanding social media addiction and its consequences. Young adults are particularly vulnerable to the effects of social media due to their age and life stage. Understanding how social media addiction and FOMO influence their psychological well–being is essential for promoting their mental health and academic success. Pakistan has a distinct cultural context, and social media usage can be influenced by cultural norms and values. A study by Ali, Malik and Malik (2022) explores the impact of cultural factors on social media usage and well–being in Pakistan. It is crucial given the rapid increase in social media usage in Pakistan, the emerging concerns about addiction and FOMO, the relevance of demographics and the unique cultural context of Pakistan. It has the potential to provide valuable insights into the well–being of young adults and contribute to the development of targeted interventions and policies.

Hypotheses

1. Addiction to social media will have a significant influence on young adults' psychological health.
2. Young adults' psychological health will be negatively correlated with their fear of missing out.

3. The psychological health of young adults will differ significantly by gender.
4. Demographic variables (education level and skipping meals due to social media use) will act as a moderator in the relationship of study variables among young adults.

METHOD

Operational definitions

– *Social media addiction*. SMA is the phenomenon that refers to the compulsive desire to use social media. The user feels forced to utilize social media to feel fulfilled despite the time and effort expended (Andreassen, Torsheim, Brunborg & Pallesen, 2012).
– *Fear of missing out*. Fear of missing out is described as the persistent concern that others might be having worthwhile experiences while one is away and is characterized by the need to always stay connected with what other people are experiencing (Przybylski et al., 2013).
– *Psychological well–being*. Psychological well–being is a sort of well–being that is based on the idea of fundamental human needs and effective functioning. It serves as an example of realizing one's potential and accepting reality (Diener et al., 2009).

Participants

Data were gathered using the method of purposeful sampling. 400 young adults (M = 202, F = 198) from a variety of universities, including University of Wah (Wah Cantt), Comsats University (Wah Cantt), Foundation University (Rawalpindi), and Bahria University (Islamabad) were included in the sample. The participants' range in age from 18 to 24 (M = 20.91, SD = 1.95).

Instruments

– *Demographic data sheet*. Age, gender, education level, family structure, father's and mother's employment status, time spent on social media, skipped meals due to social media, feelings of social isolation, disturbed sleep patterns, and daily app usage are all gathered from participants' personal information using a demographic data sheet.
– *Bergen Social Media Addiction Scale*. The six items on the *Bergen Social Media Addiction Scale*, developed by Andreassen et al. in 2016 asses problematic social media use over a twelve–month period, rated on a 5–point Likert scale, with 1 = very seldom, 2 = rarely, 3 = occasionally, 4 = frequently, and 5 = very frequently. According to Andreassen et al. (2016), the greatest figure suggests a dependency on social media. The Cronbach's alpha coefficient for the *Bergen Social Media Addiction Scale* is .88, validated by Andreassen et al. (2016).
– *Fear of Missing Out Scale*. The most popular tool for measuring FOMO is Przybylski et al. (2013)'s 10–item scale, which rates FOMO in terms of a scale of 1 to 5 (i.e., 1 = not at all true of me, 2 = slightly true of me, 3 = moderately true of me, and 4 = very true of me). More points on the Likert scale indicate a higher level of FOMO. The Cronbach's alpha coefficient for the scale's English translation is .90 (Przybylski et al., 2013), validated by Elhai and colleagues (Elhai, Levine, Dvorak & Hall, 2016).
– *Psychological Well–being Scale*. The *Psychological Well–Being Scale* was developed by Diener et al. (2009) and consists of eight items that define important aspects of how people operate, such as having meaningful relationships, feeling competent, and having a purpose in life. From 1 (strongly disagree) to 7 (strongly agree), there are seven possible outcomes. Specifically, 1 = strong disagreement, 2 = disagreement, 3 = slight disagreement, 4 = disagreement that is neither strong nor weak, 5 = slight agreement, 6 = general agreement, and 7 = strong agreement. According to Diener et al. (2009), this scale has a Cronbach's reliability of .86. The scale has been renamed the *Flourishing Scale*, and it now measures how respondents see their own success in important domains like relationships, self–esteem, purpose, and optimism. The scale yields a single psychological well–being score.

Procedure

Respondents first provided their informed consent. Purposive sampling was utilized to gather data because it gives us access to interesting demographic traits that will best allow us to evaluate our hypothesis. We tried to choose individuals from a variety of age groups, backgrounds, and educational contexts to guarantee sample representativeness.

Furthermore, the concepts of saturation were utilized to select the sample size, guaranteeing enough participants to adequately investigate the study inquiries. Additionally, by specifying the selection criteria precisely and making sure that participants fulfilled them before being included in the study, an attempt was made to reduce bias. 450 young adults from various universities in Wah Cantt, Rawalpindi, and Islamabad provided the information. Individual questionnaires were handed to each participant, and they received instructions on how to complete them. The confidentiality of all collected data has been ensured.

Data analysis

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS). The link between social media addiction, FOMO, and psychological well–being among young adults is examined using Pearson Product Moment Correlation (PPMC). Gender differences were looked at using the independent sample *t*–test.

RESULTS

Table 1 explains the frequency and percentage of demographic variables of the participants included in the study. There were both males (202) and females (198) in the study. The age range was 18–24. Mostly participants (61.5%) belonged to nuclear family system as compared to joint family system (38.5%). There were 91.8% young adults with BS (Bachelor of science) and 8.3% young adults with MS (Master of science).

The mean, range, standard deviation, skewness, kurtosis, and alpha reliability values for the subscales and scales are displayed in Table 2. The degree of skewness and kurtosis indicates that the data is normally distributed, and the adequate inter–item consistencies are supported by scale alpha reliability.

The results of the correlation analysis in Table 3 indicated a significantly positive relationship between fear of missing out and psychological well–being among young adults, indicating the fear of missing out predicts good well–being of young adults.

Table 4 shows that there are significant gender differences in psychological well–being of young adults. Female young adults have better psychological well–being and are capable of handling stressors than the males.

Table 5 illustrates the model fit indices of the scale of SMA. Model 1 represents the fit indices for default model with χ^2 *df* = 9 is with the value of CFI = .90, IFI = .90, NFI = .87 and RMSEA = .08. The validity indices of Normed Fit Index (NFI), Incremental Fit Index (IFI) and the Comparative Fit Index (CFI) are in acceptable range. Moreover, the value of Root Mean Square Error of Approximation (RMSEA) for the model is also in acceptable range.

It is indicated by the Figure 1 that all the items of social media addiction scale have adequate factor loadings. Hence no covariances were included.

Table 6 illustrates the model fit indices of the scale of FOMO. Model 1 represents the fit indices for default model with χ^2 *df* = 35 is with the value of CFI = .68, IFI = .69, NFI = 65. and RMSEA = .12, except RMSEA all values of model were out of desired limit.

Model 2 exhibits the values after adding co–variances to achieve goodness of model fit. The validity indices of Normed Fit Index (NFI), Incremental Fit Index (IFI) and the Comparative Fit Index (CFI) in Model 2 are in acceptable range. Moreover, the value of Root Mean Square Error of Approximation (RMSEA) for the model is also in acceptable range, which are below .06.

It is indicated by the Figure 2 that all the items of social media addiction scale have adequate factor loadings after addition of co–variances.

Table 7 illustrates the model fit indices of the scale of PWB. Model 1 represents the fit indices for default model with χ^2 *df* = 20 is with the value of CFI = .92, IFI = .92, NFI = .90 and RMSEA = .08. the validity indices of Normed Fit Index (NFI), Incremental Fit Index (IFI) and the Comparative Fit Index (CFI) are in acceptable range. Moreover, the value of Root Mean Square Error of Approximation (RMSEA) for the model is also in acceptable range.

It is indicated by the Figure 3 that all the items of social media addiction scale have adequate factor loadings. Hence no covariances were included.

DISCUSSION

Significant changes have recently occurred because of the expansion of the internet, specifically about social networking sites and the users of these sites. According to the

Table 1 – Descriptives and frequency distribution of demographics (N = 400)

Demographics	*Min*	*Max*	*M*	*SD*
Age	18	24	20.68	1.67

Demographics	*f*	%	Demographics	*f*	%
Gender			Felt isolated from family & friends		
Male	202	50.5	Rarely	94	23.5
Female	198	49.5	Very rarely	94	23.5
Family system			Sometimes	126	31.5
Nuclear	246	61.5	Often	48	12
Joint	154	38.5	Very often	38	9.5
Education			Disturbed sleep cycle		
BS	367	91.8	Rarely	64	16
MS	33	8.3	Very rarely	55	13.8
Father employment status			Sometimes	151	37.8
Working	315	78.8	Often	70	17.5
Non−working	85	21.3	Very often	60	15
Mother employment status			Apps used on daily basis		
Working	57	14.2	Instagram	94	23.5
Non−working	343	85.8	Snapchat	23	5.8
Time spent on SM			WhatsApp	239	59.8
One hour	42	10.5	Facebook	31	7.8
Few hour	249	62.3	Twitter	13	3.3
All day	74	18.5			
All night	35	8.8			
Skip meals because of SM					
Rarely	122	30.5			
Very rarely	102	25.5			
Sometimes	112	28			
Often	32	8			
Very often	32	8			

Legenda. f = frequency; SM = Social media; BS = Bachelor of science; MS = Master of science.

Table 2 – Descriptive statistics of study variables (N = 400)

Variables	*k*	α	*M*	*SD*	*Skewness*	*Kurtosis*	*Range*	
							Actual	Potential
SMA	6	.641	15.73	4.26	.263	–.125	6–30	6–30
FOMO	10	.728	27.44	6.98	.307	–.001	10–50	10–50
PWB	8	.804	38.68	9.80	–.855	.229	9–56	8–56

Legenda. SMA = Social media addiction; FOMO = Fear of missing out; PWB = Psychological well–being.

Table 3 – Correlation analysis social media addiction, fear of missing out and psychological well–being among young adults (N = 400)

Variables	*1*	*2*	*3*
1. SMA	—		
2. FOMO	.068	—	
3. PWB	.060	.138*	—

Legenda. SMA = Social media addiction; FOMO = Fear of missing out; PWB = Psychological well–being.
* $p<.05$

Table 4 – *t*–test of gender based comparison for social media addiction, fear of missing out and psychological well–being among young adults (N = 400)

	Male (*n* = 202)	*Female* (*n* = 198)			*95% CI*		
Variable	*M* (*SD*)	*M* (*SD*)	*t*	*p*	LL	UL	Cohen's *d*
SMA	15.67(4.03)	15.50(4.30)	.415	.678	.647	.993	.040
FOMO	27.11(6.69)	27.88(7.29)	–1.100	.272	–2.14	.606	.110
PWB	37.51(10.02)	39.64(9.62)	–2.164	.031	–4.05	–.194	.216

Legenda. CI = confidence interval; LL = lower limit; UL = upper limit; SMA = Social media addiction; FOMO = Fear of missing out; PWB = Psychological well–being.

Table 5 – Fit indices of SMA (N = 400)

Scale	χ^2	*df*	CMIN/*df*	IFI	NFI	CFI	RMSEA
Model 1	18	9	35.27	.90	.87	.90	.08

Legenda. df = degree of freedom; IFI = Incremental Fit Index; NFI = Normed Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation.

Note. Model 1: default Model of SMA.

Figure 1 – Figure representing graphical summary of model

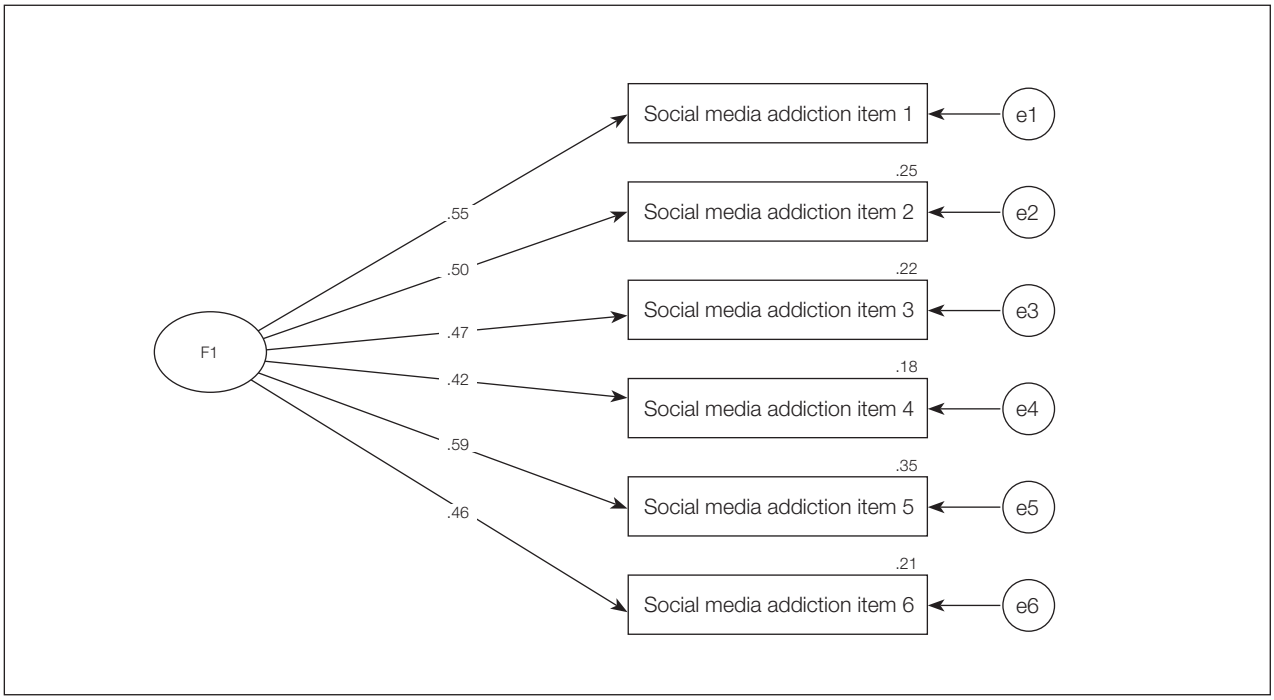


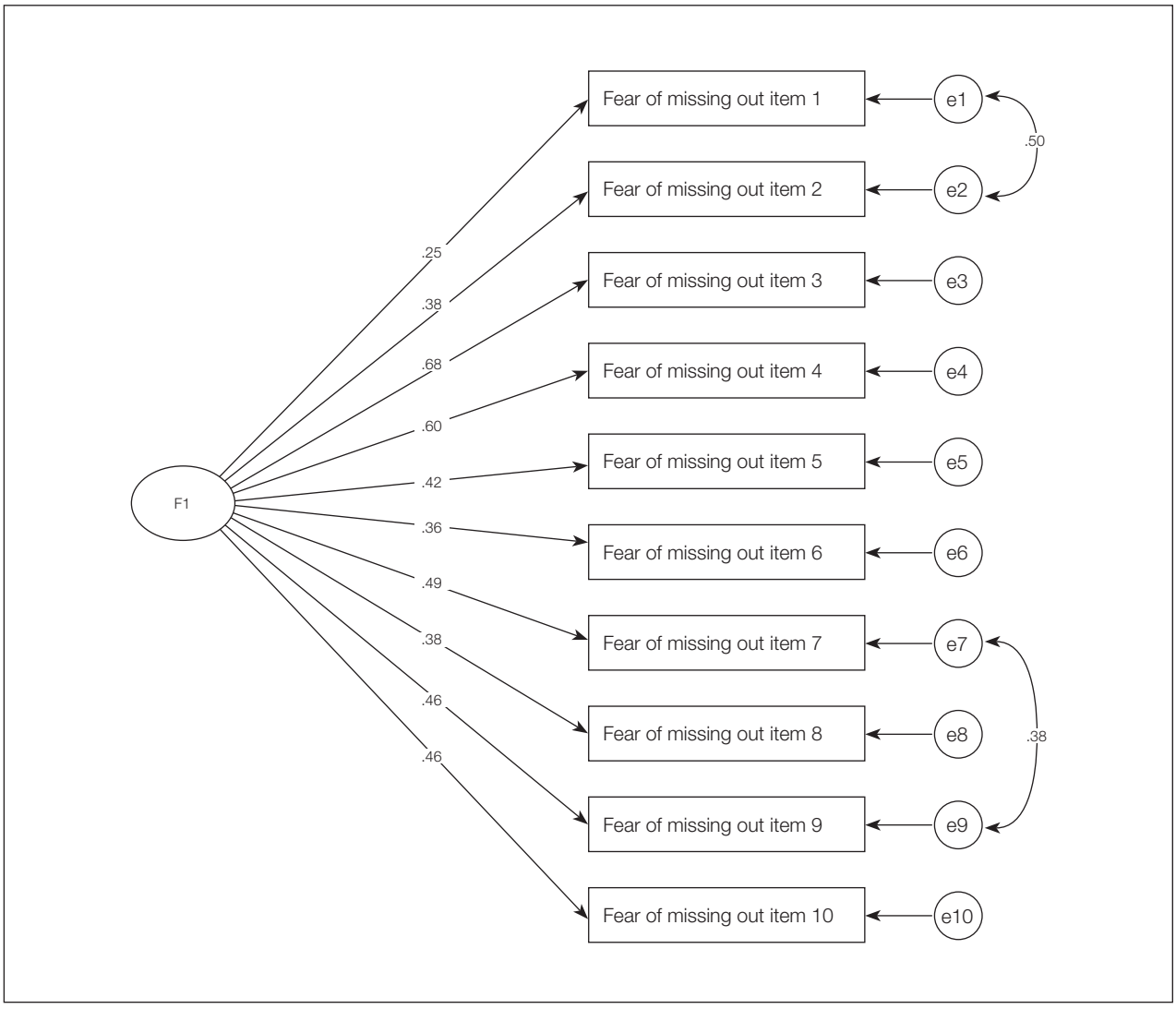
Table 6 – Fit indices of FOMO (N = 400)

Scale	χ^2	*df*	CMIN/*df*	IFI	NFI	CFI	RMSEA
Model 1	30	35	244.67	.69	.65	.68	.12
Model 2	32	33	85.24	.92	.88	.92	.06

Legenda. df = degree of freedom; IFI = Incremental Fit Index; NFI = Normed Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation.

Note. Model 1: default Model of FOMO; Model 2: Model 1 after adding covariances.

Figure 2 – Figure representing graphical summary of model



websites and applications, a wide range of users are now able to communicate globally while also sharing ideas, beliefs, content, feelings, beliefs, social, educational, and personal experiences (Alahmar, 2016). Telegram, Twitter, Instagram, Facebook, WhatsApp, and Skype are among the most used and well–liked virtual social networks (Ebrahimpour et al., 2016; Guedes et al., 2016; Moraitis & Zegeye, 2016; Turner & Lefevre, 2017). This study, which was conducted in recognition of the use and growth of social media, sought to determine the relationship between social media addiction, FOMO, and psychological well–being among young adults as well as gender differences in psychological well–being.

General demographic data was gathered from the participants as well as information on the significance of specific demographic characteristics pertinent to the study. Calculations were made using descriptive measurement for demographic scales and covariates. The findings demonstrated that all variable scores fall between the skewness and kurtosis range, or –2 to +2. Social media addiction, FOMO, and psychological well–being all had alpha reliability values of

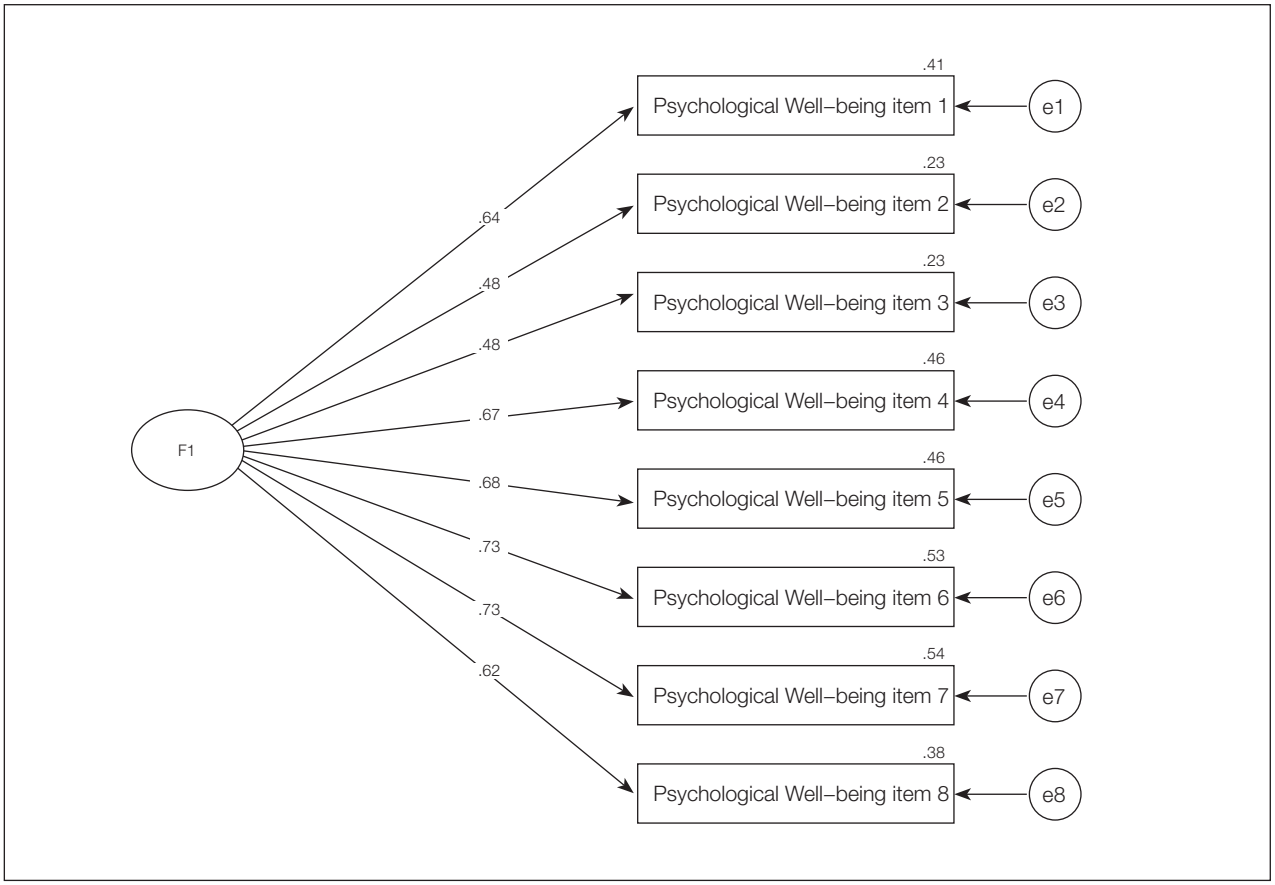
Table 7 – Fit indices of PWB (N = 400)

Scale	χ^2	*df*	CMIN/*df*	IFI	NFI	CFI	RMSEA
Model 1	24	20	96.51	.92	.90	.92	.08

Legenda. df = degree of freedom; IFI = Incremental Fit Index; NFI = Normed Fit Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation.

Note. Model 1: default Model of PWB.

Figure 3 – Figure representing graphical summary of model



.64, .72, and .80, respectively, indicating acceptable ranges for the scales' reliability.

Our findings demonstrated a positive relationship between young adults psychological wellness, social media addiction, and FOMO. It was hypothesised that the three variables – social media addiction, FOMO, and psychological well–being – have a negative association with one another. Our study's results are consistent with previous research suggesting that social networking sites may help boost self–esteem and a sense of belongingness, which may have a positive or indirect effect on psychological well–being thus explaining that more use of social networking sites helps in enhancing psychological well–being. Much of the previous studies shows negative correlations, making our findings unique (Best, Manktelow & Taylor, 2014). The association between the studied variables has been demonstrated to exist in both positive and negative directions in prior studies. Although a significant number of studies have shown a link between social media addiction and psychological health, other studies have shown a favorable relationship between certain of the variables, including, Pang (2018) examined the use of social networking sites among Chinese students living in Germany and discovered that it had good effects on social capital, which was then positively correlated with psychological well–being. In their analysis of data from 266 participants, Bano and colleagues (Bano, Cisheng, Khan & Khan, 2019) showed that WhatsApp use had good impacts on social capital forms and that social capital had favorable effects on psychological well–being, placing particular emphasis on the function of social integration in mediating these positive effects.

Second, contrary to our second hypothesis that fear of missing out would be negatively correlated with young adults' psychological wellness, the results of this study indicate that fear of missing out is highly correlated with young adults' psychological well–being. Our second hypothesis was disproved by these observations (see Table 3). The current study's findings are supported by prior research that examined the relationship between psychological well–being and fear of missing out in young adults. This research found that there is a direct positive relationship between fear of missing out and psychological well–being. Some research suggests a positive relationship between fear of missing out and psychological well–being, while others suggest a negative relationship between online social media weariness and psychological well–being. The findings of a study on compulsive use, FOMO, exhaustion, anxiety, and depression revealed that FOMO had a positive impact on psychological well–being (Dhir, Yossatorn, Kaur & Chen, 2018).

The *t*–test was used to assess gender differences. We predicted that there would be a sizable gender gap in young adults' psychological health. Our idea is supported by the study's findings. According to the current study's findings, there is a statistically significant difference between the psychological well–being of male and female young adults. These findings are consistent with earlier research that looked at the psychological well–being of male and female young adults (Akhter, 2015). In line with this, Shafiq and colleagues (Shafiq, Naz & Yousaf, 2015) found a substantial difference in the psychological well–being of both the male and female groups in their investigation of the gender disparities between assertiveness and psychological well–being among young adults.

Confirmatory factor analysis (CFA)

To confirm the structure of *Social Media Addiction Scale*, *Fear of Missing Out Scale*, and *Psychological Well–Being Scale* on current study's population, CFA was performed. The CFA analysis was conducted to assess the model fit of the measurement model for all scales used in the study. According to the analysis, the only scale that needed to be modified by adding covariances was the fear of missing out. The analysis for *Social Media Addiction Scale* and *Psychological Well–Being Scale* yielded a non–significant chi–square value indicating a good fit to the data. Additionally, the Comparative Fit Index (CFI), Normed Fit Index (NFI), Incremental Fit Index (IFI), the Root Mean Square Error of Approximation (RMSEA), all of which are indicative of a good model fit. These results confirm the validity of the measurement model for the scale used in the study.

CFA for FOMO indicates the initial model fit (Model 1) to be below the desirable bounds for most indices, except for the RMSEA value. However, the validity indices, such as NFI, IFI, and CFI, improved and were within acceptable ranges after adding co–variances to get a better model fit (Model 2). Furthermore, Model 2's RMSEA value was below the suggested cut–off of .06, suggesting a satisfactory fit. These results imply that the updated model more accurately captures the data and validates the reliability of the FOMO scale employed in the investigation.

CONCLUSION

According to current research, social media addiction and FOMO are positively correlated with young adults' psychological well–being. Research has shown that young adults who experience more fear of missing out will have better psychological well–being. This means that young adults who experience more fear of missing out will have better well–being overall.

Limitations and suggestions

Despite how useful these results are, it's vital to remember that the current study has some restrictions. First off, the data lacks diversity because it was only gathered from three institutions of Islamabad, Rawalpindi, and Wah Cantt. As a result, the findings might vary if the data had been gathered from more universities. In the future, data should be gathered from as many regions of the nation as possible to produce outcomes that are rich and varied.

The data collection strategy employed in this investigation was quantitative. Future studies are advised to gather data in a qualitative manner as well to thoroughly explore the study variables. Additionally, the influence of social media addiction and FOMO on future psychological well–being as well as its effects on personal relationships and quality of life can be explored in this research.

Purposive sampling technique was utilized in the current study, but other sampling methods may be used in the future to ensure that the sample is more representative of the population. The study's cross–sectional design, which inhibits the drawing of causal inferences and foretells the evaluation of the directionality of the underlying link, is one of its weaknesses. To address this restriction, an experimental and longitudinal research design should be used to evaluate the causal impacts.

The current study only considers those between the ages of 18 and 24; as a result, it is unable to identify any additional age groups that have access to mobile devices and social media profiles. It is advised that future research determines the prevalence of social media addiction and its impact on various age groups.

Implications of the study

It reveals that depending on demographic parameters social media addiction and the fear of missing out (FOMO) might have a variety of effects on the psychological well–being of young adults in Pakistan. This knowledge is crucial for customizing interventions and assistance programs to meet the specific requirements of various student groups. Second, the findings may help Pakistani educational institutions and politicians understand the possible dangers of excessive social media use, highlighting the significance of encouraging young adults to develop healthy digital habits. Lastly, by providing a more thorough understanding of how these variables interact in the context of higher education in Pakistan, our research adds to the body of knowledge on the intersection of technology, mental health, and demographics.

