Internet use and well-being during the COVID-19 outbreak: Examining the role of gender, age, motives for using the internet and relational resources in an Italian adult sample.

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Abstract

The COVID-19 outbreak introduced self-isolation and social distancing as measures to reduce the spreading of the pandemic. As a consequence, internet usage has increased globally. The current study aims to show whether internet worked as a resource for well-being or as an amplifier of psychological distress and problematic internet use (PIU), considering the role of gender, age, motives for using the internet and online/offline relational resources.

Five hundred and seventy-three adult participants (M: 40.28; SD: 16.43; 64% women) completed a form on sociodemographic characteristics and Internet use, and completed standardized measures on loneliness, online social support, well-being and PIU. A principal component analysis was computed to identify the main motives Internet use; ANOVA and Pearson's r correlations were computed to examine (dis)similarities in motivational components with respect to gender, age-group and psychosocial measures. A multivariate multiple regression analysis was performed to assess the contribution of the hypothesized predictors on overall well-being and PIU.

Three principal motives for Internet use were detected: leisure and social interaction, knowledge, learning/working. Significant differences were found among them with respect to gender and age group and online/offline relational resources. Differences were found in the likelihood of PIU and well-being related to all the variables considered, with the exception of online social support for PIU and gender and age for well-being.

These findings call for further research aimed to disentangle the correlates of PIU in a time of physical distancing, as well as for innovative efforts tailored to blunt the impacts of social isolation and bolster social connectivity.

Keywords: COVID-19, social distancing, loneliness, social support, problematic internet use, well-being

1 Introduction

The COVID-19 outbreak introduced self-isolation and social distancing globally, with the consequence of an increased internet usage (Wiederhold, 2020). Several scholars have emphasized the potential impact of COVID-19-related changes (such as disruption of face-to-face human connection, breakdown of habits, uncertainty about the future, financial insecurity, and loneliness) on people's psychological well-being (Liu et al. 2020; Sood 2020; Vijayaraghavan & Singhal 2020). In this context, the massive use of the Internet can be a double-edged sword: on the one hand, access to technology has fostered people's well-being (e.g., through social media and working from home) and has facilitated the access to social support; on the other hand, it may have turned into problematic use, especially with regard to compulsive use and cognitive preoccupation.

The aim of the current study is to show whether internet worked as a resource for well-being or as an amplifier of psychological distress and problematic internet use (PIU). This question requires something more complex than a yes or a no answer; thus, what follows is a brief review of the literature about the different factors involved in fostering or obstructing people's well-being in the time of COVID-19.

1.1 The multiple functions of Internet use during the COVID-19 pandemic

Internet use may have represented for many people a significant resource to counteract physical distancing and isolation during quarantine measures, offering a means to communicate with others, maintaining networks of real friendship and facilitating support and interaction, providing entertainment and also health information (Nabi, Prestin, & So 2013).

On the other hand, the large-scale entry of technology into our lives during lockdown measures and the psychological distress related to such measures are thought to have caused an increase in PIU. Previous studies had widely supported the positive relationship between psychosocial problems, such as low social support and loneliness, and greater problematic use of social media (Elhai, Levine, & Hall 2020; Marino, Gini, Vieno, & Spada 2018a, 2018b; Musetti, Corsano, Boursier, & Schimmenti 2020; Ruggieri, Santoro, Pace, Passanisi, & Schimmenti 2020; Schimmenti & Caretti 2017; Venuleo, Ferrante, & Rollo 2020). This relationship is often explained through compensatory models, arguing that people can seek emotional relief through easily accessible means like internet devices, and over-reliance on such coping can lead to adverse consequences (Brand et al. 2019; Kardefelt-Winther 2014). It is likely that the COVID-19 pandemic and related measures of self-isolation and lockdown increased the tendency to engage in such behaviors in an excessive manner as putative coping strategies against anxiety, depression and loneliness (Király et al. 2020). However, the adaptive or maladaptive value of this coping mechanism on people's well-being during a pandemic needs to be explored in depth (Saltzman, Hansel, & Bordnick 2020).