Funding: No funding was received for the current study. **Conflict of interest:** No conflict of interest. **Data availability:** It is stated that data associated with this research will not be provided due to participant's confidentiality. As it had been ensured to participants that data provided by them will only be used by researchers. **Ethical considerations:** All ethical considerations according to APA have been followed in conduction of this research with this population. **Informed consent:** Participants were informed about the topic and purpose of research. They were asked about their willingness to take part in this research study. It was informed that all the information they will provide will be kept confidential. **Author's contributions:** Ms. Aaisha Shaukat was responsible for conception or design of the work, drafting the work or revising it critically for important intellectual content, agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved, give their final approval of the version to be published. Ms. Maria Muzaffar Janjua was responsible for analysis, or interpretation of data for the work, Shinai Taimur was responsible for the design of the work and acquisition of data. Hadia Safdar was responsible for interpretation of data for the work.

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Witnessing mobbing: Psychological consequences for men and women. A study in Israel

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ABSTRACT. L'obiettivo di questo studio condotto a Eliat (Israele) era quello di analizzare le conseguenze (fisiche ed emotive) e le strategie di coping in uomini e donne testimoni di mobbing. I risultati indicano che le donne sono più propense degli uomini a riferire di aver assistito a comportamenti intrusivi che minano la reputazione di una persona. Le donne inoltre risultano esperire sintomi depressivi più gravi e tendono ad utilizzare, più degli uomini, il supporto emotivo come strategia di coping. Nel complesso questo studio mostra come essere testimoni di mobbing può avere conseguenze psicologiche che influenzano la qualità della vita personale e organizzativa. Per quanto riguarda gli individui, il fenomeno viene percepito in modi e gradi diversi nelle donne e negli uomini.

SUMMARY. The aim of the study presented here was to analyze mobbing from the witnesses' point of view: in particular, to contribute to the understanding of the physical and emotional consequences they may suffer (including malaise with symptoms of depression and anxiety) and their coping strategies. A comparison was made between men and women who have witnessed mobbing. A questionnaire was administered in public administrations, private companies and third sector organizations. The questionnaire was distributed to 262 workers in Eliat (Israel), of whom 78.6% responded to all questions. Findings showed that: women are more likely than men to report witnessing intrusive behavior that undermines a person's reputation; the depressive symptoms were more severe in women than in men; women tended more than men to use coping strategies such as confide in friends, colleagues, and relatives and to seek support when they were affected by the phenomenon. This study shows how witnessing mobbing can have psychological consequences that affect the quality of personal and organizational life. As far as individuals are concerned, this can happen in different ways and to different extents in women and men.

Keywords: *Violence in workplace, Sex differences, Coping strategies, Psychosocial risk, Israel*

INTRODUCTION

In the context of the workplace, Leymann (1996) defined mobbing in terms of "psychological terror" (p. 165) at work. It is characterized by hostile and immoral direct and indirect communication that is systematically and mainly directed against one person by one or more individuals. Situations of this kind that take place almost every day and for a long period of time, namely at least six months, fit into the definition. Because of their nature, frequency and duration, they cause significant psychological, psychosomatic, and social suffering, and push the victim into a defenseless position (Saeidipour, Akbari & Alizadeh, 2021). Einarsen and colleagues (Einarsen, Glaasø & Nielsen, 2011) argue that there are close similarities between several forms of perceived abusive behaviors: "in practice, only minor differences exist between the concepts of bullying, harassment, and mobbing" (Einarsen et al., 2011, p. 5; cit. in Yamada, Duffy & Berry, 2018). Accordingly, they endorse a more or less interchangeable use of the terms in referring to "the systematic exhibition of aggressive behavior at work directed towards a subordinate, a coworker, or even a superior, as well as the perception of being systematically exposed to such mistreatment while at work" (Einarsen et al., 2011, p. 5; cit. in Yamada et al., 2018). What distinguishes mobbing from other conflictual phenomena within a work group is the repetition of harassment and humiliation toward the same person with no effort to hide it. Pasek and colleagues (2020) argue that mobbing initially manifests itself through a simple lack of respect, such as tasteless jokes, to which untruths and manipulations are added. If the social environment does not respond to these behaviors, at a later stage these behaviors transform into overtly perverse conducts, which in most cases affect the mental health of the person against whom they are directed (Aristidou, Mpouzika, Papathanassoglou, Middleton & Karanikola, 2020; Romero, 2022). Leymann (1996) describes these attacks as targeted against communication (e.g., the victim is not left free to express his or her thoughts or is interrupted while speaking), social relationships (e.g., the victim is isolated or ignored), social image (e.g., the victim is ridiculed or gossiped about), professional credit (e.g., the victim is assigned tasks that are below or above his or her skill level), and health (e.g., threats of violence, actual aggressions). As a consequence, the victim can suffer from somatoform disorders, which are diseases caused by the persistence of a stressful situation (Acquadro Maran, Zedda & Varetto, 2021; Duffy & Sperry, 2011; Pheko, 2018).

In a work context there will often be others who see, hear, or understand what is going on, beside the mobber(s) and the victim. Previous research has shown that witnessing abusive behaviors in the workplace has a negative impact on work performance (Einarsen, Hoel, Zapf & Cooper, 2020; Einarsen, Raknes & Matthiesen, 1994; Siyal, Saeed, Pahi, Solangi & Xin, 2021). This has been known for a long time and well documented by investigations. For example, in a British survey, 73% of 761 respondents reported having witnessed mobbing; these individuals also reported higher levels of stress. In addition, 44% of participants were concerned about being bullied themselves, while about one in five said they had considered leaving their workplace (Salin & Notelaers, 2020). In another study conducted with British workers, it was found that 32% of the participants who had witnessed incidents of bullying said that this led to a decrease in efficiency in their workplace, while 28% said that it badly affected their motivation to work (Hoel & Cooper, 2000). This is consistent with Vartia's (2001) study of Finnish municipal workers, where witnesses on the average showed more stress reactions than the other workers. Other effects include dissatisfaction with the job and a more frequent intention to turnover (Acquadro Maran et al., 2021); decreased trust in the organisation (Yanginlar & Bal, 2021); decreased commitment to the job and the organisation itself (da Silva João & Saldanha Portelada, 2019; Divincová & Siváková, 2014). In their turn, these effects can lead the organization to lose reputation by weakening its competitive power (Akar, Anafarta & Sarvan, 2011; Haq, Raja, Alam, De Clercq & Saleem, 2022). The combination of these negative effects affects not only workers and organisations, but also society as a whole, causing significant health and legal expenditures (Azemović & Azemović, 2019).

Men and women witness of mobbing

Men and women appear to differ as to the respective psychological relationships with violence, whether inflicted, suffered, or witnessed (Spencer, Stith & Cafferky, 2022). This could depend, at least to some extent, on differences in how the two sexes perceive some of the issues involved, e.g. what violence is, what counts as an actual instance of violence, how to judge the extent and gravity of a violent act, how to assess the role of the context within which the act has occurred, how to judge its underlying motives, the extent to which the loss of

face associated to being a victim may be acceptable, and so on (Einarsen & Mikkelsen, 2002). The researchers themselves are probably unable to provide extremely detailed instructions about these issues to the participants. As a result, a question such as, for example, "Have you inflicted/suffered/witnessed acts of violence at work?" might be interpreted differently by the average male and female respondents. In each specific incident of mobbing, of course, other, non-sex-related issues will also interact in different ways with such variability: e.g. the identity, age, social class, education, personal features and previous experience of each of the three or four types of characters involved (the perpetrator, the victim, the witness and, possibly, the researchers), the individual statuses in the context, other features of the incident like the events immediately surrounding it, the presence of one or more witnesses etc. It is correspondingly difficult to achieve a general, abstract understanding of the variables involved. However, there is a good deal of relevant research on the topic. Salin (2021) argues that the men's ability to recognize psychological violence is generally lower than that of women. A possible interpretation is that men might be less aware or more tolerant than women of this form of violence when they are the victims, and therefore might notice it less than women or judge it to be less serious also when witnessing it. Men might also perceive physical violence and threats as less severe when inflicted by a woman than when inflicted by another man (see for example Misawa, Andrews & Jenkins, 2019). There might also exist a sex difference in the very perception of violence. Women appear to be more inclined to label negative incidents as mobbing and to classify them as serious; they also appear to feel more affected by them (Alfano, Ramaci, Landolfi, Lo Presti & Barattucci, 2021; Escartín, Zapf, Arrieta & Rodríguez-Carballeira, 2011). Women and men also appear to interpret and respond to mobbing differently. Acquadro Maran and colleagues (2021) studied a sample of 249 witnesses of mobbing (134 women), finding that, overall, women were more likely than men to self-report health-related psychological problems and work-related stress as consequences of such experience.

Witnesses of abusive behaviors may suffer from depression (Borg, Rabinak & Marusak, 2021) and anxiety (Ng, Niven & Notelaers, 2022) in the aftermath of the experience. In previous investigation (see Nonnis, Cuccu & Porcu, 2020), trait anxiety has also been cited as a possible antecedent for self-classification as a mobbing victim or aggressor. Moreover, and it has been hypothesised that the more severe the trait anxiety, the more likely the person is to also experience an increase in anxiety in stressful situations (Milne, Lomax & Freeston, 2019). People with high levels of trait anxiety seem to interpret a broader range of situations as dangerous or threatening (Guil, Gómez-Molinero, Merchan-Clavellino, Gil-Olarte & Zayas, 2019). People with higher trait anxiety are also more likely to suffer a greater increase of state anxiety in situations that involve interpersonal relationships or may threaten self-esteem (Galletta, Confuorto, Improta & Marcelli, 2019; Molero Jurado et al., 2021). On the other hand, Miner-Rubino and Cortina (2007) found that both men and women responded with lower psychological well-being, poorer physical health, and lower job satisfaction after witnessing incivility at work. Sex also appears to differ in their coping strategies. For example, men tend to seek less emotional support than women, who do so from family, friends, and colleagues (Acquadro Maran, Varetto, Butt & Civilotti, 2019; Lewis & Orford, 2005).

Coping strategies in mobbing

Coping is defined as the cognitive, emotional, and behavioural efforts made to tolerate, reduce, or control conflicts between internal and external demands (Folkman, & Lazarus, 1980; Nielsen, Mikkelsen, Persson & Einarsen, 2020). If the strategies chosen are functional, the stress experienced is significantly reduced. According to Lazarus and Folkman (1984, see also Vukelić, Ćizmic & Petrović, 2019), after being exposed to violence, employees first make a primary assessment of the danger and threat of the situation and then proceed with a secondary assessment of resources to counter the event and avoid threats and losses until they choose a response that they implement. If the chosen resources are not sufficient, the subject experiences a strong tension that generates negative emotions and psychological discomfort.

Vukelić et al. (2019) in their study in Serbia, in which 329 employees (69% women) participated, highlighted that experiencing mobbing leads to facing subsequent stressful events with poorly functioning coping strategies, and that this also affects the level of anxiety of the victims themselves. Previously, Reknes et al. (2016) conducted a longitudinal study to investigate whether nurses who were victims of mobbing exhibited more maladpative coping strategies (e.g., avoiding the bully, taking sick leave; see Acquadro Maran

et al. 2019, 2021) in the face of stressful events than non-victims and to determine whether coping style moderates the relationship between mobbing and anxiety. Data was collected from 1582 Norwegian nurses. The results indeed showed that victims tended to cope more negatively with stressful events than non-victims and that coping strategies influenced the victims' next level of anxiety. Grzesiuk and colleagues (Grzesiuk, Szymańska, Jastrzębska & Rutkowska, 2022) examined the relationships between mobbing symptoms, reactions and coping strategies of victims in a sample of 781 Polish employees (66% women, 34% men). The results show that victims exhibit behaviours that are described in the literature as both maladaptive and adaptive (trying to talk to the bully; see Acquadro Maran et al., 2019, 2021), with the latter being used less frequently. The same result can also be observed among witnesses of bullying. Sims and Sun's (2012) study of 150 employees in China found that witnessing workplace bullying was associated with the use of maladaptive strategies, such as the intention to leave the workplace. In general, compared to men, women report using most coping strategies more frequently and focusing more on their feelings (Finstad et al., 2019). In the meta-analysis by Tamres and colleagues (Tamres, Janicki & Helgeson, 2002), women were found to use adaptive coping strategies, especially emotional support, significantly more often than men.

Current study

The Israeli Ministry of Economy and Industry published a study entitled "Harassment and abuse in the workplace" (Fefferman & Bar-Tsuri, 2016) which provided the first official data on the extent of mobbing and its characteristics in the country. The research was based on a representative sample of 1120 workers who answered to telephone interviews conducted over the course of two months in 2012. Fefferman and Bar-Tsuri (2016) inferred from the results that about half of the employees in Israel (1,464 million) had been affected by mobbing in the workplace during 2011. 50.8% of the respondents confirmed that mobbing compromised their motivation to work (51.6%), and that this had negative consequences on the quality of their life (48.2%). In addition, 43.9% of participants agreed with the statement that mobbing is a serious problem in the organization of work.

The purpose of the study we present here was to analyze mobbing from the witnesses' viewpoint: specifically, to contribute to the understanding of the physical and emotional consequences that they may suffer (including malaise, with symptoms of depression and anxiety) and of their coping strategies. A comparison between men and women was made. Based on the literature reviewed, the hypotheses were as follows:

1) women who have witnessed certain negative behaviors tend to classify them as mobbing more frequently and/or more strongly than men;
2) women who have witnessed mobbing tend to experience more severe physical and emotional consequences than men. We hypothesize that this difference is reflected in a greater perception of symptoms of anxiety and malaise;
3) women who have witnessed mobbing tend to seek more emotional support and, more generally, to use more adaptive coping strategies than men.

METHOD

Participants

The sample included 206 respondents, of whom 63.1% were women and 36.9% men. The age of the respondents ranged from 20 to 67 years, with an average of 40.49 (SD = 13.11). The majority of respondents, 51%, were in a relationship, 34% were single, 12.6% were separated/divorced, and 2.4% were widowed or widowers. The majority of respondents had a college degree (49.5%), 44.7% had a high-school diploma, and 5.8% had a primary school degree (5.8%). 38.8% of respondents were public sector employees, 31.1% were private sector employees, and 30.1% were third sector employees. Most respondents worked in organizations with more than 200 employees (82%), while other company sizes were less represented: companies with less than 15 employees made up 4.4% of the sample, organizations with 16 to 50 employees made up 1%, and those with 51 to 100 employees made up 5.3%. Work experience ranged from 6 months to 54 years (M = 19.19 years, SD = 12.31). The majority of the sample had a permanent contract (78.6%), while 15% had an open-ended contract. The remaining portion of the sample reported a project contract. 37.4% had an operational role, 29.6% had a managerial role, 27.7% had a coordinating role, and 5.3% had a technical role within the work organization.

Measures

Participants were asked to anonymously answer a self-administered questionnaire. The first part of it described its purpose and included the instructions for filling it out (with the contact information of the authors of this paper for any doubts or problems), as well as the informed consent form and the statement of anonymity and privacy. The second part contained three scales to evaluate the participant's perception of mobbing in the organization where they worked and their self-perceived mental health and work-related stress. A Hebrew translation of the Val.Mob. scale (Aiello, Deitinger, Nardella & Bonafede, 2008) was used to assess the risk of mobbing in an organization. The scale was originally developed for an Italian audience and comprises 48 items rated on a Likert-type, agreement scale (response options ranged from 1 = totally disagree to 5 = totally agree). The scale contains four subscales:

- Relationship: assesses the level of verbal violence as well as the relationships between the workers and between them and the supervisor(s) (for example, "Impression of one or more colleagues are rejected by gestures or unfriendly attitudes") (in this study, Cronbach's alpha = .95).
- Intrusiveness: assesses the level of interference in private life, excessive control, and physical and/or psychological violence (e.g., "Sometimes one or more colleagues are ridiculed because of their appearance") (Cronbach's alpha = .79).
- Disqualification: evaluates the prevalence of cases of isolation (including exclusion and/or marginalization), transfer, and dequalification (e.g., "Frequently, one or more colleagues are assigned to tasks for which they are over- or underqualified") (Cronbach's alpha = .90).
- Commitment: assesses the level of commitment, involvement in work, and emotional climate (including recognition of results, professional growth, affectivity, and motivation) (e.g., "I would not trade this job for anything else") (Cronbach's alpha = .78).

The original version of the scale was developed to study mobbing from the viewpoint of the victims. Therefore, for this study, the items of the Relationship, Intrusiveness, and Disqualification subscales were reworded in the third person: for example, the item "Sometimes I have to endure mild physical violence" was rephrased as "Sometimes one or more of my colleagues have to endure mild physical violence". In addition, the Val.Mob. allows to assess the degree of stress (low, mild, moderate, or high) in relation to the different subscales.

To assess anxiety, we used the *State-Trait Anxiety Inventory* (*STAI*; Spielberger & Vagg, 1995), which includes a total of 40 items divided into two scales of 20 items each:

1. The *STAI scale – Y1 – State anxiety*. State anxiety is defined as a momentary or situational emotional response to an event (Vîslă, Zinbarg, Hilpert, Allemand & Flückiger, 2021). The scale comprises 20 statements that evaluate the respondent's feelings while completing the inventory. The scale can be used to assess not only how people feel "here and now" but also how they felt at a particular time in the recent past and how they predict they would feel in a particular future situation or in a variety of hypothetical situations. The Y1 scale has been shown to be a sensitive indicator of changes in how people feel about anxiety (Rossi & Pourtois, 2012).
2. The *STAI scale – Y2 – Trait anxiety*. Trait anxiety describes how the respondent normally feels in typical situations in their daily life. More specifically, it evaluates the predisposition to anxiety, i.e., one's tendency to perceive a stressful situation as dangerous or threatening and to respond to it with a temporary increase of the intensity of one's anxiety state. The scale consists of 20 statements assessing the respondent's general state of mind.

Each subinventory includes 20 items that are rated on a Likert-type scale. For the Y1 scale, the response options to statements like "I feel calm; I feel secure" are 1 = not at all; 2 = a little; 3 = sufficiently; 4 = very much; and for the items on the Y2 scale, e.g. "I worry too much over something that really doesn't matter", 1= almost never; 2 = sometimes; 3 = often; 4 = almost always. The possible scores for each scale therefore range from 20 to 80, where higher scores correspond to higher levels of (state or trait) anxiety. The average score of 39-40 represents a threshold for a clinically significant situation (Spielberger & Vagg, 1995). In the original version, internal consistency coefficients for the scale ranged from .86 to .95; test-retest reliability coefficients ranged from .65 to .75 over a 2-month interval (Spielberger, 1983). In this study, Cronbach's alpha was .97 and .93, respectively.

A Hebrew translation of the *Brief COPE* (Carver, 1997) was used to assess the respondent's disposition toward different coping styles and strategies, which may be more or less adaptive, that people typically use to deal with stressful situations. The test comprises 28 items arranged on 14

subscales, each representing a way to cope with stressful situations. The subscales explore the following strategies:

- *active coping*: the propensity to take operational actions and develop strategies to improve the situation (in the original scale by Carver, Cronbach's alpha = .68; in this study, Cronbach's alpha = .64);
- *planning*: the preparedness to look for the most appropriate strategies to resolve the situation (in the original scale by Carver, Cronbach's alpha = .73; in this study, Cronbach's alpha = .66);
- *instrumental support*: the tendency to rely on help or advice from others in difficult situations (in the original scale by Carver, Cronbach's alpha = .64; in this study, Cronbach's alpha = .87);
- *emotional support*: the tendency to seek emotional support from others (in the original scale by Carver, Cronbach's alpha = .71; in this study, Cronbach's alpha = .83);
- *positive reframing*: the ability to reanalyze an event from a more positive perspective (in the original scale by Carver, Cronbach's alpha = .64; in this study, Cronbach's alpha = .70);
- *acceptance*: the ability to accept the situation and live with the difficulties (in the original scale by Carver, Cronbach's alpha = .57; in this study, Cronbach's alpha = .72);
- *denial*: the tendency to deny what happened (in the original scale by Carver, Cronbach's alpha = .54; in this study, Cronbach's alpha = .65);
- *religion*: the tendency to invoke one's religious convictions, e.g. in the form of prayers (in the original scale by Carver, Cronbach's alpha = .82; in this study, Cronbach's alpha = .81);
- *humor*: the attitude of viewing and downplaying a specific event through a humorous lens (in the original scale by Carver, Cronbach's alpha = .73; in this study, Cronbach's alpha = .80);
- *venting*: the ability to externalize one's feelings (in the original scale by Carver, Cronbach's alpha = .50; in this study, Cronbach's alpha = .61);
- *behavioral disengagement*: the tendency to abandon attempts to cope with the situation (in the original scale by Carver, Cronbach's alpha = .65; in this study, Cronbach's alpha = .64);
- *substance use*: the tendency to use alcohol or drugs to mentally escape the situation (in the original scale by Carver, Cronbach's alpha = .90; in this study, Cronbach's alpha = .97);
- *self-blame*: the tendency to blame oneself for a particular event (in the original scale by Carver, Cronbach's alpha = .69; in this study, Cronbach's alpha = .62) (Carver, 1997; Carver, Scheier & Weintraub, 1989).

Each subscale includes 2 items, each rated on a 4-point, Likert-type scale, with response options ranging from 1 = has never happened to me to 4 = has happened to me very often.

The *Beck Depression Inventory* (*BDI*) is a self-administered questionnaire. The BDI-II (Beck, Steer & Brown, 1996) is a version of the original instrument (Beck, Ward, Mendelson, Mock & Erbaugh, 1961) whose items reflect the DSM-IV criteria for major depression. It contains 21 items that aim to capture the characteristics, symptoms, and attitudes that reflect the intensity and severity of each specific symptom, and thus to assess the overall seriousness of depression and the underlying psychological processes. In Beck's theory the "negative cognitive triad", that is the negative beliefs that people may hold about themselves, their present, and their future, has a major impact on the development and severity of depression. The triad also has significant social implications because dissatisfaction with one's social interactions may be expressed and interpreted in its light (Bringmann, Lemmens, Huibers, Borsboom & Tuerlinckx, 2015). Each of the 21 items offers four possible answers, ranging from 0 = no symptom to 3 = severe symptoms. The general scores are arranged on a continuum, where a higher score indicates more severity. The severity of symptoms is interpreted as minimal (0-13), mild (14-19), moderate (20-28), and severe (29-63) (Beck et al., 1996). In the original study, Cronbach's alpha was .91. In this study, Cronbach's alpha was .93.

The third part of the questionnaire collected socio-personal data. In the last part of the questionnaire, mobbing was described using Ege's (2010) definition: "an act (or series of acts) repeated over a long period of time by one or more mobbers to hurt someone systematically and with a specific goal" (see also Cornoiu & Gyorgy, 2013, p. 711). Participants were then asked to indicate whether they had ever witnessed episodes of mobbing in their organization (yes/no response) and whether they considered themselves victims or mobbers (yes/no response). Given the aim of this study, the inclusion criterion was to be a witness. The exclusion criterion was to be a victim or a mobber. Only questionnaires in which the subjects stated that they had witnessed bullying were considered.

Procedure

A letter explaining the aims of the research and providing full details on data protection and anonymity was sent to several Israeli public administration bodies, private companies, and third-sector organizations (for example non-profit or charitable organizations). The criteria for the inclusion of participants were that they were of legal age (18 years and older), witnesses of mobbing and not retired. The exclusion criteria were that they were not employed, victims of mobber, under 18 years of age or retired. A meeting was held with those who agreed to participate to better explain the purpose of the survey and the process. After formal publicity within the organizations, a copy of the questionnaire was distributed to all employees, with additional copies for those who were absent due to illness or vacation. A box was left near the vending machines or in the locker rooms with a request that the questionnaire be returned there within 15 working days. Data were collected between November 2017 and March 2018, i.e. before the pandemic. The survey conformed to the ethical provisions of the 1995 Declaration of Helsinki (revised at the Edinburgh meeting in 2000; World Medical Association, 2001). The research adhered to further ethical standards, including those prescribed by the Israeli Professional Code of Ethics for Psychologists, the Israeli Psychologists Law, which overseees research conducted by psychologists in Israel, the Bioethics Committee of the University of Turin, and the Code of Ethics for Psychologists, which governs the research practices of Italian psychologists. No personally identifying data was gathered. Because there was no medical treatment or other procedures that could cause biological, psychological, or social harm to the participants, no additional ethical approval was required. Participation was voluntary and unrewarded.

The questionnaires were administered in Hebrew. The Brief COPE was translated into Hebrew from the English version, and the Val.Mob. was translated from the Italian version by two translators. The quality of the translation was ensured in two steps. The first was back translation, i.e. a third person reworked the text from the translation to the original version. The second was to test the translation with a control group of fifteen people to evaluate the clarity, cultural appropriateness, and flow of the items. The only problem that emerged was discussed and resolved with the help of this group. Specifically, a change was made in the Val.Mob. value scale: since the answer "neither agree nor disagree" was unclear as a value for the control group, it was decided to translate it in Hebrew as "חוטב אל": an English equivalent is "I am not sure" which the group found to convey a meaning more similar to the Italian version.

The survey was conducted mainly in the greater Eilat area in Israel by distributing questionnaires to government agencies, third sector organisations (e.g. non-profit or charitable organisations) and private companies. The pencil and paper questionnaire was distributed to 262 employees, 78.6% of whom completed all items. Due to the exclusion criterion, 56 people were excluded because they claimed to be victims of bullying. The sample consists of 206 Israeli employees (63.1% women, 36.9% men).

Data analysis strategy

We adopted a dimensional and a categorical approach to data analysis. In the former, we specified a multiple regression model, in which the total score of each scale was regressed on the background variables; in the latter, we specified a logistic regression model, in which the score on each scale was dichotomized according to a cut-off for severity. The cut-offs for the STAI-Y1 and Y2 are the following: from 40 to 50 for mild, 50 to 60 for moderate, and >60 for severe anxiety. The cut-offs for the BDI-II are the following: minimal (scores 0-13), mild (14-19), moderate (20-28), and severe depression (>29). These models allowed us to explore sex differences in the response variables while keeping all other predictors constant. Given the large number of coefficients to be estimated, we controlled the inflation of Type I errors due to multiple tests using the Benjamini-Hochberg method for each group of coefficients. In other words, we controlled for false discovery rate all the regression coefficients of a specific predictor (e.g., sex) across all response variables.

Correlations were calculated to examine the relations between coping strategies and anxiety and depressive symptoms and perception of mobbing in men and women.

RESULTS

The complete results are reported in Appendix A and in Appendix B. For sake of simplicity, we mention here only the significant effects of sex in Cohen's *d* (dimensional approach) or odds ratio (OR) metric (categorical approach).

When taken as absolute values, *d* values indicate a negligible effect when smaller than .20, a small effect between .20 and .50, a moderate effect between .50 and .80, and a large effect when greater than .80 (Cohen, 1988). Using the equations of Borenstein and colleagues (Borenstein, Hedges, Higgins & Rothstein, 2009), we computed the equivalent values for ORs, which were 1.44, 2.48, and 4.27, respectively.

Dimensional approach

The response variables were the scores on the Brief COPE (BC), the STAY-Y1, the STAY-Y2, the BDI, and the Val.Mob. total score and subscale scores (Relationship, Intrusiveness, Disqualification, and Committment). Predictors were age, sex (focal category: female; reference category: male), relationship status (dummy variables for in a relationship and divorced; reference category: other), educational level (focal category: less than college degree; reference category: college degree), type of organization (dummy variables for private and third-sector; reference category: public), total years of working, years of working in the current organization, organizational role (dummy variables for managerial and operational; reference category: other) (see Appendix A).

Women reported significantly higher mean scores than men on several Brief COPE scales (denial: $d = .51$ [.19, .83]; emotional support: $d = .92$ [.58, 1.26]; instrumental support: $d = .89$ [.55, 1.24]; venting: $d = .96$ [.62, 1.31]; positive reframing: $d = .72$ [.39, 1.05]; acceptance: $d = .38$ [.07, .70]; and religion: $d = .57$ [.25, .89]). Women also scored higher on the BDI ($d = .60$ [.28, .93]), while they reported significantly lower scores on the Brief COPE scale substance use ($d = .57$ [.24, .89]).

Categorical approach

The response variables were the scores on the STAY-Y1, the STAY-Y2, the BDI, and the Val.Mob. total score and subscale scores (Relationship, Intrusiveness, Disqualification, and Committment). Predictors were age, sex (focal category: female; reference category: male), relationship status (dummy variables for in a relationship and divorced; reference category: other), educational level (focal category: less than college degree; reference category: college degree), type of organization (dummy variables for private and third-sector; reference category: public), total years of working, years of working in the current organization, organizational role (dummy variables for managerial and operational; reference category: other) (see Appendix B).

Women reported a significantly higher probability than men of scoring above the threshold of the severity cut-off on the BDI (OR = 7.05 [1.90, 26.15]) and on the Val.Mob. Intrusiveness scale (OR = 3.79 [1.52, 9.42]).

Correlation

We computed the correlations of the coping scores with those of Val.Mob. and STAI-Y1 and Y2 scales and BDI and we compared for men and women (see Appendix C and Appendix D). The only differences were found in the correlation of BC_venting with Val.Mob._symptomatology (men $r = -.16$, women $r = .45$, $p = .011$, $d = .62$ [.32, .92]) and BC_acceptance and trait anxiety (men $r = -.17$, women $r = .42$, $p = .015$, $d = .58$ [.29, .88]).

DISCUSSION

The purpose of this study was to examine how men and women that have witnessed mobbing may differ in their respective perceptions of the event and psychological aftermaths, which are often characterized by malaise, in the form of anxiety and/or depression and more or less effective attempts to cope with the situation. A sample of 206 Israeli workers (63.1% women, 36.9% men) participated in the study. The results showed that women are more likely than men to report witnessing intrusive behavior that undermines a person's reputation. We hypothesized that women who witnessed certain negative behaviors would classify them as bullying more often and/or more strongly than men did, so Hypothesis 1 was only partially supported. However, there is more to the data than just this consideration. An intrusive behavior at work may consist, for example, in an invasion of privacy, excessive control, and physical or psychological violence. The invasion of privacy is the most personal, with consequences that can be more devastating because they affect more aspects of the worker's life than just the professional one. As for overcontrol, in the Job Demand Control Model theory (Karasek, 1979, 1989; Karasek & Theorell, 1990) it brings about higher feelings of stress and, as discussed by Finstad

and colleagues (2019), lead to forms of workplace violence, including mobbing. Overcontrol inhibits a worker's autonomy, i.e., his or her ability to participate in decision-making, while increasing depersonalization and alienation from work (De Vries, 2001; Mastracci & Adams, 2018). Excessive monitoring practices aim to reinforce the notion that the workers are inadequate, giving them the impression that they are at constant risk of failure, which undermines their self-confidence and professional image (Annakis, Lobo & Pillay, 2011; Bugdol & Nagody-Mrozowicz, 2020). Intrusiveness thus is a transversal element in organizational life since not only those who are affected by mobbing, but also those who live in the same context suffer its consequences in different ways, either directly as a victim or indirectly as a witness.

The second hypothesis concerned the possibly different consequences that witnessing mobbing may have on men and women. Overall, the correlation shows that men are less likely to use venting as a coping strategy than women with increased symptoms in Val.Mob. scale. More in details, the results showed that only the depressive symptoms were more severe in women than in men; thus, the hypothesis was partially supported. Again, this is interesting because the literature (e.g., Acquadro Maran et al., 2021) suggests that female witnesses of bullying are more likely to suffer from sudden anxiety than depression. Since the results of this study suggest a lack of consistency with previous research, it would be interesting to better explore the discourse, perhaps with more targeted scales, with interviews, that is, with qualitative data. Women were also more likely than men to suffer from major depressive symptoms: depression is more common in women than in men in the general population too (see Niedhammer, Coindre, Memmi, Bertrais & Chastang, 2020), and the presence of violent behavior in the workplace increases the risk of depressive symptoms (see Boudrias, Trépanier & Salin, 2021; Mento et al., 2020; Rudkjoebing et al., 2020). In addition, as suggested by Rasool and colleagues (Rasool, Maqbool, Samma, Zhao & Anjum, 2019), a negative work environment can induce or exacerbate depressive symptoms in the presence of stigma or of a perception of discrimination by supervisors and colleagues. Fear of displaying symptoms, and thus the inability to ask for help, can lead to worsening mental health (Burns & Green, 2019; Krakauer, Stelnicki & Carleton, 2020; Shann, Martin, Chester & Ruddock, 2019).

The third hypothesis was that women witnesses of mobbing would be more likely than men to seek emotional support and, in general, to use adaptive coping strategies. The results partially confirmed this hypothesis too. Women actually tended more than men to use coping strategies such as confide in friends, colleagues, and relatives and to seek support when they were affected by the phenomenon. They also used more instrumental support, namely venting, positive reframing, acceptance (as also shown by the results of the correlation analysis), and religion, which are considered adaptive strategies (see Dores, Martins, Reis & Carvalho, 2021; Meyer, 2001). At the same time, however, they also tended to use denial more than men, which, given the importance and complexity of this strategy, is noteworthy. Denial is a type of defence mechanism in which the reality of a situation is ignored to avoid anxiety. It can consist in not acknowledging reality or its consequences (Cramer, 2006), and it often means that the worker is struggling to accept something that would otherwise be stressful or overwhelming. In the short term, denial may grant the worker time to adjust to a sudden change in reality; yet this may become a problem if it keeps the worker from addressing a problem or making a needed change. Sometimes it can even prevent the person from accepting help or getting the care they need. Women witnesses of mobbing also were less likely than men to use a substance use strategy. This should bring attention to men who, in the same circumstances, are at risk of using strategies that are considered maladaptive. Maladaptive coping strategies are not only unhelpful in cases of mobbing, like other phenomena, but can also have direct negative effects on psychological well-being, such as withdrawal and social isolation (Enns, Eldridge, Montgomery & Gonzalez, 2018).

This study confirmed the negative consequences that mobbing can have on witnesses. This provides yet another reason to prevent mobbing, in order to maintain the physical and mental health and well-being of all the workers: the victims, who obviously should not be such, as well as the witnesses and the perpetrators themselves. The literature offers several tools for prevention, such as training, monitoring the quality of life in the organization, implementing measures for stress management, e.g. in Bakker and Demerouti's (2007) job demands and resources model, reducing the demands or increasing the organizational resources available to the worker. Recently, Ervasti and colleagues (2022) devised an intervention strategy that includes online and offline meetings with workers and supervisors. At the organizational level, their proposal aims to improve the prevention of mobbing by initiating reflection on the relevant procedures and

instructions. As regards the relationship with supervisors, the objective is to raise awareness of the phenomenon, provide guidance on how to deal with it, and improve the climate within the team. At the work unit level, the goal is to address the aspects of work that aggravate the likelihood of mobbing, identify potentially difficult and risky situations, and suggest further ways to improve the group climate. This allows to express negative feelings, seek help from colleagues, and eliminate the stigma associated with mental health problems. This strategy is desirable in all organizations to prevent mobbing, which can have a negative impact both on the workers and on the entire organization (e.g., due to the worsening of the internal climate or the damage to the organization's image).

Limitations

This study has several limitations. First, being a cross-sectional research, the results should be taken with caution and not generalized. We examined gender differences, but other socio-demographic variables, such as the participant's role in the organization, were not considered. For example, the level of responsibility in a work groups may affect how a suspected case of bullying is assessed or what coping strategies are more likely to be adopted (Bjorklund et al., 2019). We also did not investigate how the participants responded to the mobbing behavior they witnessed. For example, being a bystander or a whistleblower might lead to different coping strategies with different levels of perceived stress and different psychological consequences. The victim's response may also influence the witnesses' reaction and the possible aftermaths of the event. For example, whether the victim reacts with a request for support from colleagues *vs* a tendency to self-isolate from them may affect not only their further propensity to intervene but also their perception of what has actually happened. Further research could investigate the reaction of witnesses to incidents in which the victim is confronted with different types of mobbing behavior, perhaps using the method of vignette (which has already been used to investigate the phenomenon of bullying at school; see Demol, Verschueren, Jame, Lazard & Colpin, 2021). It might also be useful to study mobbing from several perspectives or dimensions (subjects and groups; the victim, the bully, and the witnesses), as well as in terms of the relations between the abusive behavior and the victim's and the witnesses' reaction. This could help to better understand the phenomenon and its dynamics. Interviews could be used to explore the actual experiences and the possible alternatives that each person involved might have been able to implement in the specific context.

Yet another limitation is related to time. We did not ask how long it had been since the events investigated. The time lapsed and the dynamics of the aftermath could probably partly explain the symptoms, the memories, and the experiences recounted by the participants. In post-traumatic stress disorder, for example, the original event is relived in all its vividness, with flashbacks, intrusive memories, and so on (Aristidou et al., 2020; Zhou, Marchand & Guay, 2017), while in other conditions memories tend to change and fade over time. This could help better understand the symptoms associated with witnessing mobbing. Further research could then include a scale to capture symptoms associated with PTSD and examine the time factor to understand whether the symptoms persist or change over time and whether they have aspects of chronicity.

Another aspect that we did not study is the possible changes occurred during the Covid-19 period. While the survey was carried out before the lockdowns occurred, it might be useful to conduct a longitudinal follow-up to determine whether the prolonged lack of direct contact in several workplaces and the rules applied to the workers have modified the occurrence, nature, features, and aftermaths of violence at work (or at school). Of course, the fact that many activities had been partly or wholly transferred online or had undergone other transformations in their material practices cannot but have had an impact on the manifestations of violence. Furthermore, many workers were affected in specific ways because of their individual health or mental conditions; others because of their personal beliefs about the situation and how to deal with it or of the measures imposed (e.g., social distancing, vaccination, sanctions for the dissidents, etc.). Mobbing at work may have been worsened by social/organisational norms that victims did not adhere to or by higher levels of stress at work and outside the workplace, or it may have been mitigated due to the radical impoverishment of relationships or to the atmosphere of general depression which reigned all over the population, or, even more likely, a mix of factors might have changed the landscape in more complex ways. Analogously, the sort of very ambiguous return to normality that is currently underway, should be investigated as well. Periodic surveys of a working

population could therefore help understand the evolution of the phenomenon. Interviews about this could also be useful.

Finally, this survey contains an unavoidable participation bias. Voluntary participation may have attracted individuals who were sensitive to the issue or who responded for reasons of social desirability (MacCurtain, Murphy, O'Sullivan, MacMahon & Turner, 2018). Future studies could include social desirability scales.

CONCLUSIONS

This study shows how witnessing mobbing can affect the physical and emotional consequences (including malaise with symptoms of depression and anxiety) and coping strategies of women and men in Israel. As far as the individuals are concerned, this may happen in different ways and to different extents in women and men. It is necessary to better understand the dynamics of mobbing by investigating the experiences, behaviors, and strategies of both the victims and the witnesses, and in general of all those who are faced with such situations. We hope that the results of the study and the reflections contained here can contribute to finding tools to analyze the phenomenon from different angles.

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APPENDIX A

Details of the results of the multiple regression models for metric response variables ("dimensional approach")

In these models, the response variables were the scores on the Brief COPE (BC), the STAY-Y1, the STAY-Y2, the BDI, and the Val.Mob. total score and subscale scores (Relationship, Intrusiveness, Disqualification, and Commitment). Predictors were age, sex (focal category: female; reference category: male), relationship status (dummy variables for in a relationship and divorced; reference category: other), educational level (focal category: less than college degree; reference category: college degree), type of organization (dummy variables for private and third-sector; reference category: public), total years of working, years of working in the current organization, organizational role (dummy variables for managerial and operational; reference category: other). Table A reports the complete results of the multiple regression analysis.

Table A – Results of the multiple regression analyses

Response variable	Predictor	Estimate	SE	*t*(160)	*p*	adj-*p*	*d*
BC–Self–distraction	(Intercept)	7.086	1.074	6.597	<.001	<.001	1.04 [.71, 1.37]
	Age	–.093	.047	–1.981	.049	.249	–.31 [–.62, .00]
	Female	.284	.328	.865	.388	.518	.14 [–.17, .45]
	In a relationship	–.207	.376	–.550	.583	.862	–.09 [–.40, .22]
	Divorced	–.274	.497	–.551	.582	.813	–.09 [–.40, .22]
	No college degree	.684	.352	1.944	.054	.147	.31 [.00, .62]
	Private organization	–.946	.415	–2.279	.024	.086	–.36 [–.67, –.05]
	Third–sector organization	–.069	.443	–.156	.876	.918	–.02 [–.33, .29]
	Total years of working	.120	.048	2.495	.014	.100	.39 [.08, .71]
	Years of working in the current organization	–.029	.024	–1.232	.220	.690	–.19 [–.51, .12]
	Managerial role	–.323	.386	–.836	.404	.556	–.13 [–.44, .18]
	Operational role	.631	.347	1.820	.071	.194	.29 [–.02, .60]
BC–Active coping	(Intercept)	7.769	.711	10.923	<.001	<.001	1.73 [1.36, 2.09]
	Age	–.010	.031	–.315	.753	.789	–.05 [–.36, .26]
	Female	–.245	.217	–1.129	.261	.410	–.18 [–.49, .13]
	In a relationship	.208	.249	.833	.406	.862	.13 [–.18, .44]
	Divorced	.385	.329	1.170	.244	.761	.18 [–.13, .50]

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Response variable	Predictor	Estimate	SE	*t*(160)	*p*	adj-*p*	*d*
	No college degree	−.344	.233	−1.477	.142	.241	−.23 [−.54, .08]
	Private organization	−.376	.275	−1.370	.173	.265	−.22 [−.53, .09]
	Third−sector organization	.098	.293	.336	.737	.918	.05 [−.26, .36]
	Total years of working	.006	.032	.177	.860	.946	.03 [−.28, .34]
	Years of working in the current organization	−.001	.016	−.094	.926	.998	−.01 [−.32, .30]
	Managerial role	.234	.256	.915	.362	.556	.14 [−.17, .45]
	Operational role	−.568	.229	−2.473	.014	.079	−.39 [−.70, −.08]
BC−Denial	(Intercept)	3.440	1.016	3.386	.001	.001	.54 [.22, .85]
	Age	−.036	.045	−.811	.418	.708	−.13 [−.44, .18]
	Female	**1.007**	**.310**	**3.250**	**.001**	**.004**	**.51 [.19, .83]**
	In a relationship	.122	.356	.343	.732	.862	.05 [−.26, .36]
	Divorced	.310	.470	.659	.511	.813	.10 [−.21, .41]
	No college degree	**1.254**	**.333**	**3.769**	**<.001**	**.005**	**.60 [.28, .91]**
	Private organization	−.543	.392	−1.383	.169	.265	−.22 [−.53, .09]
	Third−sector organization	−.213	.419	−.510	.611	.918	−.08 [−.39, .23]
	Total years of working	.041	.046	.895	.372	.568	.14 [−.17, .45]
	Years of working in the current organization	.001	.022	.059	.953	.998	.01 [−.30, .32]
	Managerial role	−.253	.366	−.693	.489	.633	−.11 [−.42, .20]
	Operational role	−.197	.328	−.600	.550	.636	−.09 [−.40, .22]
BC−Substance use	(Intercept)	3.182	.614	5.183	<.001	<.001	.82 [.50, 1.14]
	Age	−.034	.027	−1.264	.208	.509	−.20 [−.51, .11]
	Female	**−.671**	**.187**	**−3.580**	**<.001**	**.001**	**−.57 [−.89, −.24]**
	In a relationship	−.055	.215	−.255	.799	.862	−.04 [−.35, .27]
	Divorced	−.030	.284	−.107	.915	.996	−.02 [−.33, .29]
	No college degree	.169	.201	.842	.401	.509	.13 [−.18, .44]

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Response variable	Predictor	Estimate	SE	*t*(160)	*p*	adj-*p*	*d*
	Private organization	.437	.237	1.840	.068	.149	.29 [−.02, .60]
	Third−sector organization	.438	.253	1.731	.085	.439	.27 [−.04, .58]
	Total years of working	.025	.028	.911	.364	.568	.14 [−.17, .45]
	Years of working in the current organization	.000	.014	−.002	.998	.998	.00 [−.31, .31]
	Managerial role	.008	.221	.037	.970	.970	.01 [−.30, .32]
	Operational role	.541	.198	2.729	.007	.078	.43 [.12, .74]
BC−Emotional support	(Intercept)	5.421	.932	5.816	<.001	<.001	.92 [.59, 1.24]
	Age	−.072	.041	−1.767	.079	.249	−.28 [−.59, .03]
	Female	**1.652**	**.284**	**5.812**	**<.001**	**<.001**	**.92 [.58, 1.26]**
	In a relationship	.909	.327	2.782	.006	.067	.44 [.13, .75]
	Divorced	.932	.431	2.160	.032	.355	.34 [.03, .65]
	No college degree	−.632	.305	−2.071	.040	.146	−.33 [−.64, −.02]
	Private organization	−.880	.360	−2.445	.016	.086	−.39 [−.70, −.07]
	Third-sector organization	.392	.384	1.020	.309	.709	.16 [−.15, .47]
	Total years of working	.035	.042	.831	.407	.568	.13 [−.18, .44]
	Years of working in the current organization	.029	.021	1.420	.158	.656	.22 [−.09, .53]
	Managerial role	−.621	.335	−1.853	.066	.241	−.29 [−.60, .02]
	Operational role	−.342	.301	−1.136	.258	.346	−.18 [−.49, .13]
BC−Instrumental support	(Intercept)	4.857	.980	4.954	<.001	<.001	.78 [.46, 1.10]
	Age	−.023	.043	−.534	.594	.789	−.08 [−.39, .23]
	Female	**1.692**	**.299**	**5.658**	**<.001**	**<.001**	**.89 [.55, 1.24]**
	In a relationship	.981	.343	2.856	.005	.067	.45 [.14, .76]
	Divorced	1.086	.454	2.393	.018	.355	.38 [.07, .69]
	No college degree	−.328	.321	−1.021	.309	.453	−.16 [−.47, .15]

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Response variable	Predictor	Estimate	SE	*t*(160)	*p*	adj-*p*	*d*
	Private organization	−.834	.379	−2.203	.029	.086	−.35 [−.66, −.04]
	Third-sector organization	.563	.404	1.394	.165	.520	.22 [−.09, .53]
	Total years of working	−.038	.044	−.871	.385	.568	−.14 [−.45, .17]
	Years of working in the current organization	.056	.022	2.610	.010	.210	.41 [.10, .73]
	Managerial role	−.901	.353	−2.554	.012	.076	−.40 [−.72, −.09]
	Operational role	−.657	.316	−2.077	.039	.142	−.33 [−.64, −.02]
BC−Behavioral disengagement	(Intercept)	2.700	.726	3.720	<.001	<.001	.59 [.27, .90]
	Age	−.030	.032	−.951	.343	.631	−.15 [−.46, .16]
	Female	.389	.221	1.758	.081	.165	.28 [−.03, .59]
	In a relationship	−.159	.254	−.625	.533	.862	−.10 [−.41, .21]
	Divorced	−.379	.336	−1.127	.261	.761	−.18 [−.49, .13]
	No college degree	**.744**	**.238**	**3.130**	**.002**	**.023**	**.49 [.18, .81]**
	Private organization	.451	.280	1.610	.109	.219	.25 [−.06, .57]
	Third-sector organization	.282	.299	.942	.348	.709	.15 [−.16, .46]
	Total years of working	.030	.033	.927	.355	.568	.15 [−.16, .46]
	Years of working in the current organization	.014	.016	.845	.400	.889	.13 [−.18, .44]
	Managerial role	−.398	.261	−1.523	.130	.300	−.24 [−.55, .07]
	Operational role	.390	.234	1.664	.098	.205	.26 [−.05, .57]
BC−Venting	(Intercept)	4.021	.859	4.680	<.001	<.001	.74 [.42, 1.06]
	Age	−.026	.038	−.679	.498	.783	−.11 [−.42, .20]
	Female	**1.596**	**.262**	**6.091**	**<.001**	**<.001**	**.96 [.62, 1.31]**
	In a relationship	.222	.301	.739	.461	.862	.12 [−.19, .43]
	Divorced	.455	.398	1.144	.254	.761	.18 [−.13, .49]
	No college degree	−.229	.281	−.814	.417	.509	−.13 [−.44, .18]

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Response variable	Predictor	Estimate	SE	*t*(160)	*p*	adj-*p*	*d*
	Private organization	−.630	.332	−1.897	.060	.146	−.30 [−.61, .01]
	Third-sector organization	.554	.354	1.564	.120	.439	.25 [−.06, .56]
	Total years of working	.031	.039	.812	.418	.568	.13 [−.18, .44]
	Years of working in the current organization	.013	.019	.694	.489	.889	.11 [−.20, .42]
	Managerial role	−.770	.309	−2.491	.014	.076	−.39 [−.71, −.08]
	Operational role	−.323	.277	−1.166	.245	.346	−.18 [−.49, .13]
BC−Positive reframing	(Intercept)	5.387	1.006	5.353	<.001	<.001	.85 [.52, 1.17]
	Age	−.018	.044	−.405	.686	.789	−.06 [−.37, .25]
	Female	**1.399**	**.307**	**4.559**	**<.001**	**<.001**	**.72 [.39, 1.05]**
	In a relationship	.298	.353	.844	.400	.862	.13 [−.18, .44]
	Divorced	.671	.466	1.440	.152	.761	.23 [−.08, .54]
	No college degree	.301	.329	.915	.362	.497	.14 [−.17, .45]
	Private organization	**−1.196**	**.389**	**−3.076**	**.002**	**.027**	**−.49 [−.80, −.17]**
	Third-sector organization	−.670	.415	−1.617	.108	.439	−.26 [−.57, .06]
	Total years of working	.010	.045	.225	.822	.946	.04 [−.27, .35]
	Years of working in the current organization	−.015	.022	−.693	.489	.889	−.11 [−.42, .20]
	Managerial role	.368	.362	1.015	.311	.556	.16 [−.15, .47]
	Operational role	.361	.325	1.113	.267	.346	.18 [−.13, .49]
BC−Planning	(Intercept)	7.458	.715	10.426	<.001	<.001	1.65 [1.29, 2.01]
	Age	−.013	.031	−.415	.679	.789	−.07 [−.38, .24]
	Female	.012	.218	.056	.955	.991	.01 [−.30, .32]
	In a relationship	.060	.251	.241	.810	.862	.04 [−.27, .35]
	Divorced	.005	.331	.016	.987	.996	.00 [−.31, .31]
	No college degree	−.509	.234	−2.175	.031	.137	−.34 [−.66, −.03]

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Response variable	Predictor	Estimate	SE	*t*(160)	*p*	adj-*p*	*d*
	Private organization	−.070	.276	−.254	.800	.800	−.04 [−.35, .27]
	Third-sector organization	.475	.295	1.610	.109	.439	.25 [−.06, .57]
	Total years of working	.017	.032	.536	.593	.724	.08 [−.23, .39]
	Years of working in the current organization	.002	.016	.133	.894	.998	.02 [−.29, .33]
	Managerial role	.141	.257	.549	.584	.713	.09 [−.22, .40]
	Operational role	−.542	.231	−2.349	.020	.088	−.37 [−.68, −.06]
BC−Humor	(Intercept)	4.222	.908	4.652	<.001	<.001	.74 [.41, 1.05]
	Age	−.073	.040	−1.824	.070	.249	−.29 [−.60, .02]
	Female	.003	.277	.011	.991	.991	.00 [−.31, .31]
	In a relationship	−.071	.318	−.224	.823	.862	−.04 [−.35, .27]
	Divorced	.191	.420	.456	.649	.840	.07 [−.24, .38]
	No college degree	.438	.297	1.474	.142	.241	.23 [−.08, .54]
	Private organization	.472	.351	1.345	.180	.265	.21 [−.10, .52]
	Third-sector organization	−.190	.374	−.508	.612	.918	−.08 [−.39, .23]
	Total years of working	.047	.041	1.142	.255	.568	.18 [−.13, .49]
	Years of working in the current organization	.009	.020	.429	.669	.998	.07 [−.24, .38]
	Managerial role	.521	.327	1.595	.113	.300	.25 [−.06, .56]
	Operational role	.396	.293	1.351	.179	.302	.21 [−.10, .52]
BC−Acceptance	(Intercept)	7.588	.991	7.657	<.001	<.001	1.21 [.87, 1.55]
	Age	−.081	.043	−1.860	.065	.249	−.29 [−.61, .02]
	Female	**.734**	**.302**	**2.428**	**.016**	**.040**	**.38 [.07, .70]**
	In a relationship	−.406	.347	−1.170	.244	.837	−.19 [−.50, .13]
	Divorced	−.247	.459	−.538	.591	.813	−.09 [−.39, .23]
	No college degree	−.555	.324	−1.709	.089	.179	−.27 [−.58, .04]
	Private organization	−.834	.383	−2.180	.031	.086	−.34 [−.66, −.03]

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Response variable	Predictor	Estimate	SE	*t*(160)	*p*	adj-*p*	*d*
	Third-sector organization	.454	.408	1.112	.268	.709	.18 [−.13, .49]
	Total years of working	.092	.044	2.069	.040	.168	.33 [.01, .64]
	Years of working in the current organization	−.006	.022	−.290	.772	.998	−.05 [−.36, .26]
	Managerial role	.022	.357	.063	.950	.970	.01 [−.30, .32]
	Operational role	.645	.320	2.018	.045	.142	.32 [.01, .63]
BC−Religion	(Intercept)	2.415	.998	2.420	.017	.017	.38 [.07, .69]
	Age	.001	.044	.013	.989	.989	.00 [−.31, .31]
	Female	**1.099**	**.304**	**3.609**	**<.001**	**.001**	**.57 [.25, .89]**
	In a relationship	.161	.350	.459	.647	.862	.07 [−.24, .38]
	Divorced	.544	.462	1.177	.241	.761	.19 [−.12, .50]
	No college degree	.782	.327	2.392	.018	.132	.38 [.06, .69]
	Private organization	−.543	.386	−1.408	.161	.265	−.22 [−.53, .09]
	Third-sector organization	−.106	.411	−.258	.797	.918	−.04 [−.35, .27]
	Total years of working	.005	.045	.113	.910	.953	02 [−.29, .33]
	Years of working in the current organization	−.001	.022	−.049	.961	.998	−.01 [−.32, .30]
	Managerial role	−.601	.359	−1.673	.096	.300	−.26 [−.58, .05]
	Operational role	−.091	.322	−.283	.778	.815	−.04 [−.35, .27]
BC−Self−blame	(Intercept)	7.058	.671	10.525	<.001	<.001	1.66 [1.30, 2.02]
	Age	−.075	.029	−2.559	.011	.126	−.40 [−.72, −.09]
	Female	−.141	.205	−.691	.491	.568	−.11 [−.42, .20]
	In a relationship	.242	.235	1.031	.304	.837	.16 [−.15, .47]
	Divorced	.179	.310	.578	.564	.813	.09 [−.22, .40]
	No college degree	.135	.220	.615	.539	.624	.10 [−.21, .41]
	Private organization	−.214	.259	−.826	.410	.429	−.13 [−.44, .18]
	Third-sector organization	.000	.276	−.001	.999	.999	.00 [−.31, .30]

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Response variable	Predictor	Estimate	SE	*t*(160)	*p*	adj-*p*	*d*
	Total years of working	**.091**	**.030**	**3.019**	**.003**	**.039**	**.48 [.16, .79]**
	Years of working in the current organization	−.016	.015	−1.063	.290	.796	−.17 [−.48, .14]
	Managerial role	−.221	.241	−.918	.360	.556	−.15 [−.46, .17]
	Operational role	−.355	.216	−1.642	.102	.205	−.26 [−.57, .05]
STAY−Y1	(Intercept)	49.531	2.135	23.198	<.001	<.001	3.67 [3.16, 4.17]
	Age	.097	.094	1.041	.299	.631	.16 [−.15, .47]
	Female	−.304	.651	−.467	.641	.706	−.07 [−.38, .24]
	In a relationship	−.788	.748	−1.053	.294	.837	−.17 [−.48, .14]
	Divorced	−.008	.988	−.008	.994	.996	.00 [−.31, .30]
	No college degree	−1.384	.699	−1.980	.049	.147	−.31 [−.62, .00]
	Private organization	1.958	.825	2.374	.019	.086	.38 [.06, .69]
	Third-sector organization	−.790	.880	−.898	.371	.709	−.14 [−.45, .17]
	Total years of working	−.104	.096	−1.084	.280	.568	−.17 [−.48, .14]
	Years of working in the current organization	.030	.047	.637	.525	.889	.10 [−.21, .41]
	Managerial role	−.678	.768	−.882	.379	.556	−.14 [−.45, .17]
	Operational role	.768	.689	1.115	.266	.346	.18 [−.13, .49]
STAI−Y2	(Intercept)	48.750	2.131	22.878	<.001	<.001	3.62 [3.11, 4.12]
	Age	.198	.093	2.119	.036	.249	.33 [.02, .65]
	Female	−1.121	.650	−1.725	.086	.165	−.27 [−.58, .04]
	In a relationship	−.795	.747	−1.064	.289	.837	−.17 [−.48, .14]
	Divorced	−.799	.986	−.810	.419	.813	−.13 [−.44, .18]
	No college degree	−1.265	.698	−1.813	.072	.158	−.29 [−.60, .03]
	Private organization	.715	.823	.869	.386	.425	.14 [−.17, .45]
	Third-sector organization	.252	.878	.287	.774	.918	.05 [−.26, .36]
	Total years of working	−.193	.096	−2.014	.046	.168	−.32 [−.63, −.01]