In recent days electronic and printed media have reported an increase in internet use over the past few months, globally, but we know very little about people's motives for using the internet during lockdown, nor if significant differences exist in the features of internet use related to socio-demographic characteristics during a pandemic, which previous studies (conducted before health emergency) have described (Andrisano-Ruggieri et al., 2016; Ang 2017; Baloglu, Şahin & Arpaci 2020; Chen et al. 2017; Dufour et al. 2016; Fumero et al. 2018; Hunsaker & Hargittai 2018; Weiser 2000). Several scholars had suggested that motives for internet use distinguish between unhealthy internet users or those who have problematic internet use behaviours, from healthy internet use (Marino et al. 2017; 2018). For instance, previous studies have found that the levels of problematic internet use of people who use the internet to entertain themselves and to establish social interaction are higher than that of those who use the internet primarily to obtain information (Caplan 2002; Ceyhan 2011). It is likely that also during the COVID-19 lockdown measures differences in the functions ascribed to information and communications technology (ICT) may have played a role in determining the negative or positive impact on well-being and PIU. To our knowledge, no studies have thoroughly explored the characteristics of internet use during the COVID-19 pandemic related to gender; with respect to age, contrasting remarks have been made. Few scholars have argued that older adults often opt to not use new technologies – only 49% of people aged 50 years and older use the internet according to a representative survey across 16 European countries (Köning & Seifert 2018) – and this could lead to a double feeling of social exclusion in time of physical distancing (Armitage & Nellums 2020; Seifert, 2020). Other scholars noted that greater internet use among the young also exposes them to misinformation about the disease, which can fuel fear and constitutes a risk for health (Bledsoe, Papa, & Zimmermann 2020; Cuan-Baltazar et al. 2020; Schimmenti, Billieux, & Starcevic 2020).

1.2. Loneliness and social support during the COVID-19 pandemic

Higher levels of psychological distress associated with the pandemic have been reported among the general population by recent studies (Huang & Zhao 2020; Liu et al. 2020; Montemurro 2020). However, people's vulnerability to disruptive events is also shaped by the social and cultural resources readily available to people (Cannon & Müller-Mahn 2010; Saltzman et al. 2020; Venuleo, Gelo, & Salvatore 2020; Venuleo, Marinaci, Gennaro, & Palmieri 2020). For instance, previous studies have shown that symptoms of depression and other serious mental illnesses following other

pandemics (Lau et al. 2005; Mak et al. 2009) are exacerbated by loneliness and lack of social support (Wang et al. 2018).

Therefore, a further aspect that researchers would like to examine when investigating the relationship between internet use and well-being during the lockdown measures is related to people's relational context, which might represent a source of psychological distress or on the contrary a material and symbolic resource to cope with life's circumstances, supporting well-being and reducing the possibility of developing PIU. Recent studies have suggested a relationship between social isolation and psychological distress during a pandemic (for a review, see: Loades et al. 2020) and prior research has indicated that higher loneliness (defined as a disagreeable or unacceptable lack of desired meaningful social relationships, Zammurer, 2008) and higher informal support and advice on the internet motivates people to use social media, also for excessive amounts of time (e.g. Kamin et al. 2019; Tang, Chen, Yang, Chung, & Lee 2016). The health emergency may have exacerbated loneliness and the use of the internet as a way to compensate for this painful condition. If internet use reduced the feeling of loneliness and supported well-being by offering online social support, or on the other hand exacerbated pain and an unhealthy commitment on the internet is a question left unexplored. Previous studies suggested that online and offline social resources relate to higher well-being (Chu, Saucier, & Hafner 2010; Goswamiet al. 2020) but have a different impact on PIU. For example, Wang and Wang (2013) found that online support is positively associated with PIU, whereas offline social support has a negative relationship. A more complex relationship is suggested by the "social compensation vs enhancement hypothesis" (Zywica& Danowski 2008): accordingly, the outcomes of online social support on the users are either positive or negative depending on the strength of the user's perception of support in offline life. That is, if seeking online social support is meant to compensate for weak offline social networks, the user will tend to develop a problematic use of the internet. Grieve and colleagues'(2013) findings support this perspective: in their study on a large sample of Australian adults, in whom the effect of online social support in determining PIU and well-being was moderated by their offline social support. These studies suggest that offline and online social resources must be simultaneously taken into account in investigating their effects on PIU and well-being.