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Response variable	Predictor	Estimate	SE	*t*(160)	*p*	adj-*p*	*d*
	Years of working in the current organization	−.008	.047	−.176	.860	.998	−.03 [−.34, .28]
	Managerial role	**2.234**	**.767**	**2.914**	**.004**	**.045**	**.46 [.15, .77]**
	Operational role	1.024	.688	1.489	.138	.254	.24 [−.08, .55]
BDI	(Intercept)	−.227	5.376	−.042	.966	.966	−.01 [−.32, .30]
	Age	.098	.236	.415	.679	.789	.07 [−.24, .38]
	Female	**6.257**	**1.640**	**3.816**	**<.001**	**.001**	**.60 [.28, .93]**
	In a relationship	1.192	1.884	.633	.528	.862	.10 [−.21, .41]
	Divorced	−2.715	2.488	−1.092	.277	.761	−.17 [−.48, .14]
	No college degree	3.201	1.760	1.819	.071	.158	.29 [−.02, .60]
	Private organization	−1.898	2.077	−.914	.362	.419	−.14 [−.45, .17]
	Third-sector organization	−1.923	2.215	−.868	.387	.709	−.14 [−.45, .17]
	Total years of working	.311	.241	1.287	.200	.568	.20 [−.11, .51]
	Years of working in the current organization	−.182	.118	−1.540	.126	.656	−.24 [−.55, .07]
	Managerial role	−2.894	1.934	−1.496	.137	.300	−.24 [−.55, .07]
	Operational role	1.505	1.735	.868	.387	.473	.14 [−.17, .45]
Val.Mob. Relationship	(Intercept)	57.435	10.242	5.608	<.001	<.001	.89 [.56, 1.21]
	Age	−.263	.449	−.586	.559	.789	−.09 [−.40, .22]
	Female	3.152	3.124	1.009	.315	.461	.16 [−.15, .47]
	In a relationship	−.138	3.589	−.038	.969	.969	−.01 [−.32, .30]
	Divorced	−.688	4.739	−.145	.885	.996	−.02 [−.33, .29]
	No college degree	.749	3.353	.223	.824	.832	.04 [−.27, .35]
	Private organization	−4.683	3.957	−1.183	.238	.312	−.19 [−.50, .12]
	Third-sector organization	7.477	4.220	1.772	.078	.439	.28 [−.03, .59]
	Total years of working	.485	.460	1.054	.293	.568	.17 [−.14, .48]
	Years of working in the current organization	−.330	.226	−1.465	.145	.656	−.23 [−.54, .08]

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Response variable	Predictor	Estimate	SE	*t*(160)	*p*	adj-*p*	*d*
	Managerial role	−6.895	3.685	−1.871	.063	.241	−.30 [−.61, .02]
	Operational role	5.439	3.304	1.646	.102	.205	.26 [−.05, .57]
Val.Mob. Intrusiveness	(Intercept)	23.617	2.805	8.421	<.001	<.001	1.33 [.99, 1.67]
	Age	**−.403**	**.123**	**−3.278**	**.001**	**.028**	**−.52 [−.83, −.20]**
	Female	.688	.855	.804	.422	.518	.13 [−.18, .44]
	In a relationship	−1.431	.983	−1.457	.147	.837	−.23 [−.54, .08]
	Divorced	1.313	1.298	1.012	.313	.765	.16 [−.15, .47]
	No college degree	.511	.918	.557	.578	.636	.09 [−.22, .40]
	Private organization	−1.276	1.083	−1.178	.241	.312	−.19 [−.50, .12]
	Third-sector organization	−.465	1.156	−.403	.688	.918	−.06 [−.37, .25]
	Total years of working	**.373**	**.126**	**2.962**	**.004**	**.039**	**.47 [.15, .78]**
	Years of working in the current organization	−.001	.062	−.018	.986	.998	.00 [−.31, .31]
	Managerial role	−1.191	1.009	−1.181	.239	.479	−.19 [−.50, .12]
	Operational role	2.305	.905	2.547	.012	.079	.40 [.09, .72]
Val.Mob. Disqualification	(Intercept)	33.494	5.224	6.412	<.001	<.001	1.01 [.68, 1.34]
	Age	.075	.229	.330	.742	.789	.05 [−.26, .36]
	Female	2.719	1.593	1.707	.090	.165	.27 [−.04, .58]
	In a relationship	.479	1.831	.262	.794	.862	.04 [−.27, .35]
	Divorced	−1.374	2.417	−.569	.570	.813	−.09 [−.40, .22]
	No college degree	.363	1.710	.212	.832	.832	.03 [−.28, .34]
	Private organization	**−7.147**	**2.018**	**−3.542**	**.001**	**.011**	**−.56 [−.88, −.24]**
	Third-sector organization	.444	2.152	.206	.837	.918	.03 [−.28, .34]
	Total years of working	−.006	.234	−.025	.980	.980	.00 [−.31, .31]
	Years of working in the current organization	−.089	.115	−.777	.438	.889	−.12 [−.43, .19]

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Response variable	Predictor	Estimate	SE	*t*(160)	*p*	adj-*p*	*d*
	Managerial role	**−6.275**	**1.880**	**−3.339**	**.001**	**.023**	**−.53 [−.84, −.21]**
	Operational role	.008	1.686	.005	.996	.996	.00 [−.31, .31]
Val.Mob. Commitment	(Intercept)	21.742	2.697	8.063	<.001	<.001	1.27 [.93, 1.61]
	Age	.151	.118	1.276	.204	.509	.20 [−.11, .51]
	Female	.659	.823	.801	.424	.518	.13 [−.18, .44]
	In a relationship	1.137	.945	1.203	.231	.837	.19 [−.12, .50]
	Divorced	−.758	1.248	−.607	.545	.813	−.10 [−.41, .21]
	No college degree	−1.081	.883	−1.225	.222	.350	−.19 [−.50, .12]
	Private organization	−2.265	1.042	−2.174	.031	.086	−.34 [−.66, −.03]
	Third-sector organization	−1.777	1.111	−1.600	.112	.439	−.25 [−.56, .06]
	Total years of working	−.094	.121	−.775	.439	.568	−.12 [−.43, .19]
	Years of working in the current organization	.141	.059	2.368	.019	.210	.37 [.06, .69]
	Managerial role	−.192	.970	−.198	.843	.927	−.03 [−.34, .28]
	Operational role	**−3.257**	**.870**	**−3.743**	**<.001**	**.006**	**−.59 [−.91, −.27]**
Val.Mob. Total	(Intercept)	45.782	8.479	5.399	<.001	<.001	.85 [.53, 1.18]
	Age	−.353	.372	−.949	.344	.631	−.15 [−.46, .16]
	Female	3.457	2.586	1.337	.183	.310	.21 [−.10, .52]
	In a relationship	.979	2.971	.330	.742	.862	.05 [−.26, .36]
	Divorced	−.018	3.923	−.004	.996	.996	.00 [−.31, .31]
	No college degree	6.073	2.776	2.188	.030	.137	.35 [.03, .66]
	Private organization	−3.636	3.276	−1.110	.269	.328	−.18 [−.49, .14]
	Third-sector organization	1.292	3.494	.370	.712	.918	.06 [−.25, .37]
	Total years of working	.813	.381	2.135	.034	.168	.34 [.03, .65]
	Years of working in the current organization	−.252	.187	−1.350	.179	.656	−.21 [−.52, .10]

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Response variable	Predictor	Estimate	SE	*t*(160)	*p*	adj-*p*	*d*
	Managerial role	−1.219	3.051	−.400	.690	.799	−.06 [−.37, .25]
	Operational role	−1.028	2.736	−.376	.708	.778	−.06 [−.37, .25]

Legenda. SE = standard error of the estimate; *p* = *p*-value; adj-*p* = *p*-value adjusted for false discovery rate (FDR); *d* = Cohen's *d* and its 95% confidence interval; BC = Brief COPE; Val.Mob. = Val.Mob. scale; STAY-Y1 = State Anxiety; STAY-Y2 = Trait Anxiety; BDI = *Beck Depression Inventory.*
Note. Significant effects after correction for FDR are bolded for ease of interpretation.

APPENDIX B

Details of the results of the logistic regression models for dichotomous response variables ("categorical approach")

In these models, the response variables were the scores on the STAY-Y1, the STAY-Y2, the BDI, and the Val.Mob. total score and subscale scores (Re-lationship, Intrusiveness, Disqualification, and Commitment). Predictors were age, sex (focal category: female; reference category: male), relationship status (dummy variables for in a relationship and divorced; reference category: other), educational level (focal category: less than college degree; reference category: college degree), type of organization (dummy variables for private and third-sector; reference category: public), total years of working, years of working in the current organization, organizational role (dummy variables for managerial and operational; reference category: other).

Table B shows the complete results of the logistic regression analysis.

Table B – Results of the logistic regression analyses

Response variable	Predictor	Estimate	SE	*z*	*p*	adj–*p*	OR
STAI-Y1	(Intercept)	−.354	1.540	−.230	.818	.842	
	Age	.096	.070	1.370	.171	.405	1.10 [.96, 1.26]
	Female	−.344	.438	−.785	.432	.576	.71 [.30, 1.67]
	In a relationship	−.537	.483	−1.113	.266	.982	.58 [.23, 1.50]
	Divorced	−.468	.647	−.724	.469	.625	.63 [.18, 2.22]
	No college degree	−1.143	.504	−2.266	.023	.188	.32 [.12, .86]
	Private organization	.859	.576	1.491	.136	.272	2.36 [.76, 7.30]
	Third–sector organization	−.336	.560	−.599	.549	.732	.71 [.24, 2.14]
	Total years of working	−.100	.070	−1.417	.157	.418	.91 [.79, 1.04]
	Years of working in the current organization	.025	.032	.783	.434	.602	1.03 [.96, 1.09]
	Managerial role	−.394	.490	−.805	.421	.561	.67 [.26, 1.76]
	Operational role	.416	.465	.896	.370	.592	1.52 [.61, 3.77]
STAI-Y2	(Intercept)	−.363	1.821	−.199	.842	.842	
	Age	.118	.083	1.416	.157	.405	1.12 [.96, 1.32]
	Female	−.973	.576	−1.690	.091	.182	.38 [.12, 1.17]
	In a relationship	−.102	.571	−.178	.859	.984	.90 [.29, 2.77]
	Divorced	−.825	.717	−1.150	.250	.622	.44 [.11, 1.79]

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Response variable	Predictor	Estimate	SE	*z*	*p*	adj–*p*	OR
	No college degree	−.260	.520	−.501	.616	.704	.77 [.28, 2.13]
	Private organization	−.014	.678	−.021	.984	.984	.99 [.26, 3.73]
	Third–sector organization	−.049	.713	−.068	.946	.946	.95 [.24, 3.85]
	Total years of working	−.099	.084	−1.183	.237	.447	.91 [.77, 1.07]
	Years of working in the current organization	−.034	.036	−.946	.344	.602	.97 [.90, 1.04]
	Managerial role	1.025	.630	1.627	.104	.276	2.79 [.81, 9.58]
	Operational role	.209	.486	.431	.666	.865	1.23 [.48, 3.19]
BDI	(Intercept)	−2.873	1.680	−1.711	.087	.349	
	Age	−.005	.074	−.072	.942	.942	.99 [.86, 1.15]
	Female	**1.953**	**.669**	**2.919**	**.004**	**.017**	**7.05 [1.90, 26.15]**
	In a relationship	−.011	.556	−.020	.984	.984	.99 [.33, 2.94]
	Divorced	−.745	.766	−.973	.330	.622	.47 [.11, 2.13]
	No college degree	.643	.543	1.186	.236	.629	1.90 [.66, 5.51]
	Private organization	**−2.005**	**.767**	**−2.615**	**.009**	**.036**	**.13 [.03, .61]**
	Third–sector organization	−1.085	.682	−1.590	.112	.255	.34 [.09, 1.29]
	Total years of working	.077	.074	1.033	.302	.447	1.08 [.93, 1.25]
	Years of working in the current organization	−.065	.040	−1.610	.107	.393	.94 [.87, 1.01]
	Managerial role	−.719	.648	−1.109	.267	.428	.49 [.14, 1.74]
	Operational role	1.149	.550	2.088	.037	.098	3.15 [1.07, 9.27]
Severity Val.Mob. Relationship	(Intercept)	−.383	1.772	−.216	.829	.842	
	Age	−.101	.079	−1.275	.202	.405	.90 [.77, 1.06]
	Female	.790	.530	1.490	.136	.218	2.20 [.78, 6.23]
	In a relationship	−.020	.529	−.038	.970	.984	.98 [.35, 2.76]
	Divorced	−.972	.799	−1.217	.224	.622	.38 [.08, 1.81]
	No college degree	−.394	.525	−.751	.453	.679	.67 [.24, 1.89]

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Response variable	Predictor	Estimate	SE	*z*	*p*	adj–*p*	OR
	Private organization	−.181	.732	−.247	.805	.920	.83 [.20, 3.50]
	Third−sector organization	1.080	.709	1.525	.127	.255	2.95 [.73, 11.81]
	Total years of working	.123	.080	1.537	.124	.418	1.13 [.97, 1.32]
	Years of working in the current organization	−.011	.038	−.295	.768	.768	.99 [.92, 1.07]
	Managerial role	−.899	.608	−1.480	.139	.278	.41 [.12, 1.34]
	Operational role	1.265	.545	2.321	.020	.081	3.54 [1.22, 10.31]
Severity Val.Mob. Intrusiveness	(Intercept)	3.180	1.430	2.224	.026	.209	
	Age	−.092	.062	−1.476	.140	.405	.91 [.81, 1.03]
	Female	**1.332**	**.465**	**2.864**	**.004**	**.017**	**3.79 [1.52, 9.42]**
	In a relationship	−1.280	.519	−2.466	.014	.109	.28 [.10, .77]
	Divorced	−1.116	.698	−1.599	.110	.622	.33 [.08, 1.29]
	No college degree	.406	.468	.868	.385	.679	1.50 [.60, 3.76]
	Private organization	**−2.137**	**.625**	**−3.420**	**.001**	**.005**	**.12 [.03, .40]**
	Third−sector organization	−1.514	.618	−2.450	.014	.114	.22 [.07, .74]
	Total years of working	.119	.063	1.881	.060	.418	1.13 [1.00, 1.27]
	Years of working in the current organization	−.022	.032	−.695	.487	.602	.98 [.92, 1.04]
	Managerial role	−.923	.490	−1.885	.059	.238	.40 [.15, 1.04]
	Operational role	.695	.456	1.523	.128	.256	2.00 [.82, 4.90]
Severity Val.Mob. Disqualification	(Intercept)	.687	1.756	.391	.696	.842	
	Age	.033	.079	.423	.672	.896	1.03 [.89, 1.21]
	Female	−.223	.493	−.452	.651	.651	.80 [.30, 2.10]
	In a relationship	.143	.579	.247	.805	.984	1.15 [.37, 3.59]
	Divorced	−.099	.789	−.125	.900	.900	.91 [.19, 4.26]
	No college degree	−.071	.574	−.124	.901	.901	.93 [.30, 2.87]
	Private organization	−.924	.763	−1.211	.226	.361	.40 [.09, 1.77]

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Response variable	Predictor	Estimate	SE	*z*	*p*	adj–*p*	OR
	Third–sector organization	−1.182	.760	−1.555	.120	.255	.31 [.07, 1.36]
	Total years of working	.032	.083	.393	.695	.794	1.03 [.88, 1.21]
	Years of working in the current organization	.033	.052	.633	.527	.602	1.03 [.93, 1.15]
	Managerial role	−.317	.628	−.505	.614	.614	.73 [.21, 2.49]
	Operational role	**−1.443**	**.517**	**−2.791**	**.005**	**.042**	**.24 [.09, .65]**
Severity Val.Mob. Commitment	(Intercept)	−2.100	1.501	−1.399	.162	.431	
	Age	−.013	.066	−.199	.843	.942	.99 [.87, 1.12]
	Female	.774	.453	1.711	.087	.182	2.17 [.89, 5.27]
	In a relationship	.244	.484	.504	.614	.984	1.28 [.49, 3.29]
	Divorced	−.356	.667	−.534	.594	.678	.70 [.19, 2.59]
	No college degree	.748	.497	1.507	.132	.527	2.11 [.80, 5.59]
	Private organization	−.409	.584	−.701	.483	.644	.66 [.21, 2.09]
	Third–sector organization	.173	.577	.300	.764	.873	1.19 [.38, 3.68]
	Total years of working	.065	.067	.963	.335	.447	1.07 [.94, 1.22]
	Years of working in the current organization	−.064	.035	−1.837	.066	.393	.94 [.88, 1.00]
	Managerial role	.290	.506	.574	.566	.614	1.34 [.50, 3.60]
	Operational role	.080	.469	.170	.865	.865	1.08 [.43, 2.72]
Severity Val.Mob. Total	(Intercept)	−1.086	1.604	−.677	.499	.842	
	Age	−.032	.071	−.446	.656	.896	.97 [.4, 1.11]
	Female	.373	.587	.636	.525	.599	1.45 [.46, 4.59]
	In a relationship	.545	.606	.900	.368	.982	1.72 [.53, 5.65]
	Divorced	.673	.782	.862	.389	.622	1.96 [.42, 9.08]
	No college degree	.368	.557	.660	.509	.679	1.44 [.48, 4.31]
	Private organization	−1.441	.786	−1.833	.067	.178	.24 [.05, 1.10]

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Response variable	Predictor	Estimate	SE	*z*	*p*	adj–*p*	OR
	Third–sector organization	.827	.704	1.174	.240	.385	2.29 [.57, 9.09]
	Total years of working	−.009	.074	−.122	.903	.903	.99 [.86, 1.15]
	Years of working in the current organization	.057	.039	1.448	.148	.393	1.06 [.98, 1.14]
	Managerial role	−1.255	.661	−1.899	.058	.238	.29 [.08, 1.04]
	Operational role	.119	.547	.218	.827	.865	1.13 [.39, 3.29]

Legenda. SE = standard error of the estimate; *z* = *z*-statistic; *p* = *p*-value; adj-*p* = *p*-value adjusted for false discovery rate (FDR); OR = odds ratio and its 95% confidence interval.
Note. Significant effects after correction for FDR are bolded for ease of interpretation.

APPENDIX C

Table C – Correlation matrix for psychological variables in males (*n* = 66, lower triangle) and females (*n* = 106, upper triangle)

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. BC-Self-distraction		–.17	**.40**	**.22**	.18	.05	**.25**	.16	.13	–.13	.08	.10	**.30**	**.23**	**.23**	**.27**	.01	**–.25**	.17	.03	–.16	.17
2. BC-Active coping	**–.28**		**–.52**	**–.22**	**.39**	**.32**	**–.71**	**.20**	–.09	**.74**	**–.46**	.11	**–.20**	**.29**	.07	–.19	.10	**.42**	.09	**–.46**	.10	–.18
3. BC-Denial	**.36**	**–.38**		.07	–.02	–.01	**.47**	.08	.00	**–.46**	**.22**	–.18	**.43**	.07	**.24**	**.26**	**.24**	**–.43**	**.21**	.17	**–.24**	**.24**
4. BC-Substance use	**.44**	**–.46**	**.26**		**–.20**	–.11	**.26**	–.11	.06	**–.23**	.18	.12	.08	–.05	.09	**.35**	.04	–.19	.04	–.01	–.17	.02
5. BC-Emotional support	.15	.23	.06	**–.31**		**.85**	**–.19**	**.53**	**.24**	**.44**	–.10	.13	**.27**	**.38**	.10	.03	.06	.02	.13	**–.23**	–.09	–.14
6. BC-Instrumental support	.02	**.28**	–.08	**–.40**	**.73**		–.15	**.52**	**.22**	**.41**	.01	.12	**.36**	**.33**	.10	.05	.06	–.05	.10	**–.19**	–.13	**–.20**
7. BC-Behavioral disengagement	.22	**–.76**	**.47**	**.29**	–.13	**–.29**		–.17	.01	**–.60**	**.42**	–.11	**.30**	–.02	–.09	.16	–.04	**–.45**	.05	**.44**	–.15	**.22**
8. BC-Venting	**.24**	–.10	**.39**	–.02	**.58**	**.56**	.14		.09	**.37**	–.10	.14	**.26**	**.27**	**.34**	.15	**.33**	.00	**.45**	–.18	–.09	.17
9. BC-Positive reframing	**.38**	–.07	.11	–.03	**.42**	**.42**	.03	**.43**		.01	**.39**	**.55**	.19	–.06	**–.31**	.07	**–.26**	.02	**–.39**	.13	**.22**	**–.41**
10. BC-Planning	–.23	**.67**	**–.27**	**–.53**	**.29**	**.39**	**–.54**	–.02	–.13		**–.29**	.16	–.18	**.40**	.10	–.04	.09	**.41**	.16	**–.45**	.01	–.16
11. BC-Humor	.11	**–.37**	.09	**.24**	.07	–.03	**.31**	.14	**.45**	**–.41**		.12	.18	–.02	**–.34**	**.25**	**–.31**	**–.43**	**–.35**	**.25**	.09	**–.31**
12. BC-Acceptance	**.26**	–.02	–.15	–.11	**.46**	**.33**	–.06	**.29**	**.60**	.04	**.27**		–.04	–.02	**–.24**	–.01	**–.25**	**.28**	**–.25**	.04	**.42**	**–.29**
13. BC-Religion	**.35**	**–.39**	**.26**	**.29**	.00	.05	**.32**	.14	**.36**	**–.32**	**.25**	.19		.16	.08	**.19**	.03	**–.23**	.12	.12	–.12	.07
14. BC-Self-blame	–.17	.09	.11	**–.28**	.17	**.28**	–.03	**.28**	**–.27**	**.35**	**–.40**	–.14	–.20		.13	.07	.16	.00	**.35**	**–.20**	**–.31**	**.28**
15. Val.Mob.-Relationship	**.32**	.07	.20	**.35**	–.10	–.19	.07	–.11	–.18	.03	**–.34**	–.12	–.06	–.06		**.41**	**.80**	**–.25**	**.74**	**–.29**	**–.29**	**.58**
16. Val.Mob.-Intrusiveness	**.30**	–.08	.19	**.53**	.14	.04	–.06	.19	.04	–.11	.05	.07	.07	–.01	**.46**		**.21**	**–.42**	**.25**	.02	–.36	.12
17. Val.Mob.-Disqualification	**.31**	.04	.21	.22	–.01	.00	–.01	.05	–.07	.08	**–.36**	.05	–.02	.12	**.77**	**.35**		–.11	**.68**	**–.23**	**–.34**	**.58**
18. Val.Mob.-Commitment	**–.29**	**.48**	–.23	**–.51**	.23	**.39**	**–.40**	.05	.13	**.42**	–.17	.17	–.07	.16	**–.30**	**–.36**	.01		–.12	**–.28**	.09	–.03
19. Val.Mob.-Total Score	.05	.03	**.29**	.16	–.17	–.21	.04	–.16	**–.34**	.14	**–.40**	–.21	.02	**.36**	**.49**	.22	**.46**	.00		**–.28**	**–.42**	**.75**
20. STAI-Y1	–.11	**–.42**	–.03	.01	.02	.13	.21	.17	.12	–.19	.16	.10	.02	–.04	**–.26**	–.10	**–.31**	**–.35**	–.22		**.24**	–.01
21. STAI-Y2	**–.27**	.11	–.22	–.14	–.14	–.07	–.13	–.24	–.04	.04	.15	–.17	–.02	**–.36**	**–.33**	–.23	**–.30**	.04	**–.45**	.12		**–.42**
22. BDI	.00	–.08	**.32**	.18	**–.27**	**–.26**	.11	–.05	**–.38**	–.02	**–.42**	**–.29**	–.03	**.37**	**.44**	.18	**.49**	–.06	**.77**	–.14	**–.45**	

Legenda. BC = Brief COPE; Val.Mob. = Val.Mob. scale; STAY-Y1 = State Anxiety; STAY-Y2 = Trait Anxiety; BDI = *Beck Depression Inventory*.
Note. Bolded coefficients are significant at $p<.05$.

APPENDIX D

Table D – Results of the comparisons of correlation coefficients

Variable 1	Variable 2	*r* Males (*n* = 66)	*r* Females (*n* = 166)	*z*	*p*	adj–*p*	*d*
BC-Self-distraction	BC-Active coping	–.28	–.17	–.67	.505	.952	.10 [–.20, .40]
BC-Self-distraction	BC-Denial	.36	.40	–.30	.768	.952	.05 [–.25, .34]
BC-Self-distraction	BC-Substance use	.44	.22	1.59	.113	.684	.24 [–.06, .54]
BC-Self-distraction	BC-Emotional support	.15	.18	–.19	.849	.952	.03 [–.27, .33]
BC-Self-distraction	BC-Instrumental support	.02	.05	–.21	.834	.952	.03 [–.27, .33]
BC-Self-distraction	BC-Behavioral disengagement	.22	.25	–.21	.836	.952	.03 [–.27, .33]
BC-Self-distraction	BC-Venting	.24	.16	.56	.573	.952	.09 [–.21, .38]
BC-Self-distraction	BC-Positive reframing	.38	.13	1.70	.090	.610	.26 [–.04, .56]
BC-Self-distraction	BC-Planning	–.23	–.13	–.65	.513	.952	.10 [–.20, .40]
BC-Self-distraction	BC-Humor	.11	.08	.17	.862	.952	.03 [–.27, .33]
BC-Self-distraction	BC-Acceptance	.26	.10	1.01	.314	.929	.15 [–.15, .45]
BC-Self-distraction	BC-Religion	.35	.30	.35	.728	.952	.05 [–.25, .35]
BC-Self-distraction	BC-Self-blame	–.17	.23	–2.51	.012	.353	.38 [.08, .68]
BC-Self-distraction	Val.Mob.-Relationship	–.11	.03	–.92	.359	.952	.14 [–.16, .44]
BC-Self-distraction	Val.Mob.-Intrusiveness	–.27	–.16	–.75	.456	.952	.11 [–.19, .41]
BC-Self-distraction	Val.Mob.-Disqualification	.32	.23	.56	.574	.952	.09 [–.21, .38]
BC-Self-distraction	Val.Mob.-Commitment	.30	.27	.19	.848	.952	.03 [–.27, .33]
BC-Self-distraction	STAI-Y1	.31	.01	1.93	.054	.482	.29 [–.01, .59]
BC-Self-distraction	STAI-Y2	–.29	–.25	–.31	.758	.952	.05 [–.25, .35]
BC-Self-distraction	Val.Mob.-Total Score	.05	.17	–.75	.453	.952	.11 [–.18, .41]
BC-Self-distraction	BDI	.00	.17	–1.09	.278	.904	.17 [–.13, .46]

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Variable 1	Variable 2	*r* Males (*n* = 66)	*r* Females (*n* = 166)	*z*	*p*	adj–*p*	*d*
BC-Active coping	BC-Denial	−.38	−.52	1.10	.271	.904	.17 [−.13, .47]
BC-Active coping	BC-Substance use	−.46	−.22	−1.71	.087	.610	.26 [−.04, .56]
BC-Active coping	BC-Emotional support	.23	.39	−1.10	.270	.904	.17 [−.13, .47]
BC-Active coping	BC-Instrumental support	.28	.32	−.30	.761	.952	.05 [−.25, .35]
BC-Active coping	BC-Behavioral disengagement	−.76	−.71	−.74	.460	.952	.11 [−.19, .41]
BC-Active coping	BC-Venting	−.10	.20	−1.93	.054	.482	.29 [.00, .59]
BC-Active coping	BC-Positive reframing	−.07	−.09	.15	.881	.952	.02 [−.28, .32]
BC-Active coping	BC-Planning	.67	.74	−.83	.407	.952	.13 [−.17, .43]
BC-Active coping	BC-Humor	−.37	−.46	.66	.507	.952	.10 [−.20, .40]
BC-Active coping	BC-Acceptance	−.02	.11	−.80	.426	.952	.12 [−.18, .42]
BC-Active coping	BC-Religion	−.39	−.20	−1.31	.190	.788	.20 [−.10, .50]
BC-Active coping	BC-Self-blame	.09	.29	−1.29	.198	.788	.20 [−.10, .50]
BC-Active coping	Val.Mob.-Relationship	−.42	−.46	.37	.713	.952	.06 [−.24, .36]
BC-Active coping	Val.Mob.-Intrusiveness	.11	.10	.08	.936	.974	.01 [−.29, .31]
BC-Active coping	Val.Mob.-Disqualification	.07	.07	.01	.989	.998	.00 [−.30, .30]
BC-Active coping	Val.Mob.-Commitment	−.08	−.19	.71	.478	.952	.11 [−.19, .41]
BC-Active coping	STAI-Y1	.04	.10	−.37	.711	.952	.06 [−.24, .36]
BC-Active coping	STAI-Y2	.48	.42	.40	.687	.952	.06 [−.24, .36]
BC-Active coping	Val.Mob.-Total Score	.03	.09	−.35	.724	.952	.05 [−.24, .35]
BC-Active coping	BDI	−.08	−.18	.62	.536	.952	.09 [−.20, .39]
BC-Denial	BC-Substance use	.26	.07	1.25	.211	.788	.19 [−.11, .49]
BC-Denial	BC-Emotional support	.06	−.02	.52	.601	.952	.08 [−.22, .38]
BC-Denial	BC-Instrumental support	−.08	−.01	−.43	.670	.952	.07 [−.23, .36]

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Variable 1	Variable 2	*r* Males (*n* = 66)	*r* Females (*n* = 166)	*z*	*p*	adj–*p*	*d*
BC-Emotional support	Val.Mob.-Disqualification	−.10	.10	−1.28	.201	.788	.19 [−.10, . 49]
BC-Emotional support	Val.Mob.-Commitment	.14	.03	.72	.469	.952	.11 [−.19, .41]
BC-Emotional support	STAI-Y1	−.01	.06	−.39	.696	.952	.06 [−.24, .36]
BC-Emotional support	STAI-Y2	.23	.02	1.33	.182	.788	.20 [−.10, .50]
BC-Emotional support	Val.Mob.-Total Score	−.17	.13	−1.95	.051	.482	.30 [.00, .60]
BC-Emotional support	BDI	−.27	−.14	−.85	.394	.952	.13 [−.17, .43]
BC-Instrumental support	BC-Behavioral disengagement	−.29	−.15	−.89	.371	.952	.14 [−.16, .44]
BC-Instrumental support	BC-Venting	.56	.52	.38	.704	.952	.06 [−.24, .36]
BC-Instrumental support	BC-Positive reframing	.42	.22	1.40	.161	.780	.21 [−.09, .51]
BC-Instrumental support	BC-Planning	.39	.41	−.17	.865	.952	.03 [−.27, .32]
BC-Instrumental support	BC-Humor	−.03	.01	−.20	.841	.952	.03 [−.27, .33]
BC-Instrumental support	BC-Acceptance	.33	.12	1.40	.162	.780	.21 [−.09, .51]
BC-Instrumental support	BC-Religion	.05	.36	−2.00	.045	.482	.31 [.01, .60]
BC-Instrumental support	BC-Self-blame	.28	.33	−.29	.774	.952	.04 [−.26, .34]
BC-Instrumental support	Val.Mob.-Relationship	.13	−.19	2.02	.044	.482	.31 [.01, .61]
BC-Instrumental support	Val.Mob.-Intrusiveness	−.07	−.13	.38	.703	.952	.06 [−.24, .36]
BC-Instrumental support	Val.Mob.-Disqualification	−.19	.10	−1.84	.066	.534	.28 [−.02, .58]
BC-Instrumental support	Val.Mob.-Commitment	.04	.05	−.01	.989	.998	.00 [−.30, .30]
BC-Instrumental support	STAI-Y1	.00	.06	−.39	.700	.952	.06 [−.24, .36]
BC-Instrumental support	STAI-Y2	.39	−.05	2.92	.004	.255	.44 [.15, .74]
BC-Instrumental support	Val.Mob.-Total Score	−.21	.10	−1.96	.050	.482	.30 [.00, .60]

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Variable 1	Variable 2	*r* Males (*n* = 66)	*r* Females (*n* = 166)	*z*	*p*	adj–*p*	*d*
BC-Instrumental support	BDI	−.26	−.20	−.37	.714	.952	.06 [−.24, .35]
BC-Behavioral disengagement	BC-Venting	.14	−.17	2.00	.046	.482	.30 [.01, .60]
BC-Behavioral disengagement	BC-Positive reframing	.03	.01	.09	.925	.971	.01 [−.28, .31]
BC-Behavioral disengagement	BC-Planning	−.54	−.60	.51	.612	.952	.08 [−.22, .38]
BC-Behavioral disengagement	BC-Humor	.31	.42	−.76	.447	.952	.12 [−.18, .41]
BC-Behavioral disengagement	BC-Acceptance	−.06	−.11	.26	.793	.952	.04 [−.26, .34]
BC-Behavioral disengagement	BC-Religion	.32	.30	.10	.923	.971	.01 [−.28, .31]
BC-Behavioral disengagement	BC-Self-blame	−.03	−.02	−.05	.956	.978	.01 [−.29, .31]
BC-Behavioral disengagement	Val.Mob.-Relationship	.21	.44	−1.64	.100	.659	.25 [−.05, .55]
BC-Behavioral disengagement	Val.Mob.-Intrusiveness	−.13	−.15	.15	.879	.952	.02 [−.28, .32]
BC-Behavioral disengagement	Val.Mob.-Disqualification	.07	−.09	.99	.322	.942	.15 [−.15, .45]
BC-Behavioral disengagement	Val.Mob.-Commitment	−.06	.16	−1.43	.153	.780	.22 [−.08, .52]
BC-Behavioral disengagement	STAI-Y1	−.01	−.04	.19	.850	.952	.03 [−.27, .33]
BC-Behavioral disengagement	STAI-Y2	−.40	−.45	.37	.715	.952	.06 [−.24, .35]
BC-Behavioral disengagement	Val.Mob.-Total Score	.04	.05	−.09	.928	.971	.01 [−.29, .31]
BC-Behavioral disengagement	BDI	.11	.22	−.67	.502	.952	.10 [−.20, .40]
BC-Venting	BC-Positive reframing	.43	.09	2.34	.019	.396	.36 [.06, .66]
BC-Venting	BC-Planning	−.02	.37	−2.56	.010	.353	.39 [.09, .69]
BC-Venting	BC-Humor	.14	−.10	1.50	.134	.771	.23 [−.07, .53]
BC-Venting	BC-Acceptance	.29	.14	1.02	.306	.927	.16 [−.14, .45]
BC-Venting	BC-Religion	.14	.26	−.82	.415	.952	.12 [−.17, .42]

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Variable 1	Variable 2	*r* Males (n = 66)	*r* Females (n = 166)	*z*	*p*	adj–*p*	*d*
BC-Venting	BC-Self-blame	.28	.27	.05	.957	.978	.01 [–.29, .31]
BC-Venting	Val.Mob.-Relationship	.17	–.18	2.21	.027	.450	.34 [.04, .64]
BC-Venting	Val.Mob.-Intrusiveness	–.24	–.09	–.96	.338	.952	.15 [–.15, .44]
BC-Venting	Val.Mob.-Disqualification	–.11	.34	–2.85	.004	.255	.43 [.14, .73]
BC-Venting	Val.Mob.-Commitment	.19	.15	.27	.784	.952	.04 [–.26, .34]
BC-Venting	STAI-Y1	.05	.33	–1.83	.067	.534	.28 [–.02, .58]
BC-Venting	STAI-Y2	.05	.00	.29	.770	.952	.04 [–.25, .34]
BC-Venting	**Val.Mob.-Total Score**	**–.16**	**.45**	**–4.08**	**<.001**	**.011**	**.62 [.32, 92]**
BC-Venting	BDI	–.05	.17	–1.36	.175	.788	.21 [–.09, .51]
BC-Positive reframing	BC-Planning	–.13	.01	–.84	.399	.952	.13 [–.17, .43]
BC-Positive reframing	BC-Humor	.45	.39	.45	.654	.952	.07 [–.23, .37]
BC-Positive reframing	BC-Acceptance	.60	.55	.42	.675	.952	.06 [–.23, .36]
BC-Positive reframing	BC-Religion	.36	.19	1.16	.244	.868	.18 [–.12, .48]
BC-Positive reframing	BC-Self-blame	–.27	–.06	–1.33	.183	.788	.20 [–.10, .50]
BC-Positive reframing	Val.Mob.-Relationship	.12	.13	–.06	.950	.978	.01 [–.29, .31]
BC-Positive reframing	Val.Mob.-Intrusiveness	–.04	.22	–1.62	.106	.660	.25 [–.05, .55]
BC-Positive reframing	Val.Mob.-Disqualification	–.18	–.31	.84	.402	.952	.13 [–.17, .43]
BC-Positive reframing	Val.Mob.-Commitment	.04	.07	–.16	.873	.952	.02 [–.27, .32]
BC-Positive reframing	STAI-Y1	–.07	–.26	1.22	.223	.818	.19 [–.11, .48]
BC-Positive reframing	STAI-Y2	.13	.02	.70	.485	.952	.11 [–.19, .41]
BC-Positive reframing	Val.Mob.-Total Score	–.34	–.39	.43	.669	.952	.07 [–.23, .36]
BC-Positive reframing	BDI	–.38	–.41	.20	.838	.952	.03 [–.27, .33]
BC-Planning	BC-Humor	–.41	–.29	–.88	.380	.952	.13 [–.17, .43]

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Variable 1	Variable 2	*r* Males (n = 66)	*r* Females (n = 166)	*z*	*p*	adj–*p*	*d*
BC-Planning	BC-Acceptance	.04	.16	−.81	.416	.952	.12 [−.17, .42]
BC-Planning	BC-Religion	−.32	−.18	−.91	.364	.952	.14 [−.16, .44]
BC-Planning	BC-Self-blame	.35	.40	−.41	.683	.952	.06 [−.24, .36]
BC-Planning	Val.Mob.-Relationship	−.19	−.45	1.85	.064	.534	.28 [−.02, .58]
BC-Planning	Val.Mob.-Intrusiveness	.04	.01	.15	.882	.952	.02 [−.28, .32]
BC-Planning	Val.Mob.-Disqualification	.03	.10	−.44	.662	.952	.07 [−.23, .37]
BC-Planning	Val.Mob.-Commitment	−.11	−.04	−.40	.690	.952	.06 [−.24, .36]
BC-Planning	STAI-Y1	.08	.09	−.09	.929	.971	.01 [−.29, .31]
BC-Planning	STAI-Y2	.42	.41	.10	.922	.971	.01 [−.28, .31]
BC-Planning	Val.Mob.-Total Score	.14	.16	−.17	.869	.952	.03 [−.27, .32]
BC-Planning	BDI	−.02	−.16	.84	.404	.952	.13 [−.17, .43]
BC-Humor	BC-Acceptance	.27	.12	1.03	.304	.927	.16 [−.14, .46]
BC-Humor	BC-Religion	.25	.18	.49	.625	.952	.07 [−.22, .37]
BC-Humor	BC-Self-blame	−.40	−.02	−2.52	.012	.353	.38 [.09, .68]
BC-Humor	Val.Mob.-Relationship	.16	.25	−.60	.549	.952	.09 [−.21, .39]
BC-Humor	Val.Mob.-Intrusiveness	.15	.09	.33	.738	.952	.05 [−.25, .35]
BC-Humor	Val.Mob.-Disqualification	−.34	−.34	.00	.999	.999	.00 [−.30, .30]
BC-Humor	Val.Mob.-Commitment	.05	.25	−1.33	.183	.788	.20 [−.10, .50]
BC-Humor	STAI-Y1	−.36	−.31	−.38	.701	.952	.06 [−.24, .36]
BC-Humor	STAI-Y2	−.17	−.43	1.79	.074	.567	.27 [−.03, .57]
BC-Humor	Val.Mob.-Total Score	−.40	−.35	−.36	.717	.952	.06 [−.24, .35]
BC-Humor	BDI	−.42	−.31	−.84	.403	.952	.13 [−.17, .43]
BC-Acceptance	BC-Religion	.19	−.04	1.47	.140	.780	.22 [−.07, .52]

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Variable 1	Variable 2	*r* Males (n = 66)	*r* Females (n = 166)	*z*	*p*	adj–*p*	*d*
BC-Acceptance	BC-Self-blame	–.14	–.02	–.79	.432	.952	.12 [–.18, . 42]
BC-Acceptance	Val.Mob.-Relationship	.10	.04	.35	.723	.952	.05 [–.24, .35]
BC-Acceptance	**Val.Mob.-Intrusiveness**	**–.17**	**.42**	**–3.83**	**<.001**	**.015**	**.58 [.29, .88]**
BC-Acceptance	Val.Mob.-Disqualification	–.12	–.24	.80	.425	.952	.12 [–.18, .42]
BC-Acceptance	Val.Mob.-Commitment	.07	–.01	.53	.596	.952	.08 [–.22, .38]
BC-Acceptance	STAI-Y1	.05	–.25	1.95	.051	.482	.30 [.00, .60]
BC-Acceptance	STAI-Y2	.17	.28	–.73	.468	.952	.11 [–.19, .41]
BC-Acceptance	Val.Mob.-Total Score	–.21	–.25	.29	.775	.952	.04 [–.26, .34]
BC-Acceptance	BDI	–.29	–.29	–.01	.993	.998	.00 [–.30, .30]
BC-Religion	BC-Self-blame	–.20	.16	–2.29	.022	.396	.35 [.05, .65]
BC-Religion	Val.Mob.-Relationship	.02	.12	–.66	.511	.952	.10 [–.20, .40]
BC-Religion	Val.Mob.-Intrusiveness	–.02	–.12	.62	.538	.952	.09 [–.20, .39]
BC-Religion	Val.Mob.-Disqualification	–.06	.08	–.86	.392	.952	.13 [–.17, .43]
BC-Religion	Val.Mob.-Commitment	.07	.19	–.78	.437	.952	.12 [–.18, .42]
BC-Religion	STAI-Y1	–.02	.03	–.25	.801	.952	.04 [–.26, .34]
BC-Religion	STAI-Y2	–.07	–.23	1.03	.304	.927	.16 [–.14, .46]
BC-Religion	Val.Mob.-Total Score	.02	.12	–.63	.532	.952	.10 [–.20, .39]
BC-Religion	BDI	–.03	.07	–.63	.526	.952	.10 [–.20, .40]
BC-Religion	Val.Mob.-Relationship	–.04	–.20	1.06	.291	.927	.16 [–.14, .46]
BC-Self-blame	Val.Mob.-Intrusiveness	–.36	–.31	–.33	.738	.952	.05 [–.25, .35]
BC-Self-blame	Val.Mob.-Disqualification	–.06	.13	–1.25	.211	.788	.19 [–.11, .49]
BC-Self-blame	Val.Mob.-Commitment	–.01	.07	–.50	.617	.952	.08 [–.22, .38]

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Variable 1	Variable 2	*r* Males (n = 66)	*r* Females (n = 166)	*z*	*p*	adj–*p*	*d*
BC-Self-blame	STAI-Y1	.12	.16	−.23	.816	.952	.04 [−.26, .33]
BC-Self-blame	STAI-Y2	.16	.00	1.02	.309	.927	.16 [−.14, .45]
BC-Self-blame	Val.Mob.-Total Score	.36	.35	.02	.983	.998	.00 [−.30, .30]
BC-Self-blame	BDI	.37	.28	.64	.522	.952	.10 [−.20, .40]
Val.Mob.-Relationship	Val.Mob._ Intrusiveness	.12	.24	−.76	.450	.952	.12 [−.18, .41]
Val.Mob.-Relationship	Val.Mob.- Disqualification	−.29	−.26	−.18	.859	.952	.03 [−.27, .33]
Val.Mob.-Relationship	Val.Mob.- Commitment	.02	−.10	.80	.425	.952	.12 [−.18, .42]
Val.Mob.-Relationship	STAI-Y1	−.23	−.31	.53	.594	.952	.08 [−.22, .38]
Val.Mob.-Relationship	STAI-Y2	−.28	−.35	.52	.605	.952	.08 [−.22, .38]
Val.Mob.-Relationship	Val.Mob.-Total Score	−.28	−.22	−.39	.693	.952	.06 [−.24, .36]
Val.Mob.-Relationship	BDI	−.14	−.01	−.85	.396	.952	.13 [−.17, .43]
Val.Mob.-Relationship	Val.Mob.- Disqualification	−.29	−.33	.24	.808	.952	.04 [−.26, .34]
Val.Mob.-Relationship	Val.Mob.- Commitment	−.36	−.23	−.88	.376	.952	.13 [−.16, .43]
Val.Mob._Intrusiveness	STAI-Y1	−.34	−.30	−.25	.804	.952	.04 [−.26, .34]
Val.Mob._Intrusiveness	STAI-Y2	.09	.04	.28	.783	.952	.04 [−.26, .34]
Val.Mob._Intrusiveness	Val.Mob.-Total Score	−.42	−.45	.22	.823	.952	.03 [−.26, .33]
Val.Mob._Intrusiveness	BDI	−.45	−.42	−.25	.806	.952	.04 [−.26, .34]
Val.Mob.- Disqualification	Val.Mob.- Commitment	.46	.41	.44	.662	.952	.07 [−.23, .37]
Val.Mob.- Disqualification	STAI-Y1	.77	.80	−.42	.675	.952	.06 [−.23, .36]
Val.Mob.- Disqualification	STAI-Y2	−.30	−.25	−.37	.711	.952	.06 [−.24, .36]
Val.Mob.- Disqualification	Val.Mob.-Total Score	.49	.74	−2.52	.012	.353	.38 [.09, .68]
Val.Mob.- Disqualification	BDI	.44	.58	−1.18	.238	.859	.18 [−.12, .48]

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Variable 1	**Variable 2**	***r* Males** (n = 66)	***r* Females** (n = 166)	*z*	*p*	**adj–*p***	*d*
Val.Mob.-Commitment	STAI-Y1	.35	.21	.92	.360	.952	.14 [–.16, .44]
Val.Mob.-Commitment	STAI-Y2	–.36	–.42	.43	.668	.952	.07 [–.23, .36]
Val.Mob.-Commitment	Val.Mob.-Total Score	.22	.25	–.18	.855	.952	.03 [–.27, .33]
Val.Mob.-Commitment	BDI	.18	.12	.40	.691	.952	.06 [–.24, .36]
STAI-Y1	STAI-Y2	.01	–.11	.75	.451	.952	.11 [–.18, .41]
STAI-Y1	Val.Mob.-Total Score	.46	.68	–2.11	.035	.482	.32 [.02, .62]
STAI-Y1	BDI	.49	.58	–.77	.444	.952	.12 [–.18, .42]
STAI-Y2	Val.Mob.-Total Score	.00	–.12	.77	.443	.952	.12 [–.18, .42]
STAI-Y2	BDI	–.06	–.03	–.16	.875	.952	.02 [–.27, .32]
Val.Mob.-Total Score	BDI	.77	.75	.37	.712	.952	.06 [–.24, .36]

Legenda. BC = Brief COPE; Val.Mob. = Val.Mob. scale; STAY-Y1 = State Anxiety; STAY-Y2 = Trait Anxiety; BDI = B*eck Depression Inventory*.

Note. Bolded rows indicate significant comparisons at adjusted p<.05.

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Analysis of the rarity of differences in FSIQ in the Italian sample of the WISC–V

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ABSTRACT. L'obiettivo del presente lavoro è indagare, nell'adattamento italiano della *Wechsler Intelligence Scale for Children – V edizione (WISC–V)*, l'unitarietà del Quoziente Intellettivo Totale (QIT) e di tre scale composite (Indice di Abilità Generale – IAG, Indice di Competenza Cognitiva – ICC e Indice Non Verbale – INV), al fine di determinarne gli specifici valori soglia. A tale scopo sono stati analizzati i base rate delle discrepanze tra i punteggi dei subtest e sono stati eseguiti calcoli statistici per individuare le soglie delle differenze ampie e rare. I risultati confermano la validità dell'approccio statistico utilizzato e della sua integrazione con i base rate nel determinare le soglie per il QIT e per gli indici IAG, ICC e INV della WISC–V.

SUMMARY. The objective of this study is to investigate the unitarity of the Full Scale IQ (FSIQ) and three composites (General Ability Index – GAI, Cognitive Proficiency Index – CPI, Nonverbal Index – NVI) of the Italian adaptation of the WISC–V, aiming to determine their specific rarity thresholds. The importance of this aim is to determine if there is the possibility of using the FSIQ (or GAI, CPI, NVI) as a unique factor deviation quotient or not, by an accurate representation of the ability it is intended to assess. The distributions of the differences between maximum and minimum value (Max–Min discrepancies) were calculated using the Italian WISC–V standardization sample. The base rates of these discrepancies were analyzed, and statistical calculations of thresholds for large and rare differences were performed. The results confirm the validity of this statistical approach in determining the thresholds for the FSIQ and the indices of the WISC–V that corresponds to rare and unusual discrepancies. The obtained results combine the psychometric approach developed in previous versions of the Wechsler scales with the effective findings in the population as reflected by base rates (Flanagan & Kaufman, 2004, 2009; Orsini, Pezzuti & Hulbert, 2015). However, the FSIQ should not be classified as "uninterpretable" under any circumstances. Doing so would ignore its inherent predictive value, which remains intact regardless of score variability (Daniel, 2007).

Keywords: *WISC–V, Unitarity of intelligence, FSIQ, Rarity thresholds, Base rates*

INTRODUCTION

The FSIQ is the most reliable score on the WISC–V and is typically reported and interpreted as a summary of a child's intellectual abilities. However, significant variability among the scores that comprise the FSIQ can undermine its validity as a summary measure. (Flanagan & Alfonso, 2017)

The concept of the unitarity of composites and the FSIQ has been explored in previous editions of the Wechsler scales, where the issue arose of determining when to use the FSIQ or the corresponding factor deviation quotient. In addressing this question, Kaufman (1994) revisited the notion of the unitary construct of the FSIQ. According to Flanagan and Kaufman (2004, 2009), if a significant discrepancy is observed among the scaled scores that constitute a given index, that index does not provide an accurate representation of the ability it is intended to assess and, consequently, cannot be interpreted correctly, as it does not reflect a single ability. Conversely, an ability is considered unitary when it is formed by a cohesive set of scaled scores, each of which reflects unique or slightly different aspects of the ability itself.

Research conducted after the publication of *Essentials of WISC–IV Assessment (*Flanagan & Kaufman, 2004, 2009) showed the importance of the evaluation of the proportion of subjects (i.e., base rates) in the standardization sample that occur in a psychometrically defined threshold (Orsini, Pezzuti & Hulbert, 2014). Score differences that occur in <10% of the population are considered rare (Flanagan & Alfonso, 2017)

Some authors suggest that the interpretation of the FSIQ must consider the variability among the subtest scores that compose it. When this variability is minimal, the FSIQ can be interpreted as a cohesive measure of overall intellectual ability. However, when variability is large and rare, the FSIQ may not be a valid summary, and a more detailed analysis of the index scores is necessary to provide a comprehensive understanding of the individual's cognitive abilities (Flanagan & Alfonso, 2017). However, it's crucial to understand that the FSIQ maintains its predictive validity even when there is significant variability among the subtest scores that compose it. Daniel (2007) emphasized that the FSIQ's construct, and predictive validity are independent of the variability in the component scores. This means that despite large discrepancies among subtest scores, the FSIQ can still provide valuable predictive information. Given this, the FSIQ should not be classified as "uninterpretable" under any circumstances. Doing so would ignore its inherent predictive value, which remains intact regardless of score variability.

METHOD

Participants

The sample used for the following study is the Italian standardization sample of the WISC–V test, composed of 1,410 subjects aged between 6 years and 0 months and 16 years and 11 months, balanced for gender (M = 50.2%, F = 49.8%) and representative of the Italian population (see Wechsler, 2023).

Data analysis

Unlike in the WISC–IV, where the FSIQ was composed of the sum of the scores of four composites (Verbal Comprehension Index – VCI, Perceptual Reasoning Index – PRI, Working Memory Index – WMI, Processing Speed Index – PSI), in the fifth version of the battery, the calculation of the FSIQ score is derived from the sum of the scaled scores of seven primary subtests. Therefore, the calculation of the unitarity of the FSIQ follows the typical approach for composites, namely the Max–Min difference of the scaled scores of the subtests that compose it (see Wechsler, 2023).

To study the unitarity of the FSIQ and the composites, the distributions of the Max–Min values of the scaled scores that compose the FSIQ and the composites of the WISC–V were analyzed. To do so for each index, the difference between the maximum and minimum values of the scaled scores for the subtests that compose them was calculated. These differences are thus always positive.

This analysis was conducted for the composites composed of more than two subtests, as for the composites composed of two subtests, pairwise comparisons between the subtests have already been analyzed in the Italian validation study.

Subsequently, an analysis of variance (ANOVA) was conducted to evaluate whether the Max–Min differences between the subtests that compose the FSIQ are independent of the age and education level of the mother or the level of the FSIQ.

For each of these differences, absolute frequency, percentage frequency, and the base rate (%Ss) have been

calculated, which represents the percentage of subjects who obtained a value of difference equal to or greater than a specified threshold. The trend of the Max–Min distribution allows clinicians to assess how much and in what manner any threshold affects the reference sample of the test.

The statistical calculation of the rarity threshold values for the FSIQ and the composites of the WISC–V was performed using the method proposed by Flanagan and Kaufman (2004, 2009) and the subsequent modifications by Orsini, Pezzuti and Hulbert (2014). This method uses the formula:

Difference Threshold = $M_{\text{Max–Min}}$ + z*$SD_{\text{Max–Min}}$ where $M_{\text{Max–Min}}$ represents the mean of the distribution of the Max–Min differences (range) of the scaled scores of the subtests that compose the FSIQ or the index, $SD_{\text{Max–Min}}$ is the standard deviation of this distribution, and z is the normal distribution value (one–tailed) associated with the chosen percentage of subjects.

The lower this percentage, the greater the differences needed to be defined as rare. Conversely, the higher the chosen percentage, the smaller the differences needed to be defined as rare. While there is no universally accepted percentage of subjects considered rare, following Flanagan and Kaufman (2004, 2009), a value of 6.7% of the population (corresponding to z = 1.5) can be considered an adequate rarity criterion. For the sake of completeness, this text will also illustrate the threshold values for both lower and higher percentages.

RESULTS

The analysis of variance conducted confirmed that, similarly to what found for the WISC–IV, in the WISC–V as well, the distribution of Max–Min differences for the subtests composing the FSIQ is independent of age, maternal education level, and FSIQ level (<80, 80–89, 90–109, 110–119, >119). All main effects and interactions were found to be statistically non–significant (p>.05) (see Table 1).

Table 1 – ANOVA Max–Min FSIQ difference as dependent variable by age, mother's education level, FSIQ level and their interactions as factors (independent variables)

Factor	F	*df*	*p*
Age	1.59	10;1217	.104
Mother's education level	1.38	4;1217	.238
FSIQ level	1.42	4;1217	.226
Age * Mother's education level	1.02	32;1217	.443
Age * FSIQ level	.94	40;1217	.574
Mother's education level * FSIQ level	.33	14;1217	.990

Legenda. df = degree of freedom; FSIQ = *Full Scale IQ*.

Therefore, were calculated the percentage frequencies, and base rates of subjects (%Ss) for the different composites (see Table 2).

From these distributions of Max–Min differences, it is therefore possible to calculate the parameters of mean and standard deviation, which allow deriving the difference thresholds for different percentages of the population (5%, 6.7%, 8%, 10%, 13%) (see Table 3).

A Max–Min difference among the weighted scores that compose a specific composite greater than the threshold value at a certain percentage of subjects will indicate the presence of a rare difference in that composite. As expected, the difference threshold value decreases as the selected percentage of subjects increases. This implies that a higher percentage will identify smaller weighted score differences as rare and unusual. However, since these differences are always

Table 2 – Descriptives of the discrepancies of FSIQ, GAI, CPI and NVI

FSIQ			GAI			CPI			NVI		
Disc	*%Freq*	*%Ss*	*Disc*	*%Freq*	*%Ss*	*Disc*	*%Freq*	*%Ss*	*Disc*	*%Freq*	*%Ss*
15	.07	.07	13	.35	.35	13	.14	.14	15	.07	.07
14	.28	.36	12	.50	.85	12	.36	.50	14	.14	.21
13	.50	.85	11	1.35	2.20	11	1.85	2.35	13	.36	.57
12	1.64	2.49	10	2.20	4.40	10	1.85	4.20	12	.85	1.42
11	3.06	5.55	9	4.04	8.44	9	4.70	8.90	11	2.06	3.49
10	4.70	10.25	8	7.59	16.03	8	7.19	16.09	10	4.27	7.76
9	9.18	19.43	7	11.49	27.52	7	9.61	25.69	9	7.76	15.52
8	13.24	32.67	6	16.38	43.90	6	13.31	39.00	8	9.54	25.05
7	16.94	49.61	5	17.73	61.63	5	14.23	53.24	7	15.80	40.85
6	18.58	68.19	4	16.67	78.30	4	17.30	70.53	6	17.58	58.43
5	14.38	82.56	3	14.04	92.34	3	15.52	86.05	5	16.44	74.88
4	11.53	94.09	2	6.52	98.87	2	10.04	96.09	4	13.59	88.47
3	4.56	98.65	1	1.06	99.93	1	3.49	99.57	3	8.90	97.37
2	1.35	100.00	0	.07	100.00	0	.43	100.00	2	2.42	99.79
									1	.21	100.00

Legenda. FSIQ = *Full Scale IQ*; GAI = General Ability Index; CPI = Cognitive Proficiency Index; NVI = Nonverbal Index; Disc = discrepancy; %Freq = percentage frequencies; %Ss = base rates.

Table 3 – Mean, standard deviation and discrepancy thresholds

Index	Parameter		Threshold				
	Mean	*SD*	*5%*	*6.7%*	*8%*	*10%*	*13%*
FSIQ	6.65	2.22	10.3	10.0	9.8	9.5	9.2
GAI	5.35	2.20	9.0	8.7	8.5	8.2	7.8
CPI	5.02	2.38	8.9	8.6	8.4	8.1	7.7
NVI	6.14	2.24	9.8	9.5	9.3	9.0	8.7

Legenda. FSIQ = *Full Scale IQ*; GAI = General Ability Index; CPI = Cognitive Proficiency Index; NVI = Nonverbal Index.

integer values, this change does not always translate into appreciable differences in the test's practical use.