1.3. Aims

Considering these considerations, the study pursues two main goals:

- (a) First, to explore the relationships between socio-demographic characteristics (age and gender) and people's motives for using the internet during the COVID-19 pandemic. Consistently with previous literature, and due the different challenges faced during the pandemic related to age and gender, we expect to find significant differences in Internet motives related to socio-demographic characteristics;
- (b) Second, to examine the relative contribution of a) gender and age; b) internet use motives and c) online and offline relational resources (online social support and loneliness) on overall well-being and PIU, taking into account the association between these outcome variables. We expect that these potential predictors have an impact on health outcomes. Especially, it is likely that the greater the loneliness (thus the lower the offline relational resources), the lower the well-being and the higher the likelihood of PIU. With respect to online social support, we expect that it may increase well-being, acting as a resource to respond to the relational needs in the time of lockdown measures. A complex relationship is supposed to exist between online support and PIU: high support may increase the chance of a problematic internet use in the context of a high loneliness level; the opposite if the feeling is that of not being lonely. Finally, a significant negative relationship was expected between PIU and well-being.

2. Method

2.1 Participants and Procedures

An anonymous online survey was available online from 4th to the 24th May 2020, the period when the Italian government imposed self-isolation with the “Chiudi Italia” decree. The protocol was disseminated through social networks.

A total of 600 questionnaires were collected; 573 were completed and were used for the study (M: 40.28; SD: 16.43; women: 64%; aged 18-25: 30.2%; aged 26-35: 18.8%; aged 36-45: 9.8%; over 45: 41.2%). With regard to Internet use, 72.7% the participants report having used social networking sites “quite a lot” or “a lot” (in a four point Likert scale from not at all to a lot), 78% videocall platforms (e.g. WhatsApp, Skype and other platforms), and 67.6% streaming services.

All procedures performed in the study were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. According to the ethical code of the Italian Psychology Association (AIP) (<http://www.aipass.org/node/26>) and the Italian Code concerning the protection of personal data (Legislative decree No 101/2018), participants were informed about the general aim of the research, the anonymity of responses and the voluntary nature of participation and signed an informed consent form. No incentive was given. The project was approved by the Ethics Commission for Research in Psychology of the [blinded for review] (protocol n. [blinded for review]).

2.2 Measures

Application and devices for Internet use. Internet activities were assessed using a 4-point Likert scale from “1=Not at all” to “4=A lot”. The items consisted of 3 statements referring to the following use of Internet: social networking sites; streaming services; videochat/videocall. An example item is: “In the last two weeks, how much have you used Social Network sites (Facebook, Instagram, SnapChat, etc.)?”.

Internet use motives. Seven *ad hoc* items were used to detect the functions of Internet use in the past two weeks. The items were derived from extant research on uses and motivations for internet use which have widely recognised such core motivations as getting information, being entertained/leisure, interacting with others socially (establishing and maintaining contact with others), learning and self-reactive outcomes (such as relieving boredom) (Bozoglan et al. 2014; Flanagan & Metzger 2001; LaRose & Eastin 2004; Papacharissi & Mendelson 2010). The items consist of 7 statements referring to the following reasons for Internet use: work/study; keeping in touch with loved ones (family, friends); acquiring information about the covid-19 emergency; cultural entertainment; escaping from reality; satisfying interpersonal and social needs; having fun/spending time. An example item is: “In the last two weeks, how much have you used the Internet for work/study?”. Respondents were asked to use a 4-point Likert scale to evaluate the use of the Internet for each function. from “1=Not at all” to “4=A lot”.

Perceived loneliness. Subjective loneliness was measured using the General Loneliness Sub-scale from the Italian Loneliness Sub-scale (ILS; Zammuner 2008). ILS General Loneliness comprises 7 items measuring subjective perceptions of both social and emotional loneliness. Participants were asked to rate the degree to which they feel every statement in “the past two weeks” on a four-point Likert scale (from “I often feel this way” to “I never feel this way”). An example item is: “I lack

companionship". A high score indicates a high level of subjective loneliness. A good internal consistency was found in the current study (Cronbach's $\alpha = .80$).