To confirm the results of this study, comparing the threshold values relative to the 6.7% of the population with the %Ss found in the standardization sample shows that this criterion for rarity of differences effectively isolates a percentage of subjects always less than 10% across all composites. The data derived from parametric statistics is thus consistent with the analysis of empirical distributions, supporting its use in practical test applications.

CONCLUSION

This study has allowed us to calculate, similar to previous versions of the Wechsler scales, the rarity criterion for differences within the FSIQ and composites of the WISC–V. The analyses conducted have demonstrated that the distribution of these differences does not vary within the test's standardization sample. Therefore, a single threshold value can be considered for all different age ranges within the sample. Through appropriate statistical procedures, we have calculated this threshold value for various percentages of the population.

If the difference between the weighted scores of the subtests that compose a composite/FSIQ exceeds the identified threshold value, it indicates that this difference is identifiable as "rare", suggesting that the index in question does not represent a cohesive summary of the child's functioning. For example, considering the FSIQ, Table 3 identifies a threshold value for rarity of differences in 6.7% of cases as 10.0. If the difference between the highest and lowest weighted scores among the 7 subtests that compose the FSIQ is greater than 10.0, the ability cannot be considered a unitary measure. Conversely, if the difference is equal to or less than 10.0, it indicates that the FSIQ score provides a cohesive summary of the child's functioning.

In evaluating the rarity of differences, different percentages of subjects can be considered simply by applying the corresponding difference threshold for the desired population percentage.

The obtained results combine the psychometric approach developed in previous versions of the Wechsler scales with the effective findings in the population as reflected by base rates. It is always prudent to integrate both the psychometric approach and the empirical findings in the population, as reflected by base rates. This approach ensures a comprehensive understanding of the actual rarity of observed differences within the population (Flanagan & Kaufman, 2004, 2009; Orsini et al., 2014).

It's very important consider that, however, coherently with Daniel (2007) and FSIQ maintains its predictive validity even when there is significant variability among the subtest scores that compose it. This means that despite large discrepancies among subtest scores, the FSIQ can still provide valuable predictive information.

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Strike a match on my burnout perceptions: Evidence on the validity of measuring burnout through a visual scale in Italy

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ABSTRACT. Questa ricerca esplora la validità e l'affidabilità di Matches, una scala visiva per misurare il burnout lavorativo nel contesto italiano. Matches è una scala a singolo item, che utilizza l'immagine di una serie di fiammiferi consumati a livelli crescenti, da un fiammifero intatto a un mucchio di cenere. Il primo studio (*N* = 1241) conferma la validità convergente con la versione italiana del *Copenaghen Burnout Inventory* (*CBI*) e mostra la similitudine delle due misure nel mappare profili psicologici basati sul continuum work engagement-burnout. La validità di criterio è parzialmente confermata da correlazioni significative con workaholism e prestazioni lavorative e contestuali. La misura Matches mostra validità incrementale rispetto al CBI nel prevedere l'engagement lavorativo e le prestazioni. Tuttavia, emergono differenze nei risultati sociodemografici tra Matches e CBI. Il secondo studio (*N* = 564) dimostra una forte affidabilità test–retest della misura Matches e attesta la sua validità predittiva nei confronti della salute auto–valutata.

SUMMARY. This research investigates the validity of the Matches visual burnout scale in Italy, examining convergent, criterion, incremental, and predictive validity, test–retest reliability, and sociodemographic differences. Study 1, involving 1241 Italian employees, supports convergent validity with the Italian version of the Copenhagen Burnout Inventory (CBI). Person–centered analyses reveal similarities in employees' profiles using both measures. Criterion validity is partially confirmed by significant correlations with workaholism, task, and contextual performance. However, person–centered analyses highlight differences in the nomological network of burnout across profiles estimated with different burnout assessments. The Matches measure shows incremental validity over the CBI in predicting work engagement and task performance. Yet, sociodemographic differences are inconsistent between the Matches measure and the CBI. Study 2, with 564 employees, indicates strong test–retest reliability of the Matches measure. Additionally, the Matches measure significantly predicts subsequent self–rated health.

Keywords: *Burnout, Job performance, Validity, Workaholism, Work engagement*

INTRODUCTION

Burnout is a syndrome resulting from "chronic workplace stress that has not been successfully managed" (World Health Organization, 2019). Recent data indicate that, in Italy, approximately 70% of employees perceived experiencing burnout in 2023 (Rossi, 2023). The high prevalence of burnout has significantly increased in recent years, further exacerbated by the pandemic. These findings underscore the necessity for implementing approaches to design policies and programs to prevent burnout. Additionally, there is a need to assist company leaders in identifying burnout signals and adopting strategies to minimize the risk of its development.

Several burnout definitions exist in the literature, overall agreeing that burnout is "a state of physical, emotional and mental exhaustion that results from long–term involvement in work situations that are emotionally demanding" (Schaufeli & Greenglass, 2001, p. 501) or from chronic exposure to stressors (Demerouti, Bakker, Nachreiner & Schaufeli, 2001). Importantly, while the literature acknowledges burnout as multifaceted (Maslach & Jackson, 1981), disagreement persists regarding the precise nature of its factor structure (Heinemann & Heinemann, 2017). Despite these inconsistencies, exhaustion (i.e., depletion or fatigue) is recognized as the core and first–emerging component of burnout (Lee & Ashforth, 1996), its fundamental strain dimension (Bakker, Demerouti & Sanz–Vergel, 2014), and the one that appears across all conceptualizations and is the most frequently measured dimension (Maslach & Leiter, 2008; Zapata, Calderwood & Boncoeur, 2022).

Notably, burnout is associated with a range of negative outcomes, including decreased work performance, reduced work engagement and motivation, increased turnover, and more sick days, all of which entail associated economic costs (Zapata et al., 2022).

Numerous psychometric scales have been developed to assess burnout, including the 22–item *Maslach Burnout Inventory* (*MBI*; Maslach & Jackson, 1981) and the *Copenhagen Burnout Inventory* (*CBI*; Kristensen, Borritz, Villadsen & Christensen, 2005). However, the inclusion of a substantial number of items in these scales raises concerns about participant fatigue, which is particularly problematic considering that burnout–related risk factors increase inattention, potentially leading to measurement errors. To address this issue, a single–item burnout visual scale was recently validated in the U.S., aiming to use an image of a series of increasingly burnt matches, from an intact match to a pile of ashes, to measure job burnout (Zapata et al., 2022).

The adoption of a visual scale composed of a single item for measuring burnout presents several distinct advantages over traditional psychometric scales with multiple sentences. First, the simplicity of a single–item visual scale streamlines the assessment process, making it more time–efficient and user–friendly. Employees and organizational leaders can quickly and easily provide feedback without the cognitive burden associated with longer, more complex instruments. Additionally, the visual nature of the scale may enhance accessibility for individuals with varying levels of literacy or language proficiency, promoting inclusivity in assessments. Second, the brevity of a single–item visual scale reduces respondent fatigue and increases the likelihood of consistent and reliable data collection, especially in busy work environments. This is particularly advantageous when collecting data from participants experiencing extenuating circumstances, such as high overload (Barr, Spitzmüller & Stuebing, 2008), who may otherwise be nonrespondents in burnout surveys but represent targeted populations in burnout research. Additionally, it proves advantageous in longitudinal studies or when repeated assessments are necessary to monitor changes in burnout over time. The visual scale's simplicity also facilitates real–time monitoring, enabling timely interventions to address emerging burnout issues within organizations. Third, in terms of administration and interpretation, a single–item visual scale may yield clearer and more immediate results, making it easier for organizational leaders to identify trends and prioritize interventions effectively. Finally, the visual nature of the scale allows for a quick and intuitive grasp of respondents' perceptions, potentially capturing nuanced emotional states that might be overlooked in more extensive, text–based assessments. Overall, the use of a single–item visual scale for burnout assessment offers practical advantages in terms of efficiency, accessibility, and real–time monitoring, making it a valuable tool for both researchers and practitioners in the field.

Aims

Given the potential advantages for both research and practice, this research aims to investigate the validity of the Matches visual burnout scale developed by Zapata and

colleagues (2022) within the Italian context. To achieve this goal, we examine (i) convergent validity of the Matches scale by comparing it to the Italian version of the CBI, (ii) criterion/discriminant validity by investigating its relationships with work engagement, workaholism, and performance, and (iii) incremental validity by assessing the Matches measure's contribution to explaining the variance in relevant work outcomes. Furthermore, to comprehensively explore how the Matches measure aligns with existing validated scales in mapping burnout, we additionally investigate (iv) differences across sociodemographic characteristics when assessing burnout using the Italian version of the CBI and the Matches measure. Finally, we explore (v) test–retest reliability and (vi) predictive validity of the Matches measure over self–rated health across two time points.

Hypotheses

Drawing on earlier evidence showing that, in the U.S., the Matches measure captures burnout equivalent to other existing validated measures and that it relates negatively to work engagement – a psychological motivational state of vigor, dedication, and absorption (Schaufeli, Salanova, González–Romá & Bakker, 2002) – at a magnitude consistent with previous evidence obtained using different burnout scales, we expect similar results in the Italian context and propose:

– Hypothesis 1: The Matches measure is (a) positively highly correlated with the Italian version of the CBI and (b) negatively correlated with work engagement at a magnitude consistent with that of the Italian version of the CBI.

Adopting a person–centered approach and building upon prior research demonstrating that patterns of the employee experience can be discerned by utilizing the two standard endpoints of the burnout–engagement continuum (Leiter & Maslach, 2016), we further investigate whether and how the burnout visual scale can effectively map employees' profiles across the burnout–engagement continuum (Mäkikangas, Hyvönen & Feldt, 2017) in a manner consistent with another established scale, namely the CBI. We anticipate that the Matches measure will demonstrate comparable performance to the CBI in delineating such configurations of employees' profiles:

– Hypothesis 2: Estimating employees' profiles of the burnout–engagement continuum using the CBI and the Matches measure results in qualitatively and quantitatively similar employee profiles.

According to the literature, workaholism is related to burnout symptoms because it leads to impaired recovery (Balducci et al., 2021). Moreover, evidence shows that burnout constitutes a mediator in the energy–draining process, which leads to health impairment (Demerouti et al., 2001), consequently affecting performance negatively. Indeed, empirical findings indicate that burnout correlates with various somatic symptoms and mental health aspects, such as depression or the utilization of antidepressant medication (Jensen & Knudsen, 2017). Therefore, we investigate the nomological network of burnout and explore how the Matches scale relates to workaholism, performance, and self–rated health. Building on evidence from the U.S. indicating significant relations between the Matches measure and theoretically relevant burnout criteria, we propose:

– Hypothesis 3: The Matches measure is significantly (a) positively correlated with workaholism and (b) negatively correlated with task and contextual performance.
– Hypothesis 4: Employees' profiles of the burnout–engagement continuum, estimated using the CBI and the Matches measure, display similar levels of (a) workaholism and (b) task and contextual performance.
– Hypothesis 5: The Matches measure significantly predicts lower self–rated health.

Moreover, we explore the incremental and relative importance of the burnout visual scale in explaining the variance of relevant work outcomes. Evidence from the U.S. showed that the Matches measure yielded incremental validity over existing burnout measures in predicting organizationally relevant criteria (Zapata et al., 2022), likely attributable to the advantages conferred by a concise, visual measure. These advantages include mitigated participant fatigue (Hinkin, 2005), diminished necessity for translating emotions into words (Kunin, 1998), and enhanced participant comprehension (Gabriel et al., 2019). Accordingly, the attributes of the visual scale may facilitate a broader depiction of the construct, accessing facets not readily accessible through conventional text items, thereby furnishing additional explanatory value while still capturing the burnout domain. Consistent with such arguments, we expect that the Matches measure will contribute significantly to the variance of theoretically relevant criteria:

– Hypothesis 6: The Matches measure yields incremental validity over the Italian version of the CBI in predicting (a) work engagement, (b) task, and (c) contextual performance.

METHOD

Participants and procedure

Study 1. Participants were asked to complete an anonymous, web–based survey. Participation was voluntary and employees received information about the study aims and that responses were anonymous. To complete the survey, participants had to meet the following criteria, assessed in the opening questions: having a work experience of at least six months, working at least 20 hours/week, and being employed (as opposed to self–employed). Data collection took place in February and March 2023 in Italy. The final sample consisted of 1241 participants (58.5% women; M_{age} = 41.30 years; SD_{age} = 13.69) working in different organizations ($M_{seniority}$ = 11.04 years; $SD_{seniority}$ = 11.12) in Italy.

Study 2. Participants were asked to complete two anonymous, web–based surveys, one at the beginning of the workweek (Monday) and another at its conclusion (Friday). They were asked to create a personal code by providing the initial letters of their relatives so that responses were associated across time while maintaining anonymity. The inclusion criteria mirrored those of Study 1. Data were collected in Italy in May 2024 as part of a larger data collection, with only data pertaining to the Matches measure and self–rated health utilized in the present research. The final matched sample consisted of 564 employees (76% response rate; 50.4% women; M_{age} = 42.52 years; SD_{age} = 13.85) working in different organizations in Italy.

Measures

All scales were administered in Italian. Scales not available in Italian were translated using back–translation.

– *Burnout* was assessed using the Italian version (Avanzi, Balducci & Fraccaroli, 2013) of the work–related burnout scale of the *Copenhagen Burnout Inventory* (*CBI*; Kristensen et al., 2005) and the 8–point Matches visual scale developed by Zapata and colleagues (2022). A sample item of the CBI is: "Are you exhausted in the morning at the thought of another day at work?". Participants responded on a 5–point scale from 1 = never to 5 = always. The Matches measure is a single–item showing a set of 8 match images that have been consumed at increasing levels, ranging from a fresh match to a pile of ash. Respondents were asked to select the match that best represents how burned out they currently felt by clicking on it. Specifically, the instructions read as follows: "Job burnout refers to feeling physically, mentally, and emotionally exhausted. Please select the match that best represents how burned out you currently feel by clicking on it". In Study 2, participants completed the Matches measure at both time points.
– *Work engagement* was measured with the Italian version (Balducci, Fraccaroli & Schaufeli, 2010) of the *Utrecht Work Engagement Scale* (Schaufeli et al., 2002). This scale measures three dimensions of work engagement: vigor (3 items, e.g., "At my work, I feel bursting with energy"), dedication (3 items, e.g., "I am enthusiastic about my job"), and absorption (3 items, e.g., "I feel happy when I am working intensely"). Responses were given on a 7–point scale, ranging from 0 = never, to 6 = always.
– *Workaholism* was assessed with the scale developed by Clark and colleagues (Clark, Smith & Haynes, 2020), recently validated in Italian by Buono and colleagues (2024), which comprehends four subscales with four items each: motivational (e.g., "I always have an inner pressure inside of me that drives me to work"), cognitive (e.g., "I feel like I cannot stop myself from thinking about working"), emotional (e.g., "I am almost always frustrated when I am not able to work"), and behavioral (e.g., "I tend to work beyond my job's requirements"). Items were rated on a 5–point scale ranging from 1 = never, to 5 = always.
– *Performance* was assessed with two scales from the *Individual Work Performance Questionnaire* (Koopmans, Bernaards, Hildebrandt, de Vet & van der Beek, 2014), i.e., task performance (5 items, e.g., "In the past 3 months, I managed to plan my work so that it was done on time") and contextual performance (8 items, e.g., "In the past 3 months, I took on extra responsibilities"). Responses were given on a 6–point scale, from 1 = seldom to 6 = always.
– *Self–rated health* was assessed in Study 2 at Time 2 using the WHO measure (World Health Organization, 1996), which asks participants to rate their health on a 5–point scale, from very good to very bad.

Data analysis

Descriptive statistics, reliabilities, and correlations were computed using IBM SPSS (Version 26.0). Study 1 focused on assessing convergence, criterion, and incremental validity, as well as sociodemographic differences. Study 2 assessed consistency via test–retest reliability, inspecting the correlation between the Matches measure assessed across two time points, and predictive validity by using a regression analysis, with the Matches measure at Time 1 entered as a predictor of self–rated health at Time 2.

To investigate convergent validity, we compared the Matches measure with an existing measure of the same construct, i.e., the CBI. In doing so, we adopted both a variable– and a person–centered approach. Following a variable–centered approach, we inspected the correlation coefficients between the Italian version of the CBI and the Matches measure. Adopting a person–centered approach, after dividing the sample into two halves, we used latent profile analysis (LPA) and investigated whether similar employees' profiles emerged when assessing burnout using the two different scales.

LPA estimates the probability of individual assignment to specific profiles, exploring how different variables contribute to employees' profiles (Spurk, Hirschi, Wang, Valero & Kauffeld, 2020). To determine the best–fitting profile solution, we used Mplus v.8.4 (Muthén & Muthén, 1998–2017) and compared models with two to six profiles based on the scores of burnout and work engagement dimensions. Parameters of the solutions were estimated using maximum likelihood with robust standard errors (MLR), and full information maximum likelihood was used to process missing data in this phase. We utilized indices such as Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), sample–adjusted Bayesian Information Criterion (SABIC), Lo–Mendell–Rubin Test (LMR), Bootstrap Likelihood Ratio Test (BLRT), and entropy value to assess model fit (Ferguson et al., 2020; Howard & Hoffman, 2018; Nylund et al., 2007). Lower AIC and BIC values indicate better model superiority, while significant LMR and BLRT *p*–values reject a model with *k* profiles compared to k + 1 profiles. Higher entropy values, acceptable between .60 and .80 (Muthén, 2004; Jung & Wickrama, 2008; Spurk et al., 2020), indicate greater classification accuracy.

Criterion validity was examined by adopting both a variable– and a person–centered approach. In the variable–centered approach, we explored the correlations between the Matches measure and work engagement, task and contextual performance, and workaholism. Following a person–centered approach, we used the BCH method (Asparouhov & Muthén, 2021) to analyze the distribution of performance and workaholism across profiles estimated using the CBI and the Matches measure and work engagement dimensions.

Incremental validity was assessed by investigating the relative contributions of the Matches measure beyond the variance of burnout outcomes and antecedents explained by the CBI. We used hierarchical regression analyses, in which we entered the CBI in the first step and the Matches measure in the second step.

Finally, differences across sociodemographic characteristics were inspected using *t*–tests and one–way independent sample ANOVAs, the latter with Bonferroni post–hoc.

RESULTS

Table 1 presents descriptive statistics, internal consistency, and correlation estimates for Study 1.

Convergent validity

Results from correlation analysis (see Table 1) attested to a significant, strong, and positive relation between the CBI and the Matches measure ($r = .59$; $p<.001$) and a significant and negative relation between the Matches measure and work engagement ($r = -.34$; $p<.001$), providing support for Hypothesis 1.

Table 2 presents the results from LPA conducted on the two halves of the sample, featuring fit indices and tests for alternative profile solutions. The 3–profile model emerged as the best fit for both measures, as indicated by several indicators: AIC and BIC elbow plots showed no substantial improvement beyond this model, a significant LMR *p*–value indicated superiority over the 2–profile model, and there was no advantage over the 4–profile model. Additionally, each profile contained at least 3% of the sample size, indicating the absence of small–size profiles (Spurk et al., 2020).

The 3–profile solutions resulting from the two halves of the sample are visually represented in Figure 1. Across both samples, Profile 1 exhibited low levels of all engagement

Table 1 – Study 1: descriptive statistics, reliabilities, and correlations among participants' demographics and study variables

	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Gender	.59 (.49)	–													
2. Age	41.30 (13.69)	.06*	–												
3. Seniority in the current organization	11.04 (11.13)	−.02	.64**	–											
4. Supervisor duties	.49 (.50)	−.18**	.10**	.12**	–										
5. Work engagement	3.56 (1.21)	.03	.02	−.09**	.18**	(.93)									
6. Workaholism	2.44 (.74)	−.02	.03	−.01	.14*	.25**	(.89)								
7. Motivational	2.86 (.92)	.01	.03	−.01	.02	.16**	.76**	(.77)							
8. Cognitive	2.30 (1.05)	.01	.05	.02	.12**	.15**	.80**	.51**	(.93)						
9. Emotional	1.88 (.92)	−.05	−.02	−.06*	.08**	.21**	.76**	.44**	.48**	(.89)					
10. Behavioral	2.73 (.99)	−.05	.04	.02	.19**	.25**	.75**	.40**	.44**	.44**	(.83)				
11. Task performance	4.32 (.92)	.04	.07**	.02	.06*	.27**	−.03	−.02	−.12**	−.04	.10**	(.84)			
12. Contextual performance	4.10 (1.03)	−.03	.02	−.01	.29**	.50**	.32**	.24**	.21**	.16**	.37**	.35**	(.87)		
13. CBI	2.58 (.87)	.08**	−.12**	−.03	−.05	−.42**	.30**	.25**	.34**	.14**	.18**	−.20**	−.10**	(.87)	
14. Matches	3.20 (1.68)	.03	−.03	.03	.01	−.34**	.25**	.19**	.26**	.15**	.16**	−.19**	−.08**	.59**	–

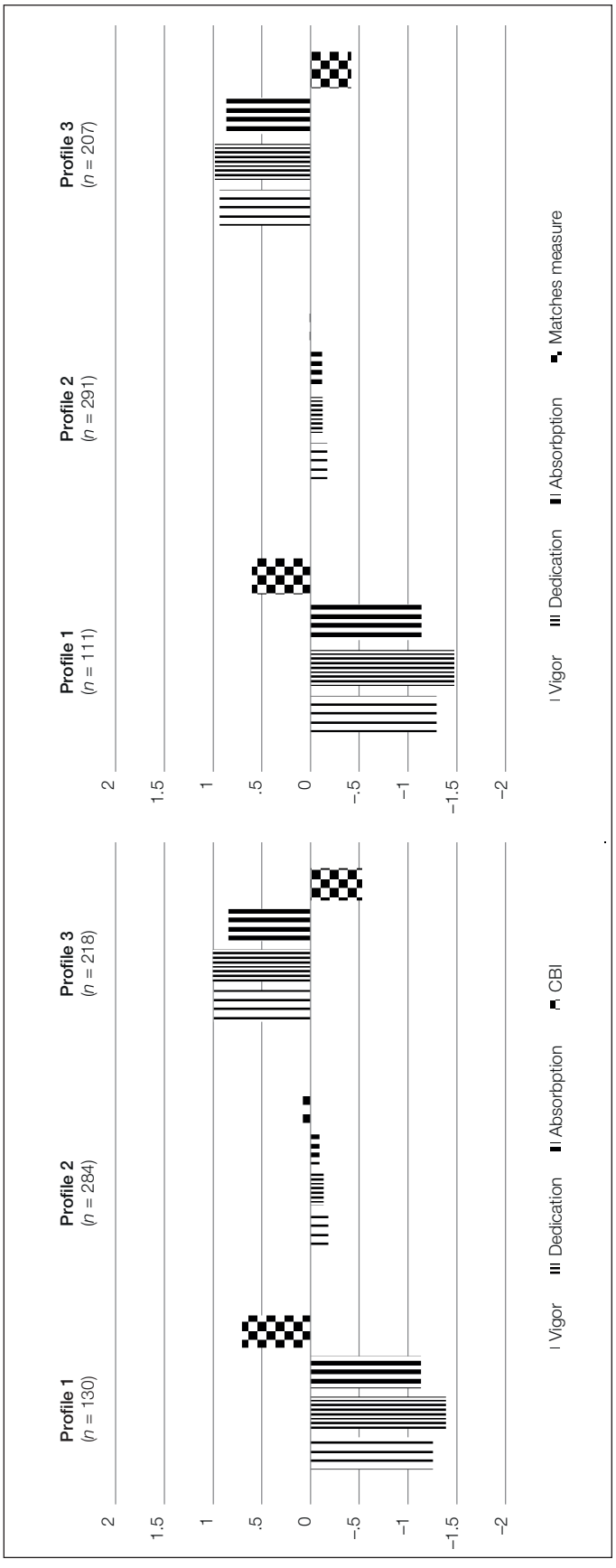
Note. n = 1241. Gender: 1 = Female, 0 = Male. Supervisor duties: 0 = No, 1 = Yes. Motivational, cognitive, emotional, and behavioral refer to the workaholism subscales. Reliability estimates – McDonald's omegas – are reported in parenthesis on the diagonal.
* $p<.05$; ** $p<.01$

Table 2 – Study 1: statistics for alternative profile solutions

Number of profiles	LL	FP	AIC	BIC	SABIC	Entropy	Smallest class %	LMR (*p*)	BLRT (*p*)
CBI: first half of the sample (n = 632)									
2	−3188.55	13	6403.10	6460.94	6419.67	.82	43%	<.001	<.001
3	**−3057.25**	**18**	**6150.49**	**6230.57**	**6173.43**	**.81**	**21%**	**.020**	**<.001**
4	−2983.10	23	6012.19	6114.52	6041.50	.82	7%	.093	<.001
5	−2959.18	28	5974.35	6098.92	6010.03	.80	6%	.318	<.001
6	−2952.01	33	5970.02	6116.83	6012.06	.84	<1%	.755	<.001
Matches: second half of the sample (n = 609)									
2	−3170.57	13	6367.14	6424.49	6383.22	.79	33%	<.001	<.001
3	**−3046.36**	**18**	**6128.72**	**6208.13**	**6150.99**	**.81**	**18%**	**<.001**	**<.001**
4	−2996.33	23	6038.67	6140.14	6067.12	.85	1%	.081	<.001
5	−2952.79	28	5961.57	6085.10	5996.21	.85	1%	.219	<.001
6	−2927.66	33	5921.32	6066.91	5962.14	.84	1%	.718	<.001

Legenda. LL = log−likelihood; FP = free parameters; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; SABIC = Sample−size Adjusted Bayesian Information Criterion; LMR = *Lo−Mendell−Rubin Test*; BLRT = *Bootstrapped Likelihood Ratio Test.*
Note. Boldface indicates selected models.

Figure 1 – Study 1: visual representation of burnout-work engagement profiles using different burnout measures



Note. For a clear interpretation of which indicator values are above or below the sample means, we used the *z*-standardized mean scale scores. The figure on the left depicts the profiles emerged using the CBI, the figure on the right depicts the profiles emerged using the Matches scale.

dimensions and high burnout. Profile 2 was characterized by average levels across all variables, representing employees maintaining a neutral stance towards work (Leiter & Maslach, 2016). Profile 3 displayed high levels of all work engagement dimensions and low levels of burnout. Notably, although not identical, the solutions obtained using the two scales are very similar, supporting Hypothesis 2.

Table 3 shows within–profile standardized scores and univariate entropy values, highlighting vigor and dedication as key class indicators, with burnout providing approximately the same amount of information about latent profiles across the two measures. Overall, using a variable– and a person–centered approach, these results provide evidence for the convergent and discriminant validity of the Matches measure.

Criterion validity

As reported in Table 1, the correlations of the Matches measure with workaholism and performance outcomes were similar in magnitude to estimates obtained using the CBI. Specifically, the Matches measure correlated significantly and positively with workaholism (r = .25; p<.001) and all its subdimensions and significantly and negatively with task (r = −.20; p<.001) and contextual performance (r = −.10; p = .001), supporting Hypothesis 3.

However, results from the person–centered approach showed some differences in how workaholism (including its subdimensions) and performance outcomes were distributed across the profiles estimated using the two different burnout scales, as shown in Table 4.

Specifically, significant differences emerged across profiles 2 *vs* 3 in the overall score of workaholism when using the Matches measure, while these were not evident with the CBI. Other differences in the subdimensions of workaholism emerged when using the two burnout measures (see Table 4). Also, significant differences emerged between profiles 1 *vs* 2 for task performance when using the Matches measure, whereas these were not detected using the CBI. Overall, these results provide partial support for Hypothesis 4.

Incremental validity

Results from hierarchical regression analyses (see Table 5) showed that the Matches measure displayed incremental validity over the CBI in predicting work engagement and task performance but not contextual performance. For all the outcomes considered, it should be noted that incremental validity estimates were rather small in magnitude. Together, these results support Hypothesis 6a and 6b, while Hypothesis 6c is rejected.

Differences across sociodemographic characteristics

Tables 5 to 8 display the results of burnout mean comparisons across demographic characteristics. Regarding gender and age, our results showed that the CBI detected gender differences that were not detected by the Matches measure (see Table 6), while for participants in different age groups, the two scales mapped differences that were not consistent. Similarly, inconsistencies in burnout scores using two different scales emerged when considering participants with a different number of kids (see Table 7) and in the context of remote working (see Table 8).

Test–retest reliability

Results from a correlation analysis with data from Study 2 yielded strong test–retest reliability of the Matches measure across time (M_{T1} = 3.34; SD_{T2} = 1.43; M_{T2} = 3.24; SD_{T2} = 1.64), r = .68; p<.001.

Predictive validity

Results from a hierarchical regression analysis showed that burnout, as assessed at the beginning of the workweek using the Matches measure, significantly negatively predicted self–reported health (M_{T2} = 3.62; SD_{T2} = .80) at the end of the workweek, β = −.35; p<.001, supporting Hypothesis 5.