Online support. The questionnaire for the Evaluation of Social Support (SS) (Poortinga 2006) was adapted to measure the perception of social support received online. The instrument consists of 7 statements related to online relationships and their capacity to make feel you good and to give encouragement. Each item is rated on a 3-point scale: 1="not true", 2="partly true", and 3="certainly true". An example item is: "Online there are people I know who can be relied on no matter what happens". A good internal consistency was found in the current study (Cronbach's $\alpha = .90$).

Overall well-being. The Italian version (Di Fabio 2016) of the Flourishing Scale (FS; Diener, *et al.*, 2010) by was used to evaluate general wellbeing. The FS encompasses items regarding human flourishing in relevant areas such as: purpose in life; relationships; self-esteem; feelings of competence, and optimism and consists of eight items with response options rated on a 6-point Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree). An example item is: "my social relationships are supportive and rewarding". Participants were asked to think to the past two weeks while answering. The FS showed a good reliability in the present study (Cronbach's $\alpha = .88$).

Problematic internet use. The 5-item version of the recently developed and cross-nationally validated Compulsive Internet Use Scale (CIUS; Lopez-Fernandez et al. 2019) was used for the measure of PIU. All items are scored on a 5-point Likert scale from 0 (never) to 4 (very often). Items capture the main aspects of online problematic behaviours, namely loss of control, preoccupation regarding Internet use, withdrawal symptoms, coping/mood modification, and conflict. Validated in eight languages, included Italian, the 5-item CIU is recognized as one of the best psychometric instruments assessing PIU in terms of its psychometric properties and consistency of findings across different sample (Lopez-Fernandez et al. 2019). An example item is: "Do you find it difficult to stop using the Internet when you are online?". A good internal consistency was found in the current study (Cronbach's $\alpha = .76$).

2.3 Data Analyses

The statistical analyses were performed in three steps.

First, as a preliminary step, a principal component analysis (PCA) was applied to the ratings of the Internet use motives to identify a few variables (formative factors) that can summarise the co-variance among the indicators (Coltman et al. 2008). The solution of PCA was rotated using Varimax rotation. The participants' factorial scores on the components extracted by PCA were used as a measurement of their Internet pattern of use.

Second, ANOVA and Pearson's r correlations were computed to test similarities and dissimilarities in the Internet motivational components with respect to gender and ageclass, as well as to the psychosocial measures of loneliness and online support.

Third, a multivariate multiple regression model was performed to assess the contribution of the hypothesized predictors (i.e. demographic characteristics, internet use motives, perceived online social support and loneliness) on the two dependent variables (i.e. overall well-being and PIU). The Lavaan package (Rosseel 2012) of the software R (R Development Core Team 2012) and the Maximum Likelihood estimator were used. To evaluate the goodness of fit of the model we considered the R^2 of each dependent variable and the total coefficient of determination (TCD; Bollen 1989; Jöreskog & Sörbom 1996).

3 Results

3.1 Internet use motives

The scree plot of PCA applied to the internet motives indicated a three-component solution (Table 1) as a good choice (variance explained = 64%). Variables loading heavily on the first component (34.2% of the variance) were to have fun/to spend time, to escape from reality, to satisfy interpersonal and social needs, and to maintain connections with the loved ones; this component was labelled "*Leisure and social interaction purposes*". Variables loading heavily on the second component (16.37% of the variance) were to acquire information on the COVID-19 health emergency and to have cultural entertainment; this component was labelled "*Knowledge purposes*". Finally, only one item load significantly on the third component (13.34% of the variance) which was labelled "*Learning/working purposes*". The three factors seem to be consistent with the core motivations found by previous studies on uses and gratifications of media (Flanagin, & Metzger 2001; LaRose & Eastin 2004). For instance, Flanagin and Metzger (2001) identified leisure and relationship purpose, informational purpose and learning. The standardized scores of the subjects on the three components were used for the subsequent analysis.

[TABLE 1 insert here]

3.2 (Dis)similarities of Internet use motives for gender and age

Significant differences were found with respect to gender and age-class on the mean scores of the three motives (i.e. leisure and social interaction, knowledge purposes, learning/working purposes), with women scoring higher than men; the classes 18-25 and 26-35 years scoring higher on "leisure and social interaction purposes" than the older, the classes 36-45 scoring higher on "knowledge purposes" and "learning/working" purposes than the other group (Table 2).