DISCUSSION

This study aimed to investigate the validity of the Matches burnout scale (Zapata et al., 2022) within the Italian context. We assessed convergent, criterion, and incremental validity employing both variable– and person–oriented

Table 3 – Study 1: parameter estimates for the three–profile models

		CBI				Matches		
Variable	**Univariate entropy**	Profile 1	Profile 2	Profile 3	**Univariate entropy**	Profile 1	Profile 2	Profile 3
Latent profile membership proportions		21% (n = 130)	45% (n = 284)	34% (n = 218)		18% (n = 111)	48% (n = 291)	34% (n = 207)
		Within–profile z–standardized means				Within–profile z–standardized means		
Burnout	.15	.70	.08	–.53	.13	.70	.03	–.43
Vigor	.53	–1.25	–.18	.99	.50	–1.34	–.14	.89
Dedication	.64	–1.39	–.13	1.00	.65	–1.54	–.11	.96
Absorption	.35	–1.13	–.09	.84	.29	–1.14	–.12	.88

Note. For a clear interpretation of which indicator values are above or below the sample means, we used the z–standardized mean scale scores.

Table 4 – Study 1: descriptives of covariates and focal variables across profiles

	CBI (n = 632)						Matches (n = 609)					
	Profile 1 *vs* 2		Profile 1 *vs* 3		Profile 2 *vs* 3		Profile 1 *vs* 2		Profile 1 *vs* 3		Profile 2 *vs* 3	
Variable	χ^2	p	χ^2	p	χ^2	p	χ^2	p	χ^2	p	χ^2	p
Age	.12	.73	.74	.39	.37	.55	1.52	.22	.19	.66	.78	.38
Gender	2.51	.11	.65	.42	.74	.39	.37	.54	2.43	.12	1.82	.18
Workaholism	**5.27**	**.02**	**10.13**	**≤.001**	1.31	.25	**4.76**	**.03**	**21.71**	**≤.001**	**8.91**	**.01**
Motivational workaholism	.92	.34	3.29	.07	1.13	.29	.87	.35	**10.87**	**≤.001**	**8.20**	**≤.001**
Cognitive workaholism	**6.45**	**.01**	3.64	.06	.80	.37	.30	.58	**4.27**	**.04**	3.71	.05
Emotional workaholism	**5.55**	**.02**	**5.43**	**.02**	.01	.94	**14.23**	**≤.001**	**21.37**	**≤.001**	1.74	**.19**
Behavioral workaholism	**4.34**	**.04**	**13.82**	**≤.001**	**4.08**	**.04**	1.81	.18	**15.95**	**≤.001**	**10.18**	**≤.001**
Task performance	2.67	.10	**37.90**	**≤.001**	**39.46**	**≤.001**	**4.55**	**.03**	**32.58**	**≤.001**	**21.54**	**≤.001**
Contextual performance	**36.33**	**≤.001**	**140.81**	**≤.001**	**49.85**	**≤.001**	**26.40**	**≤.001**	**111.90**	**≤.001**	**45.96**	**≤.001**

Note. For all focal variables we used the z–standardized scores. Statistically significant differences are in bold.

Table 5 – Study 1: incremental validity analyses of matches measure relative to CBI

Criterion variable	Work engagement		Task performance		Contextual performance	
	Step 1	*Step 2*	*Step 1*	*Step 2*	*Step 1*	*Step 2*
	B	B	B	B	B	B
CBI	–.58***	–.47***	–.21***	–.15***	–.11***	–.09*
Matches		–.10***		–.06**		–.02
R^2	.18	.19	.04	.05	.01	.01
ΔR^2		.01***		.01**		–

Note. Unstandardized regression coefficients are reported.
* p<.05; ** p<.01; *** p<.001

approaches. Additionally, we examined test–retest reliability and predictive validity using two–wave data collected over a workweek. Finally, we explored sociodemographic differences in burnout assessments using the CBI and the Matches measure.

Convergent validity, assessed by comparing the Matches measure with the validated Italian version of the CBI, was upheld across both approaches. However, support for criterion validity varied depending on the approach adopted. Variable–centered analyses indicated comparable relations between the CBI and the Matches measure with variables in the nomological network of burnout, consistent with findings by Zapata and colleagues (2022).

In contrast, person–centered analyses revealed minimal disparities in how employees' profiles were linked with variables in the nomological network considered here. Specifically, our findings indicated that, concerning workaholism, the visual scale identified distinctions between the profile characterized by a neutral stance towards work and the profile representing engaged employees that were not discerned by the sentence–based scale. Additionally, for task performance exclusively, the visual scale identified significant differences between the profile representing employees with the lowest work engagement scores and those in the neutral stance group, which were not evident with the sentence–based scale. These results suggest that the visual scale may serve as a valuable tool for promptly identifying potential workaholism risks among employees with diverse profiles across the burnout–engagement continuum.

Our results also showed that the Matches measure demonstrated significant, albeit small, incremental validity over the CBI in predicting work engagement and task performance. Hence, it seems that using the burnout visual scale adds information regarding work engagement and task performance that cannot be obtained through the CBI alone. Together with results from the person–centered analysis on convergent validity, these findings show that the burnout visual scale maps relations between burnout and its nomological network differently compared to the CBI. That is, it may capture burnout facets that instill mechanisms at risk of going unnoticed when using the CBI alone.

The Matches measure demonstrated robust test–retest

Table 6 – Study 1: gender and age differences in burnout scales

Measure	Women N_{CBI} = 725 N_{Visual} = 674		Men N_{CBI} = 518 N_{Visual} = 484		t_{CBI} (1241) t_{Visual} (1156)	19 – 29 years old N_{CBI} = 395 N_{Visual} = 366		30 – 39 years old N_{CBI} = 193 N_{Visual} = 177		40 – 49 years old N_{CBI} = 174 N_{Visual} = 166		50 – 59 years old N_{CBI} = 407 N_{Visual} = 381		60 – 68 years old N_{CBI} = 89 N_{Visual} = 80		F_{CBI} (4, 1257) F_{Visual} (4, 1169)
	M	*SD*	*M*	*SD*		*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
CBI	2.63	.87	2.50	.84	2.759**	2.72^{ab}	.84	2.59	.87	2.60	.86	2.49^{a}	.88	2.36^{b}	.83	5.08***
Matches	3.23	1.67	3.12	1.65	1.163	3.19	1.63	3.31^{c}	1.76	3.30^{d}	1.72	3.24^{e}	1.69	2.64^{cde}	1.39	2.67*

Note. ^{abcde} = The same subscript denotes significant differences between the identified groups using Bonferroni test, at $p<.05$.
* $p<.05$; ** $p<.01$; *** $p<.001$

Table 7 – Study 1: differences across people with a different number of kids

Measure	No kids N_{CBI} = 670 N_{Visual} = 617		1 kid N_{CBI} = 174 N_{Visual} = 166		2 kids N_{CBI} = 306 N_{Visual} = 288		3 kids N_{CBI} = 89 N_{Visual} = 82		4 kids N_{CBI} = 14 N_{Visual} = 12		5 kids N_{CBI} = 5 N_{Visual} = 5		F_{CBI} (5, 1257) F_{Visual} (5, 1169)
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	
CBI	2.69^{abc}	.84	2.46^{a}	.80	2.48^{b}	.94	2.39^{c}	.83	2.62	.73	2.00	1.01	4.963***
Matches	3.26	1.68	3.20	1.63	3.13	1.64	3.05	1.82	3.33	1.97	2.80	1.92	.456

Note. ^{abc} = The same subscript denotes significant differences between the identified groups using Bonferroni test, at $p<.05$.
*** $p<.001$

Table 8 – Study 1: differences considering remote working in the last month (yes/no)

Measure	No remote working N_{CBI} = 816 N_{Visual} = 756		Remote working N_{CBI} = 442 N_{Visual} = 414		t_{CBI} (1256) t_{Visual} (1168)
	M	*SD*	*M*	*SD*	
CBI	2.62	.90	2.51	.79	2.016*
Burnout visual	3.21	1.68	3.19	1.66	.237

Note. Remote working coded as a dummy variable. The presence of remote working indicates at least one day of remote working in the last month.
* $p<.05$

reliability across two time points, affirming its consistency as a measure of burnout. Furthermore, it exhibited significant predictive validity by accurately forecasting self–rated health assessed at a subsequent time point. These findings underscore the Matches measure's efficacy as a valid tool for assessing the risk of health impairment stemming from burnout.

When examining whether the performance of the Matches measure was similar to that of the CBI in detecting sociodemographic differences in burnout, we observed inconsistent mappings between the two scales. These discrepancies could be attributed to varying interpretations of the content of the items, more pronounced with the CBI, or to the different cognitive effort required by each measure, resulting in divergent responses from individuals with different characteristics. To better understand these findings, we conducted additional analyses to check if gender and age moderated the relationships between the different measures of burnout and the outcomes considered for incremental validity. Results showed that all but one effect were not significant. The only significant moderation found was that of age moderating the link between the CBI and cognitive workaholism (B = .008, $p<.001$). A simple slope analysis showed that the interaction was significant for all age levels (–1*SD*, B = .30; $p<.001$), with a positive relation becoming steeper for older individuals (+1*SD*, B = .54; $p<.001$).

Hence, our findings suggest that the choice of burnout measurement tool may influence the detection of sociodemographic variations. However, it is important to note that research investigating demographic variables in relation to burnout is relatively limited, with inconsistent findings (Maslach & Leiter, 2008; Schaufeli & Enzmann, 1998). Therefore, further studies are warranted to gain a deeper understanding of the nuances associated with burnout based on sociodemographic characteristics.

Limitations and future directions

In this research, leveraging the literature recognizing exhaustion as a central aspect of burnout (Bakker et al., 2014) and a consistent dimension across various conceptualizations

(Zapata et al., 2022), we compared the Matches measure with the CBI, which also emphasizes fatigue and exhaustion. Consequently, our conclusions are confined to the Matches measure's capacity to capture exhaustion, and we cannot extrapolate its performance regarding other facets of burnout (e.g., cynicism, professional efficacy) among Italian employees. However, initial evidence from the U.S. supports measurement equivalence at the facet level also for cynicism and professional efficacy, which, coupled with the fact that our results for exhaustion are similar in magnitude to the ones from the U.S., is promising. Future research conducted in Italy could explore how the Matches measure performs in assessing other constituting dimensions of burnout.

In testing test–retest reliability, we used two–wave data collected across a workweek. While these data are valuable in shedding light on the psychometric properties of the Matches scale, we acknowledge that this time frame is relatively short. Future research could examine the validity of the Matches measure over a longer time span.

CONCLUSION

Overall, our findings suggest that the burnout visual scale can also be used in Italy to obtain a valid and reliable burnout assessment that aligns, concerning work–related variables, with an existing validated measure of burnout, i.e., the CBI. Moreover, adding the visual scale to assess burnout may hold value in mapping psychological mechanisms involved in burnout that are not captured by the Italian version of the CBI. This has implications for both research and applied contexts. The use of the visual burnout scale can mitigate participant fatigue during data collection, enhance participant comprehension, and reduce the need for translating emotions into words (Zapata et al., 2022). These advantages also extend to practitioners willing to assess burnout levels or burnout–related risks and outcomes, who can benefit from a quick and easy–to–use tool that can be adopted for coaching, training sessions, or psychosocial risk assessment.

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Development and preliminary validation of the Job Digital Competence Scale

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ABSTRACT. Lo studio descrive la costruzione e la validazione preliminare della *Job Digital Competence Scale,* basata sul modello DigComp 2.2, per valutare le competenze digitali sul lavoro. Gli item sono stati sviluppati tramite revisione della letteratura, interviste a esperti e valutazioni di giudici. La scala è stata testata su 214 partecipanti di vari settori, confermando la natura multidimensionale del costrutto, con un'affidabilità e validità accettabili e correlazioni da moderate a forti con variabili tecnologiche e di performance. Lo strumento risulta breve e adatto a valutare competenze digitali in ambito organizzativo.

SUMMARY. This study describes the development and preliminary validation of the Job Digital Competence Scale, a measure based on the DigComp 2.2 model for the assessment of digital competences in the workplace. Items were created and refined following a literature review, interviews with experts, and a judge evaluation. The psychometric properties of the tool were tested through a study involving 214 participants from various occupational sectors. Results confirmed the multidimensional nature of the construct, with acceptable reliability (omega ranging from .69 to .93) and moderate to strong correlations with technology acceptance, performance, and the use of different digital systems. Results of the preliminary validation suggest that the Job Digital Competence Scale is a reliable and relatively brief tool to assess different dimensions of digital competence in the general working population.

Keywords: *Digital competence, Digcomp 2.2, Job performance, Digital systems, Scale validation, Multiple imputation*

INTRODUCTION

ICTs have steadily improved and become more accessible in different work settings in recent years, changing how people interact with digital systems and the way work is designed (Parker & Grote, 2022). Digital competences, extending beyond technical expertise to include learning readiness and problem-solving, play a crucial role in organisational digital transformation by allowing the adoption of innovative digital systems that can be expertly used by workers, improving work quality and performance (Trenerry et al., 2021).

Among the proposed models to investigate digital competence (DC), the European Digital Competence Framework for Citizens, or DigComp is one of the most

comprehensive and utilized frameworks (Oberländer, Beinicke & Bipp, 2020; Peiffer, Schmidt, Ellwart & Ulfert, 2020); first proposed in 2013 (Ferrari, 2013) it is currently in its third revision, Digcomp 2.2 (Vuorikari, Kluzer & Punie, 2022). The framework is based on a KSA (Knowledge, Skills, Attitude) conceptualisation of competence and refers to DC as a multidimensional construct, defined as "the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society" (European Commission, p. 10). The model is composed of 21 competences distributed in five areas: Information and Data Literacy (IDL), Communication and Collaboration (CC), Digital Content Creation (DCC), Safety (S) and Problem Solving (PS).

Despite this comprehensive conceptualization and the interest in assessing DC, research on the working population is limited, with an even more limited choice of tools to evaluate digital competencies in the general workforce, since most of them are aimed at the educational sector (Oberländer et al., 2020). There are many conceptualizations of digital proficiency, and as such some instruments do not measure digital competence (Ulfert-Blank & Schmidt, 2022) or are based on a different theoretical model (Nikou, De Reuver & Mahboob Kanafi, 2022). Other instruments are based on DigComp (Bartolomé, Garaizar & Larrucea, 2022; Clifford, Kluzer, Troia, Jakobsone & Zandbergs, 2020) but they are either too lengthy for organisational research and practice or measure only some of DigComp dimensions (Oberländer & Bipp, 2022). Lastly, some tools are developed for a specific working population (i.e., Reixach et al., 2022).

In light of this context, this study aims to bridge this gap in the literature, presenting the development and the preliminary validation study of the *Job Digital Competence Scale (JDCS)*, a brief self-report tool based on Digcomp 2.2 aimed at the general workforce.

METHOD

We followed the three main steps in the literature for scale development (Morgado, Meireles, Neves, Amaral & Ferreira, 2017): item generation, theoretical analysis, and psychometric analysis. The item generation involved a deductive step (systematic review), which resulted in 125 items, and an inductive step (interviews with experts), after which we refined the items and reduced their number to 61. Items were formulated without reference to specific digital systems, to avoid obsolescence and engage the general working population.

Following this step we further refined the items by conducting a survey with expert judges, resulting in the final set of items ($n = 21$) included in a study to test the instruments' psychometric properties.

Item generation

In the first step, we conducted a systematic review of DigComp-based instruments used in studies published since 2013 involving the working population, by performing two searches on Scopus and Web of Science in January 2023. The review was aimed at understanding how DC was operationalized and examining the characteristics of the tools used to assess it in the working population.

Following this analysis, we conducted semi-structured interviews between February and March 2023 involving nine experts in the field of technology at work. We asked the experts to express their beliefs on the following themes concerning DC for the general working population:

- essential DC required for workers;
- most important DC in the workplace;
- commonly lacking DC among workers;
- DC requiring future investment and development.

The interviews aimed at identifying the level and type of competences needed in the labour market today for a wide range of occupations, to prepare items that could adequately discriminate between participants of different proficiency levels, from the most basic areas to slightly more advanced competences, without being too easy or too technical to understand.

To better capture the wide range of DC in different work contexts and hierarchical levels, we aimed to obtain a heterogeneous sample in terms of age, work sector, and job position. Participants' mean age was 44.45 ($SD = 14.19$), most of whom were males ($n = 7$). Four participants were employed in the research, teaching, and training sector, while the remaining three were employed in IT.

The interviews were analyzed through template analysis (King, 1998), using the paragraph as the analysis unit. A priori themes derived from the areas and single competences described in the DigComp 2.2 were used as an initial template. The five dimensions of the model were used as superordinate

families, with each competence serving as a separate code. Following the first coding, the interviews were analyzed again to further refine the codes and find potential new themes, resulting in additional subthemes for each competence.

Theoretical analysis

To assess the face and content validity of the scale, we presented it to seven judges. The sample was composed of four females and three males, with a mean age of 32.3 years (*SD* = 10.10). Four of the judges were employed in the teaching and research sector and thus considered experts in the target construct while the remaining three were technical profiles using ICT for daily work. Judges rated wording clarity and item relevance on a scale from 1 = not at all to 5 = very much and categorized the items as knowledge, skills, or attitude to ensure greater content validity. For item selection, we used the sum score decision rule (total score for an item for clarity and relevance across all judges; Hardesty & Bearden, 2004), retaining only items scoring 52 or higher (range: 14-70) and with a concordance of at least four out of seven judges. Subsequently, we selected the highest-rated items and checked their relevance with the interview themes, resulting in the final set of 22 items.

Psychometric analysis

Participants and procedure

The JDCS was included in an online questionnaire hosted on the Limesurvey platform. Data collection took place between July and October 2023. Participants were recruited through a research invitation disseminated through social networks, which included a brief description of the study and the survey link. Informed consent was collected from all participants on the first page of the survey, which also presented the research and the data management policy in further detail. The anonymous and voluntary participation and the right to withdraw from the study at any time with no consequences were also emphasized. The Bioethical Committee of the University of Turin approved the study (document no. 0558878, July 18, 2023).

The sample included 214 participants. Mean age was 38.39 years (*SD* = 12.46), ranging from 18 to 67 years. The sample was quite balanced concerning gender, with a slight majority of women (53.4%). Most of the sample was employed as an office worker (63.7%), followed by factory workers (18.1%), middle managers (12.9%) and executives (4.1%). Most of the sample worked in the private sector (80.6%), full-time (86.4%), with a permanent contract (64.9%); 16.3% had a fixed-term contract, while 10.1% defined themselves as freelancers. Finally, average job seniority was 11.47 years (*SD* = 11.50).

Measures

The JDCS consisted of 22 items answered on a 7-point Likert scale. The questionnaire included additional measures to test the instruments' convergent validity.

Organizational digital culture was assessed with three items (e.g. "There is a clear orientation to digital technology changes inside the company's culture") adapted from Martínez-Caro and colleagues (Martínez-Caro, Cegarra-Navarro & Alfonso-Ruiz, 2020). Participants were asked to answer on a 7-point Likert scale. McDonald's Omega was .90.

Task performance was assessed with the Italian version of the *Individual Work Performance Questionnaire* (Casu, Mariani, Chiesa, Guglielmi & Gremigni, 2021). Only the 5 items about task performance were used in this study (e.g. "I was able to perform my work well with minimal time and effort"). To reduce the possibility of response sets and socially desirable answers, the authors added 3 reverse items, with one referring to the perceived quality of one's work, an aspect that was missing from the original scale ("The quality of my work was not always up to the demands"). Participants were asked to indicate the frequency of eight statements on a scale from 0 = rarely to 4 = always. McDonald's Omega was .81.

Technology acceptance was assessed with eight items six of which were adapted from the TAM-3 (e.g. "The system improves my performance in my job"; Venkatesh & Bala, 2008). Three items measured perceived usefulness, three perceived ease of use, and two more items, one of which reversed ("Given the choice, I would reduce the use of digital systems at work"), were added by the authors to assess behavioural intention, following the formulation from Rojas-Osorio and Alvarez-Risco's instrument (2019). Participants answered on a 5-point Likert scale. McDonald's Omega was .92.

The frequency of use of digital systems was measured with eight ad hoc items. Each item was dedicated to one

of the following digital technologies or services: e-mails; internet to search for information; spreadsheet programs; online conferencing or chats; word processing programs; programming languages; social networks; and artificial intelligence. Participants indicated the frequency of use of each item on a scale from 1 to 5 (1 = never, 2 = less frequently than once a month, 3 = at least once a month, 4 = at least once a week, 5 = daily).

Data analysis

We conducted Little's MCAR Test, which was significant (χ^2 = 4681.18, *df* = 4447, *p* = .007). Multiple imputation was performed in R using the package *mice,* employing the predictive mean matching method (10 imputations, 5 iterations). Kolmogorov-Smirnov and Shapiro-Wilk tests confirmed non-normality for every JDCS item. Kaiser-Meyer-Olkin (KMO) test yielded values greater than .80, and Bartlett's test of sphericity was non-significant. Confirmatory factor analysis (CFA) was performed in R using the packages *semTools* and *lavaan*, employing a Weighted Least Square Mean and Variance adjusted (WLSMV) estimator.

Consistent with the literature, we evaluated several fit indices: the χ^2 index, Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Standardized Root Mean Square Residual (SRMR). We considered the following cut-off values: >.95 for CFI, <.08 for both RMSEA and SRMR (Hooper, Coughlan & Mullen, 2008). Composite reliability and convergent validity were assessed by calculating McDonald's omega and average variance extracted (AVE), respectively. After confirming the scale's factorial structure we conducted correlation analyses using the mean scores of the JDCS dimensions and technological variables to further assess convergent validity. Performance, being theoretically linked to competence and paramount in the relationship between DC and workplace digital transformations, was also included in the analyses. Reported results are pooled estimates across 10 imputed datasets.

Literature review

The literature search yielded 441 sources, which after further rounds of analysis and selection resulted in 16 studies, most of which (*n* = 12) were in the educational sector; only two studies included a general workforce sample. The construct was predominantly described as multidimensional, although there was disagreement concerning the number of dimensions; furthermore, almost half of the studies that intended DC as multidimensional opted to present a general competence score, thus treating the construct as one-dimensional. Ten sources included a relatively short tool suitable for our objective, ranging from 19 to 29 items; however, six were based on DigCompEdu and four of them specifically employed the same instrument. Of the remaining four not using this framework, one tool was specifically developed for the healthcare sector, two lacked adequate psychometric properties, and one measured digital self-efficacy, although the tool was quite robust concerning sampling and psychometric properties and presented minimal differences with the conceptualization of digital competence. Since most of the shorter tools employed the same instrument based on the DigCompEdu, the most common response scale was a proficiency scale ranging from zero to four; the other studies all employed different ones, with three employing an agreement scale.

After reviewing the instruments included in the studies, we cross-checked the item formulations with the examples provided in DigComp 2.2 and the DigCompSat assessment instrument, resulting in the first set of items (*n* = 125).

Interviews

Participants depicted the digitally competent worker as someone who is relatively autonomous in the use of digital systems to perform basic navigation for searching information and solutions, manage data, develop content, communicate and collaborate with others, and solve simple technical problems. Concerning higher levels of specialization or more technical occupations, participants highlighted being able to apply the fundamentals of computational thinking and perform some light task automation, with higher proficiency in navigating digital systems to find the best answers and apply them creatively. Competences perceived as lacking and important for the future were almost always equivalent, namely communication and collaboration, data management, and identifying needs and answers autonomously. Although competences concerning copyright, well-being, and

environment were almost never cited by participants, we still included them in the set of items resulting from the analysis (n = 61)

Expert evaluation

46 items out of 61 obtained a summed score of at least 52. One item was eliminated since it did not reach the minimum agreement of four judges, leaving 45 items for further evaluation. After choosing the best-rated items for each competence, the number of items was further reduced to 38. Finally, we checked which items aligned best with the results of the interviews. Items regarding citizenship, personal health, and the environment were not prominent in the interviews and additionally did not pass the sum score cut-off, so we excluded them. On the other hand, an item concerning copyright, a theme which was never mentioned, had high scores and agreement ratio, and thus we included it. Another item concerning data analysis and decision making, a competence that was often cited as important for the future, was slightly below the cut-off score but we decided to keep it. The relatively lower score resulted from one of the judges not answering the question: the other judges assigned acceptable scores both in clarity (M = 4.67) and congruence (M = 3.5). The final scale consisted of 22 items, at least one for each competence for which the items passed the sum score cut-off; Table A1 in the Appendix reports the original Italian formulations and corresponding English translation, with the items numbered according to the DigComp 2.2 competence area (first number) and single competence (second number).

Psychometric analysis

We employed a CFA to test the dimensionality of the scale. We tested the following models: a *g*-factor model, where all items directly load on a general DC factor (M1); a higher-order model, where the five factors following the five competence areas described in the DigComp 2.2 model load on a general factor (M2); a first-order correlated factor model (M3).

The following residuals covariance were specified in each model according to thematic relations: 4.2 with 4.3, since one refers to general cybersecurity threats and one mentions phishing; 3.1a with 3.2, since creating and editing digital content are closely related. Results showed that M1 did not have satisfactory fit statistics, in line with the multidimensionality of the construct. Conversely, M2 had an acceptable fit, with only CFI having a value below the suggested cut-off of .96, but resulted in a Heywood case, possibly due to the small sample size. Finally, M3 presented a marginally better fit, with a significant χ^2 difference test, and thus was the preferred model (see Table 1)

Table 1 – Structural models of the JDCS with robust fit indices

	χ^2	*df*	CFI	RMSEA	SRMR	$\Delta\chi^2$	Δdf	*p*
M1	842.87	209	.89	.12 [.12;.13]	.10			
M2	477.64	202	.95	.08 [.07;.09]	.07	428.79	5	<.001
M3	457.62	197	.96	.08 [.07; .09]	.07	20.02	5	.001

Legenda. df = degree of freedom; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual.

Note. Robust indices pooled across 10 imputations.

The fully standardized factor loadings (see Table 2) ranged from .50 to .92, indicating that the factors and the variables are sufficiently related. Composite reliability is higher than .60 (Hair et al., 2014) for all variables. For what concerns AVE, all factors exceed the threshold of .50 (Fornell & Lacker, 1981), suggesting a good convergent validity, except for IDL (see Table 3).

After assessing the factorial structure of the scale, we computed composite scores by averaging the manifest variables. The scale means were all above the central point of the scale, with CC having the largest mean. Standard deviations indicate a moderate dispersion, showing sufficient variation in scores among the sample (see Table 4).

To assess the convergent validity of the construct, we conducted correlations between the single dimensions of DC, three ICT-related variables, performance, age and gender (see Table 5).

DISCUSSION

Concerning technological variables, organizational digital culture and technology acceptance were positively related to DC, with the latter showing stronger effects. Correlations with the frequency of use were all positive and significant, with a few exceptions. Social network use was correlated only with IDL and CC, and in a similar way conferencing/chat was not related to Safety and Problem Solving. Considering that these dimensions refer to a finer understanding of digital systems, compared to more basic competence domains like IDL, it is not surprising that they show stronger correlations with more advanced aspects of DC.

Referring to demographic variables, as expected age is negatively correlated with all dimensions of DC, except IDL. Being female is negatively correlated with all dimensions, except CC. Effect sizes are smaller compared to the relationships with the technological variables, although the correlations between age and problem solving and especially gender and safety show comparatively higher coefficients.

CONCLUSIONS

The results of this preliminary validation show that the JDCS possess adequate psychometric properties, in terms of internal consistency, reliability, and convergent validity. Specifically, results support the multidimensional nature of the underlying construct, reproducing the five factors of the DigComp framework. However, it must be noted that the first dimension showed worse psychometric properties, which should be investigated more in-depth in further research. The pattern of correlation showed that the frequency of use of more sophisticated digital systems is correlated with the last two dimensions of DigComp, Safety and Problem Solving, which not only refer to more complex aspects of digital technology but are also considered more transversal competences areas.

Overall, the JDCS appeared to fill the gap in the literature for a relatively brief, context-free self-report measure of DC for the general working population. The scale could be employed for large-scale assessment, as well as training and vocational guidance, to contribute to the systematic self-assessment of DC from a development perspective. Furthermore, due to the multidimensional structure, single dimensions could be used to investigate specific facets of technology use at work, especially considering that different occupational groups could require different sets of DC.

In order to overcome the preliminary nature of this study, further research must: a) involve a larger and even more diverse population, to support the tool's generalizability and test its invariance; b) include variables to further assess criterion and divergent validity; c) test the predictive power of DC with longitudinal designs, taking into account dependent variables like performance, satisfaction and engagement, but also controlling for organisational culture dimensions. Taken together, these developments may help identify the most effective strategies for improving DC, given the centrality of human capital in supporting digital transformation in organisations.