[TABLE 2 insert here]

3.3 Relation between internet motivational components and relational resources

Results from Pearson's r correlations between relational resources measures and internet use motives (table 3) show that the higher the loneliness level, the greater the use of internet for leisure and interactional purposes, and the higher the online social support, the greater the use of internet for all the three motivational components identified.

[TABLE 3 insert here]

3.4 The impact of demographic characteristics, loneliness and online social support on measures of well-being and problematic internet use

Results of the multivariate multiple regression (figure 1) show that gender and age do not have an impact on well-being, but they affect PIU; particularly women, compared to men, and the young, compared to the elderly, are more likely to report higher levels of PIU. Internet function components affect the outcome measures differently: the use of the internet for "knowledge" and "learning/working" purposes positively predicts well-being but not PIU; the use of internet for "leisure and social interaction" purposes predicts PIU but not well-being. Loneliness is shown to

affect both well-being and PIU: the higher the loneliness level, the lower the well-being and the higher the levels of PIU. Online social support affects well-being (the higher the online support, the greater the well-being) but not PIU. A significant negative relationship was also found between well-being and PIU (-0.15 ; $p < .001$). The model accounts for 27.8% of the variance of well-being, and for the 28.6% of variance of PIU. Finally, the total amount variance explained by the model and indicated by the Total Coefficient of Determination (TCD= 0.46) shows a good fit to the observed data.

[FIGURE 1 insert here]

4 Discussion

The study has deepened our knowledge of people's motivations for using the internet during the COVID-19 pandemic, their relationships with the online and offline relational resources and the impact of these on overall well-being and PIU.

Findings are consistent with previous studies, which have shown a negative effect of increased age on Internet use, in terms of time spent online, frequency, or variety of usage (Blank & Groselj 2014; Pearce & Rice 2013; Van Deursen & Van Dijk 2014). The findings also show that younger people more frequently engage with all usage types. The study of Büchi and colleagues (2016), based on cross-country comparisons, offered support to our findings and showed that social interaction and entertainment are particularly dependent on age. Gruber and colleagues (2020) noted that emerging adulthood may represent a developmental stage with unique challenges imposed by COVID-19, such as disrupted social roles as a result of missing important experiences and returning to living with parents. So, it is understandable that the urge to use the internet to maintain social interaction was higher for the younger age-group than for the older groups. Different factors may explain the increased use of internet for knowledge purposes among people aged 36-45, included closer proximity to their loved ones, which may have made the need to use the internet for leisure and social interaction purposes less intense, and the higher awareness of the severity of the health emergency. In the context of previous pandemics, the perceived severity of the situation has been shown to increase information sharing (Huang et al. 2015).

With respect to gender, previous reviews on technology use found significant differences in the patterns of ICT use among men and women (e.g., Ang, 2017; Goswami & Dutta, 2015; Krasnova et al., 2017; Venkatesh, Thong, & Xu, 2012). For example, some studies have suggested that women are mainly driven by relational uses, such as maintaining close ties and getting access to social information on close and distant networks and to health-related information, whereas men base their continuance intentions on their ability to gain information of a general nature (Bidmon & Terlutter, 2015; Krasnova et al., 2017; Lim & Kumar, 2019; Lupton & Maslen, 2019). Our findings suggest a more differentiated use of internet among women during lockdown measures: they were found to have used internet more than men for all three function components, expressing not only relational purposes but also the goals of knowledge (not limited to the health emergency but extended to cultural resources available in the internet) and learning/working purposes. Multiple factors may explain this extensive use of internet among women. Some scholars have indeed suggested that inequality in the employment situation and in the distribution of activities related to family management and children's care could have amplified women's multitasking agenda (Hutt, 2020; Rinaldi, 2020) and thus the importance of being able to do any activity at any time, such as finding information and engaging in entertainment activities directly at home (Bidmon & Terlutter, 2015).