Table 2 – Fully standardized factor loadings for each competence area

	IDL	CC	DCC	S	PS
1.1	.71				
1.2	.60				
1.3	.65				
2.1		.84			
2.2		.86			
2.4a		.85			
2.4b		.79			
2.5		.75			
2.6		.50			
3.1a			.78		
3.1b			.81		
3.2			.76		
3.3			.66		
3.4			.84		
4.1				.83	
4.2				.75	
4.3				.66	
5.1					.80
5.2a					.92
5.2b					.83
5.3					.85
5.4					.84

Legenda. IDL = Information and Data Literacy; CC = Communication and Collaboration; DCC = Digital Content Creation; S = Safety; PS = Problem Solving.

Note. All loadings were significant at $p<.001$.

Table 3 – Composite reliability and AVE for the five factors

	OMEGA	AVE
IDL	.69	.43
CC	.90	.60
DCC	.88	.59
S	.79	.56
PS	.93	.72
Full scale	.97	.60

Legenda. AVE = average variance extracted; IDL = Information and Data Literacy; CC = Communication and Collaboration; DCC = Digital Content Creation; S = Safety; PS = Problem Solving.

Note. Calculations are done on pooled estimates.

Table 4 – Pooled means and standard deviations of the manifest scales scores

	M	*SD*
IDL	4.73	1.37
CC	5.19	1.23
DCC	4.60	1.43
S	4.01	1.68
PS	4.25	1.62
Full scale	4.63	1.20

Legenda. IDL = Information and Data Literacy; CC = Communication and Collaboration; DCC = Digital Content Creation; S = Safety; PS = Problem Solving.

Table 5 – Correlations among JDCS dimensions and study variables (pooled estimates)

	IDL	CC	DCC	S	PS
Age	.02	−.16*	−.15*	−.04	−.20**
Gender (1=F)	−.16*	−.02	−.15*	−.27**	−.19*
Performance	.11	.24**	.14*	−.04	.08
Organizational digital culture	.16*	.24**	.22**	.18*	.24**
Technology acceptance	.29***	**.53*** **	**.44*** **	**.30*** **	**.50*** **
Frequency of use:					
Mail	.28***	.25**	.23**	.16*	.20**
Internet	.26***	.28***	.21**	.06	.14*
Spreadsheets	.28***	.28***	**.33*** **	.24**	.25***
Conferencing/chat	.21**	**.30*** **	.17*	.10	.13
Word processing	**.33*** **	**.35*** **	**.35*** **	.20**	.24**
Programming languages	**.36*** **	.23**	**.33*** **	**.37*** **	**.41*** **
Social network	.19***	**.35*** **	.12	.01	.13
Artificial intelligence	.24**	**.31*** **	.28***	**.31*** **	**.31*** **

Legenda. IDL = Information and Data Literacy; CC = Communication and Collaboration; DCC = Digital Content Creation; S = Safety; PS = Problem Solving.

Note. * $p<.05$; ** $p<.01$; *** $p<.001$. Effects ≥|.30| are reported in bold.

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APPENDIX

Table A1 – JDCS items in English and Italian

ID	English	Italian
1.1	I understand the factors that can influence the results of an online search	Conosco i fattori che possono influenzare una ricerca online
1.2	When I search for information online, I always check more than one source	Quando cerco un'informazione online consulto sempre più di una fonte
1.3	I know how to use data analysis software to make decisions and solve problems at work	So utilizzare software di analisi dati per prendere decisioni e risolvere problemi durante la mia attività lavorativa
2.1	I know how to use various advanced functions in video conferencing tools	So utilizzare una serie di funzioni avanzate degli strumenti di videoconferenza
2.2	I know how to use online services to share digital content with my colleagues	So utilizzare servizi online per condividere contenuti digitali con le persone con cui lavoro
2.4a	I am familiar with the main digital services that facilitate collaboration with my colleagues	Conosco i principali servizi digitali che facilitano la collaborazione con le persone con cui lavoro
2.4b	I know how to use digital services to plan my work activities with other people	So utilizzare servizi digitali per pianificare le mie attività lavorative insieme ad altre persone
2.5	I can evaluate the appropriateness of digital communication	So valutare l'adeguatezza di una comunicazione digitale
2.6	I maintain a consistent professional digital identity across all digital platforms I use	Mantengo un'identità digitale professionale coerente in tutte le piattaforme digitali che utilizzo
3.1a	I know how to use digital content creation tools, such as text editors or spreadsheets, to support my work activities	So utilizzare strumenti di creazione di contenuti digitali, come editor di testo o fogli di calcolo, per supportare la mia attività lavorativa
3.1b	I am highly proficient in specific software required for my work	Ho un'ottima padronanza dei software specifici necessari per la mia attività lavorativa
3.2	I can edit digital content created by others to adapt it to my needs	So modificare contenuti digitali creati da altre persone per adattarli alle mie esigenze
3.3	I am familiar with copyright law regarding digital content	Conosco la normativa del diritto d'autore rispetto ai contenuti digitali
3.4	I understand the logical foundations of how digital technologies work	Conosco i fondamenti logici che regolano il funzionamento delle tecnologie digitali
4.1	I can adjust the settings of a firewall	So modificare le impostazioni di un firewall
4.2	I am familiar with the main cyber security threats	Conosco le principali minacce per la sicurezza informatica
4.3	I know how to recognize phishing attempts	So riconoscere i tentativi di phishing
5.1	I can troubleshoot the operating system of my devices independently	So risolvere autonomamente problemi relativi al sistema operativo dei miei dispositivi

continued on next page

continued

ID	English	Italian
5.2a	I know how to choose different digital solutions to complete my work tasks more efficiently	So scegliere diverse soluzioni digitali per portare a termine i miei compiti lavorativi in modo più efficace
5.2b	I know how to adjust the setting of a software to fit my work needs	So modificare le impostazioni di un programma per adattarlo alle mie esigenze lavorative
5.3	I enjoy using digital technologies to creatively solve my work problems	Mi piace utilizzare le tecnologie digitali per risolvere in modo creativo i miei problemi lavorativi
5.4	I continuously develop my digital competences	Sviluppo in modo continuativo le mie competenze digitali

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Study of effectiveness of NUMO application in lowering ADHD symptoms in adults

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ABSTRACT. Lo studio analizza l'efficacia dell'applicazione NUMO nel ridurre i sintomi dell'ADHD negli adulti. La ricerca ha coinvolto 87 partecipanti, divisi in due gruppi in base all'intensità d'uso dell'app. Dopo tre mesi, il gruppo ad alta intensità ha mostrato miglioramenti significativi nei sintomi di disattenzione e iperattività, oltre a un aumento della qualità della vita. Anche il gruppo a bassa intensità ha dimostrato alcuni miglioramenti, che però sono stati significativamente minori. I risultati suggeriscono che l'app NUMO, usata intensamente, può essere uno strumento utile per la gestione dell'ADHD, sia come supporto di interventi psicoterapeutici, che come uno strumento a sé stante.

SUMMARY. Low executive functioning in people with ADHD leads to poor adaptation (Barkley, 1997). These deficits not only affect academic and occupational performance but also interfere with therapeutic interventions, for example, creating difficulties in doing homework in psychotherapy that itself aims to improve executive functions (Safren et al., 2005). An app that offers evidence-based exercises could potentially ease cognitive behavioural therapy (CBT) homework and/or be an autonomous top-bottom tool (Baumel et al., 2019). One such app is NUMO, which integrates psychoeducation, task management, and cognitive exercises designed to address ADHD symptoms This study checked the effectiveness of NUMO app in lowering ADHD symptoms and increasing the quality of life. 87 participants between 25 and 45 years of age were initially included in this study. All of them were previously diagnosed with ADHD and had never used NUMO before. The exclusion criteria were addictions and schizophrenia/psychosis. It was decided to run a quasi-experiment, that permitted to follow the natural behavioural patterns of the participants. 53 of them were therefore analyzed as the high-intensity group and 10 as the low-intensity group. Some others were excluded as they did not follow any constant pattern of interaction with the app or dropped-out. There is a need to mention that the participants were motivated to continue the interaction with NUMO by a gift certificate they received after this 3 month. There were used paired samples t-tests to compare pre- and post-experimental results in Conners (Conners Adult ADHD Rating Scales – CAARS) screening form and questions regarding the quality of life. The significant difference in every Conners screening form scale and the questions on quality of life was found in the results of the high-intensity group before and after using NUMO for 3 months. Meanwhile, the low-intensity group that used NUMO occasionally and with low-intensity showed some dynamics, but it was less significant. NUMO application is effective in lowering ADHD symptoms and improving the quality of life in adult people with ADHD. However, the findings suggest that continuous engagement with the app is necessary to achieve optimal results, consistent with the notion that sustained and intence interventions are needed to drive neuroplastic changes and lasting behavioral improvements (Kazdin, 2017).

Keywords: *ADHD, app NUMO, quality of life, behavioral improvements*

INTRODUCTION

ADHD is a neurodevelopmental condition characterized by persistent inattention, hyperactivity, and impulsivity, which significantly impair daily functioning. Executive functioning such as planning and self-regulation, is particularly affected in individuals with ADHD. These deficits can result in poor adaptation, making it difficult for individuals to organize tasks, manage time, or regulate their emotions effectively. ADHD persists in 70% of adults who have been diagnosed during childhood (Wilens, Biederman & Spencer, 2002). Moreover, the remaining 30% normally show some symptoms but do not fulfil the diagnostic criteria. The prevalence of ADHD is between 2 and 5% of the adult population (Barkley, 2006). The impulsivity and hyperactivity symptoms tend to diminish while inattention tends to remain constant during the lifespan. The difficulties in concentration and self-organization represent a serious problem for an individual's work and personal life. Adults with ADHD have lower income in average, which is partly related to a lower education level (they fail to complete studies) (Biederman & Faraone, 2005) and to a tendency to fail to complete tasks, disorganization in the working process, poor attention that led to poor work performance (Kessler et al., 2005).

A multimodal approach that includes not only medication, but psychotherapy and behavioural coaching/mentoring is preferable in the treatment of ADHD. The top-bottom approach is extremely helpful to individuals with ADHD, helping them to learn strategies that lead to more productive behaviour and better adaptation. However, the impairment in executive functions can also extend into the realm of therapeutic interventions. For example, cognitive behavioural therapy (CBT) usually includes homework assignments designed to build self-organization skills. However, individuals with ADHD may struggle to complete CBT homework due to their inherent difficulties with executive functioning, leading to luck of generalization and poorer therapy outcomes (Barkley, 2014; Antshel, Faraone & Hartsough, 2011).

Recently, the integration mobile health applications into psychotherapy has shown promise in addressing some of these problems. These tools can offer evidence-based exercises and strategies that promote skill-building in executive functioning while alleviating some of the practical challenges associated with traditional therapy formats (Torous, Rosenbaum & Wykes, 2018). One such tool, the NUMO application, is designed to help building new skills and support CBT protocols by providing interactive exercises. NUMO aims at improving organization and emotional regulation, lowering distractibility. The app is designed not only as a homework aid but also as an autonomous intervention tool, for example for individuals who may not have access to psychotherapy.

The study aims to evaluate the effectiveness of the NUMO application in reducing ADHD symptoms and improving the quality of life in adults. Mobile applications designed for ADHD management have increasingly become the subject of research as they offer a more accessible option for individuals seeking self-help or adjunctive therapy (Baumel, Edan & Kane, 2019; Kazdin, 2017). The study does not only verify the efficiency of NUMO app but, by examining both high-intensity and low-intensity users, provides empirical data on how the app's usage correlates with improvements in ADHD-related outcomes. It was decided to run a quasi-experiment as it studies the real behavioural patterns of NUMO's users.

METHODS

The study was carried out on adults (25-45 years old), who had been diagnosed with ADHD. Only new NUMO users were recruited for the study. The exclusion criteria were alcohol or drug addiction, psychosis, bipolar disorder, schizophrenia; the early beginning of pharmacological or psychotherapeutic treatment of ADHD. We analysed 87 cases, 53 of them fell to high-intensity group and 10 to the low-intensity group. Other participants did not fit any pattern or dropped-out.

The aim of this study was to check the effectiveness of NUMO app in the development of organizational skills and in lowering ADHD symptoms in people with ADHD. The experimental hypothesis was that using NUMO frequently and intensively (at least completing 3 tasks at a time and skipping less than 10 days out of 90) would significantly improve the quality of life and lower ADHD symptoms. The experiment lasted three months.

The participants were measured with *Conners Adult ADHD Rating Scales* (*CAARS*) screening form in the beginning and in the end of the study. Also, their level of adaptation and the impact of ADHD on their life was measured by the following questions: "Generally, I feel productive in my daily life", "I struggle with my ADHD symptoms".

The study represents a quasi-experiment. Two groups of

participants were selected for further analysis. The first group (high-intensity) used NUMO app almost every day (skipped less than 10 days out of 90), performing at least 3 tasks a time on average. So-called low-intensity group skipped more than 30 days, performing less than one task on average, but still did use the app during the 90 days and had a constant pattern of low-intensity users.

NUMO is an app that combines psychoeducation, science-based exercises, and a supportive community made of people with ADHD. This study was focused on performing tasks. The tasks put together the best CBT practice. Specifically, the participants of the experimental group constantly used a daily planner that gave them a possibility to transfer tasks to the calendar. The other frequently used task was a task division into small parts which helped to win out the procrastination. Many participants used thoughts testing technique, that helped them lower anxiety or sadness along with the diminishment of procrastination or harmonizing social interaction. Participants also used additional tools, like white noise, for example. Users got involved in group activities where they could share their goals and track their accomplishments with other participants. It gives users additional motivation, structure, and emotional support.

RESULTS

After three months, the results of the two groups before and after were compared.

The differences in pre- and post-experimental results were compared using paired samples *t*-test (see Table 1).

Significant differences between scores on CAARS screening form results were demonstrated in the pre- and post-experimental results of the high-intensity group (see Figure 1). There are significant differences (<.001) in every one of the four scales. Moreover, there are significant differences in answers to questions on quality of life. There is <.001 significance level difference between pre- and post-experimental answers to the question "Generally I feel productive in my daily life" and a .041 significance level difference between answers to the question "I struggle with my ADHD symptoms". A less significant difference in the second question is expected because the participants did not get rid of ADHD and did not stop suffering from its outcomes. However, they showed a lower level of discomfort.

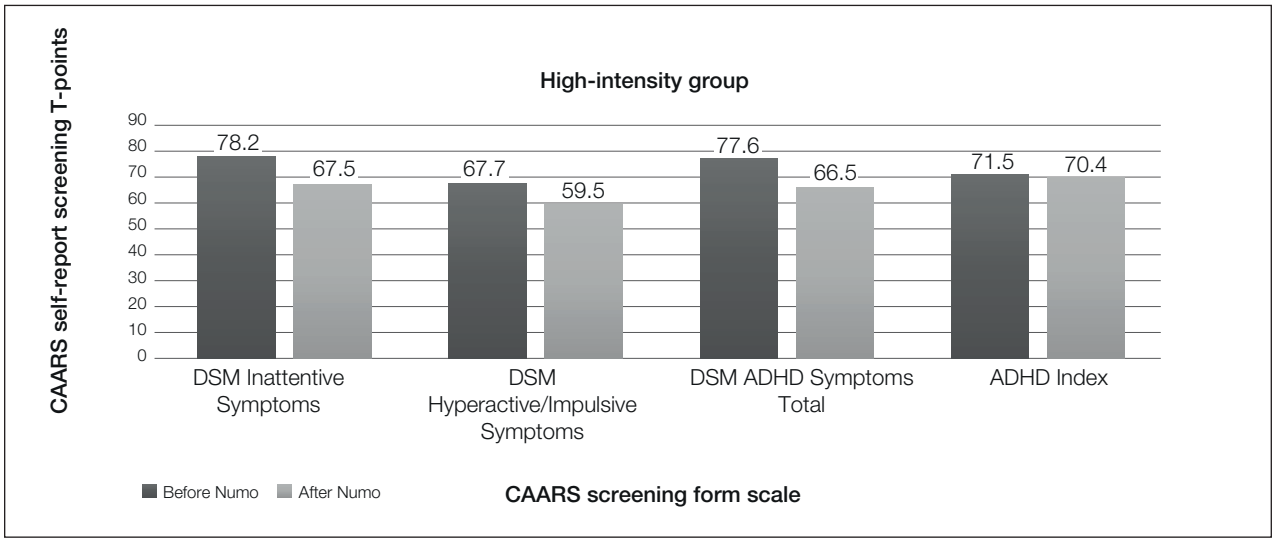
Before using the application, 5% of experimental group participants reported not being productive at all, 69% being

Table 1 – The differences in high-intensity group pre- and post-experimental results

Source	*t*	*df*	*p*	*Cohen's D*
Inattentive symptoms	8.52	52	<.001	.91
Hyperactive/impulsive symptoms	6.39	52	<.001	.85
ADHD symptoms total	8.47	52	<.001	1
ADHD index	10.76	52	<.001	1.4
Generally, I feel productive in my daily life	–4.67	52	<.001	–.65
I struggle with my ADHD symptoms	3.15	52	.003	.45

Legenda. df = degree of freedom.

Figure 1 – The difference between CAARS screening form results for high-intensity group before and after the experiment



just a little productive and 26% claimed being pretty much productive. While 2.6% reported not being struggling at all with their ADHD symptoms, 64.1% struggling pretty much and 33.3% were struggling very much (see Figure 2).

After 3 months of constant usage, 2.6% claimed being not at all productive, 38.5 being just a little productive, 51.3% being pretty much productive and 7.7% being very much productive. While 25.6% reported struggling very much with ADHD symptoms 43.6% of pretty much struggling and 30.8% struggling just a little (see Figure 3).

The paired samples *t*-test showed low difference in before and after experiment in CAARS screening form results and answers to two questions on quality of life (see Table 2). However, this group might have had some benefits from its occasional usage of Numo, as their results of CAARS (but not additional questions) got a little better (see Figure 4).

The answers distribution on productivity remained the same. It is plausible as participants built no new skills. Exactly the same numbers could be explained by a small number of this sample. The level of struggling with the ADHD symptoms went even worse than before. Maybe, it could be explained by frustration by inability to follow the program (or other life circumstances) (see Figure 5 and Figure 6).

We need to mention, that there was no significant difference between pre-experimental CAARS screening form results of high- and low-intensity group (see Table 3).

DISCUSSION AND CONCLUSION

From the experimental data, it can be concluded that NUMO application is effective in symptom reduction and improvement of quality of life. However, intense, and frequent usage is required. It is known, that only massive stimulation can lead to LTP and therefore, to neuroplastic changes and the installation of new skills.

The results were predictable, as NUMO is based on cognitive behavioural therapy exercises like task division, planning, group-based motivation that are evidence-based itself challenges (Baumel, Muench & Kane, 2019). It is consistent with previous researches showing the effectiveness of CBT in improving executive functioning in individuals with ADHD (Safren, Sprich, Chulvick & Otto, 2005). However, one tool that puts together the basic ADHD protocol can lower the requirements for self-organization and self-monitoring. As the population affected by ADHD has lower executive functioning, it is indispensable to have all the tools in one place. We should also mention the importance of commitment inside of the group of other users, group support, and the possibility of sharing the goals and the achievements and the constant memos that the program sent. The study supports the findings of Torous and colleagues (2018). On how mobile apps can be used on support or sometimes replace therapy.

Figure 2 – The high-intensity group answers on two questions regarding the quality of life before the experiment

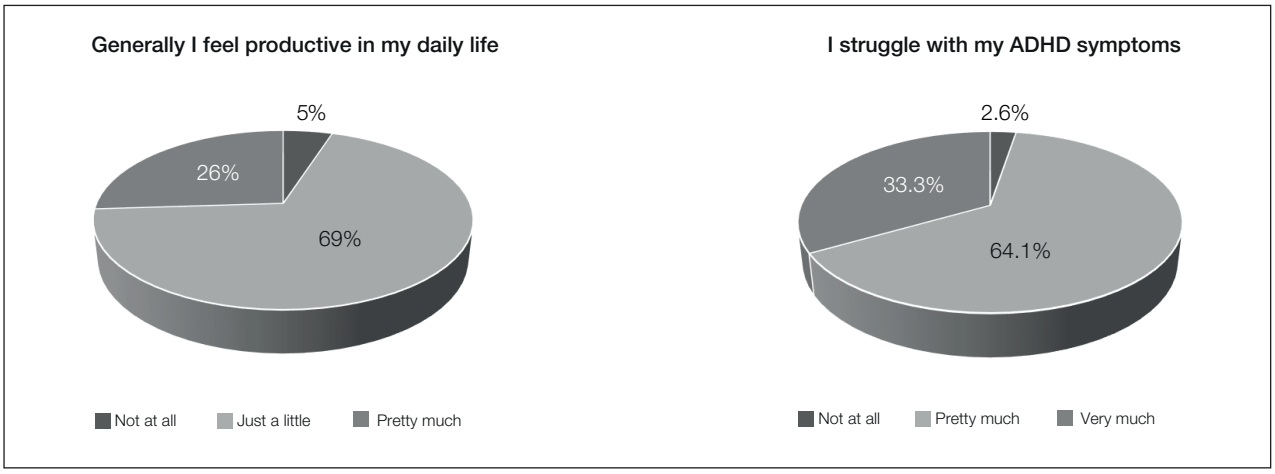


Figure 3 – The high-intensity group answers on two questions regarding the quality of life after the experiment

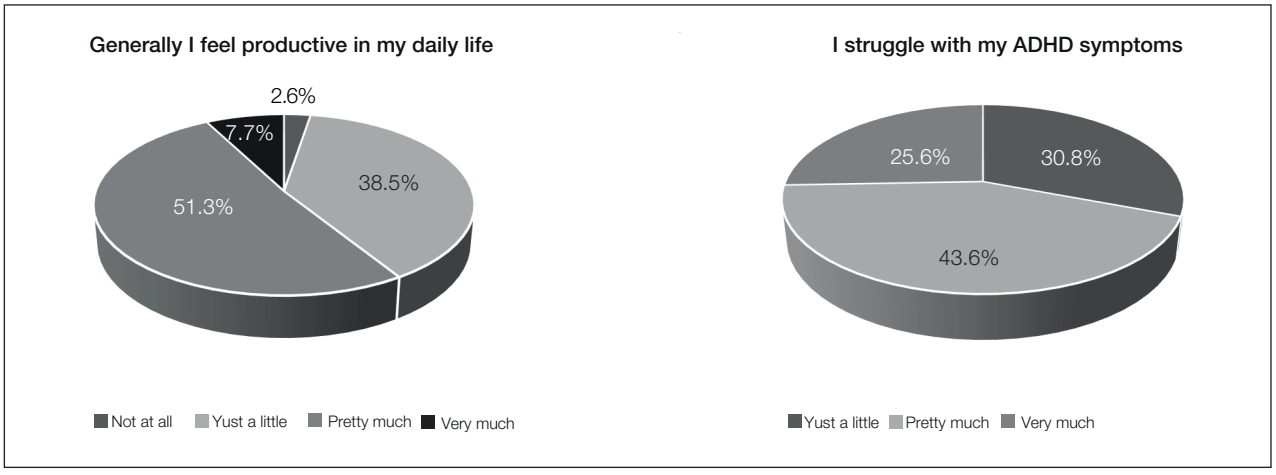


Table 2 – The differences in low-intensity group pre- and post-experimental results

Source	*t*	*df*	*p*	*Cohen's D*
Inattentive symptoms	2.18	9	.028	
Hyperactive/impulsive symptoms	3.0	9	.007	.97
ADHD symptoms total	2.69	9	.012	.85
ADHD index	2.76	9	.035	.67
Generally, I feel productive in my daily life	–.55	9	.296	.17
I struggle with my ADHD symptoms	.8	9	.222	.16

Legenda. df = degree of freedom.

Figure 4 – The difference between CAARS screening form results for the low-intensity group before and after the experiment

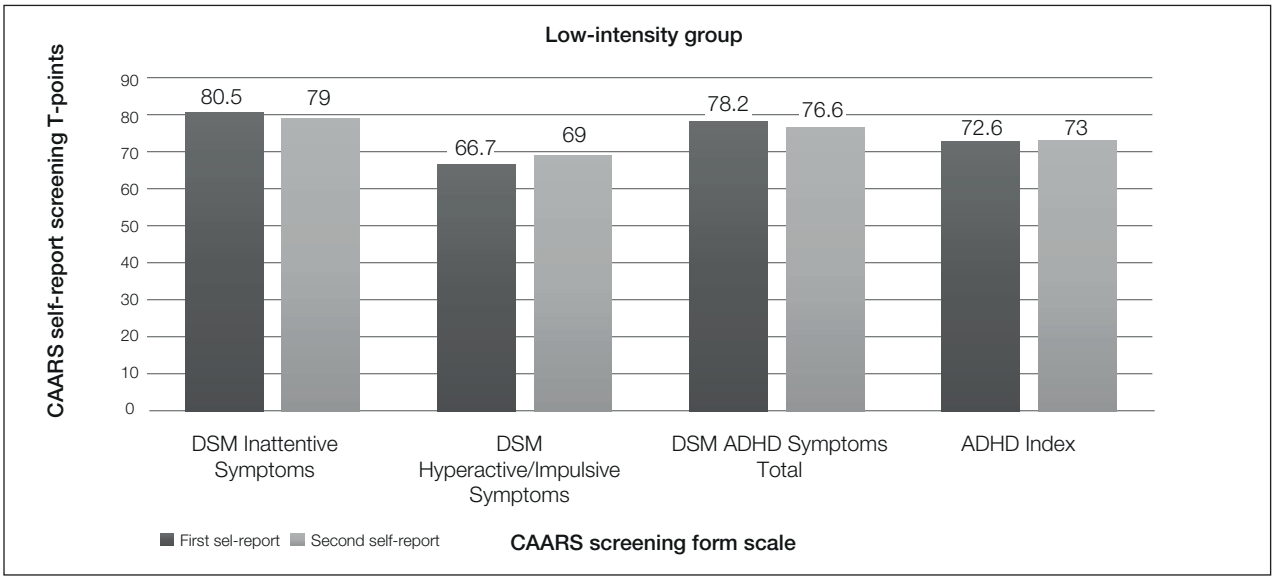


Figure 5 – The low-intensity group responses on two questions regarding the quality of life before the control the experiment

Figure 6 – The low-intensity group responses on two questions regarding the quality of life after using NUMO for 3 months

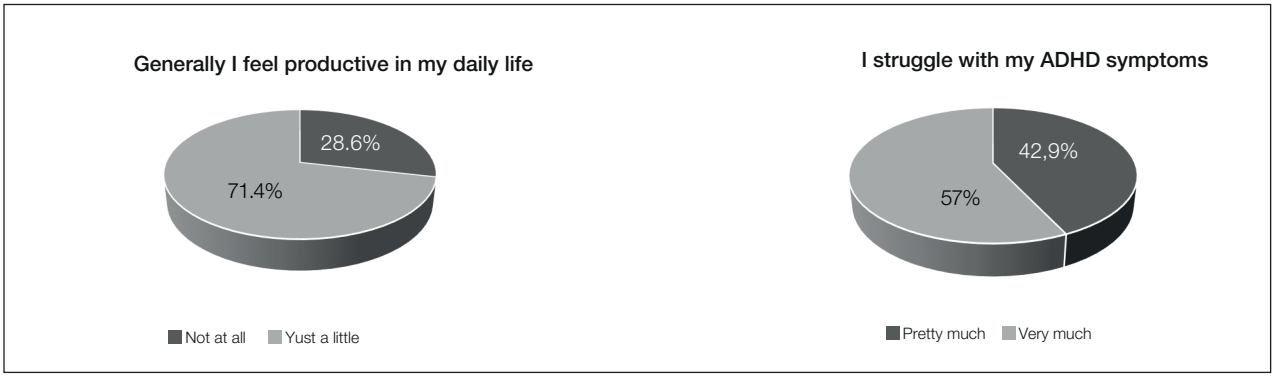


Table 3 – Comparison of pre-experimental results of two groups

CAARS subscales	*F*	*p (F)*	*t*	*df*	*p (t)*	*Cohen's D*
Inattention	.75	.388	–.967	78	.168	.33
Hyperactivity/impulsivity	.01	.917	–.158	78	.437	.05
ADHD symptoms	.75	.387	–.646	78	.260	.21
ADHD index	.04	.837	–.404	78	.343	.13

Legenda. df = degree of freedom.

The study shows the effectiveness of programs aimed at developing new behavioural and cognitive skills in population affected by ADHD. Future development of similar tools can be beneficial for people with ADHD. Further research on people without ADHD who might want support in executive functions might amplify the possible application of this tool.

Limitations of the study

One of them is the small number of participants in the low-intensity group. A randomized study with equal numbers of participants (higher than 50) could be performed in the future to improve the generalizability of the findings. It was chosen to run a quasi-experiment that performed to observe natural behavioural patterns. However, due to the low number of participants in the low-intensity group, we were forced to use three separate analyses, including two sets of Student's *t*-tests for dependent samples and one set of Student's *t*-tests for independent samples.

Other future studies might focus on comparison of different mobile application. Such a study would help determine the most effective tools and give more information for its further development. Other parameters of effectiveness measurement, such as broader criteria of live quality and observer reports might be added it further research.

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