Do different patterns of usage relate to people's relational resources? Our findings show that people using internet for leisure and interactional motives are characterized by higher levels of loneliness and higher online social support. In this respect, it seems that internet has provided these individuals with a potential answer to their relational needs which remained unsatisfied in their offline context. The findings are consistent with the compensatory model of PIU, which suggests

that people who feel “left out” may go online in order to compensate for their lack of offline social relationships (Kardefelt-Winther 2014; Király et al. 2020). People using internet for “knowledge purposes” and for “learning/working purposes” do not describe themselves as having high or low levels of loneliness but tend to express higher levels of online social support. Thus, online social support seems to be associated to internet use whatever the motive for surfing the net. The findings are consistent with the proposal to differentiate the role of the offline and online relational resources in examining people’s involvement with the internet (Grieve et al. 2013; Wang & Wang 2013). Considering the specific circumstances, that is, the COVID-19 lockdown measures, the findings suggest that Internet was felt to be a crucial kind of support, regardless of the motives for using it. Given the sudden breakdown of daily routine and habits imposed by the health emergency throughout various domains of life, it is understandable that the very possibility of maintaining online social contact, leisure, cultural entertainment, working and studying took on the sense of offering a supportive resource.

What is the effect on overall well-being and PIU of the selected potential predictors (i.e. gender, age, internet use motives, loneliness, online social support)? Multivariate multiple regression analysis showed differences in the likelihood of PIU in relation to all the variables considered, with the exception of online social support. Specifically, being a younger woman, using internet for “leisure and social interaction” purposes and suffering from loneliness were shown to be predictors for PIU.

The association between younger age and PIU is consistent with previous studies (Kuss & Lopez-Fernandez, 2016). The same consideration applies to the impact of leisure and social purposes on PIU (e.g. Kircaburun et al., 2018; Li & Chung, 2006). For example, Kircaburun and colleagues (2018) found that higher levels of internet use for social reasons (i.e. meeting new people and socializing) and entertainment were associated with problematic social media use among university students. The recent study of Gao and colleagues during the COVID-19 pandemic (2020) reported that leisure-time internet use, but not work-time internet use, was positively associated with PIU. Accordingly, the increased use of the Internet during the lockdown measures did not mean a higher risk of PIU but favored this risk when the Internet was the only way to achieve leisure and social purposes.

With regard to gender, previous reviews on technology use reported mixed results (for a review: Baloglu, Şahin & Arpacı 2020). Several studies reported gender differences, with a wealth of research reporting that men are more vulnerable to PIU and to severe symptoms of it compared to women (El Asam, Samara, & Terry 2019; Fumero et al. 2018; Kanan et al. 2019; Yu et al. 2018; Wartberg, Zieglmeier, & Kammerl 2020). However, another group study came to the opposite conclusion, finding higher PIU severity among women (Casaló & Escario 2019; Karaer & Akdemir 2019; Laconi et al. 2018), consistently with our findings. It is possible that these different findings are related to different study samples and different types of Internet use examined (e.g., games, social networks, e-commerce sites). However, it must be stressed that the importance of micro-politics, families, social and cultural capital in an individual’s internet acquisition and use should not be overlooked. As already suggested in the relevant literature (Anderson & Tracey 2001; Selwyn et al. 2005) – it is not being a woman per se which makes a problematic internet user or non-user, but the opportunities, needs, motivations, material circumstances and lived experiences of being a woman which all amount to such involvement.

Concerning the relationship between loneliness and PIU, previous studies have already recognised the positive association between them (Caplan 2006; Holt-Lunstad et al. 2015; Yao & Zhong 2014; Zhang et al. 2018), although competing hypotheses have been suggested: the displacement hypothesis proposes that heavy Internet use increases loneliness, isolating people from face-to-face interactions with others (Mohseni et al. 2008; Nie 2001); conversely, other scholars suggest that lonely people are more likely to be attracted to Internet use (Demir & Kutlu 2016; Song et al. 2014; Sharifpoor et al. 2017), consistently with clinical reports and several influential theoretical

models (e.g., self-medication model, see Schimmenti & Caretti, 2010, 2017; Schimmenti et al., 2012, for an application of the model on PIU) that underline the important role played by psychological and social malaise in promoting PIU (McPherson et al. 2013; Venuleo et al. 2016). Finally, a third view proposes that the association between loneliness and PIU has to be conceived as bidirectional (Tian et al. 2017; Zhang et al. 2018) and dynamic (Nowland, Necka, & Cacioppo 2018), depending on the reasons for internet use. Our findings show that only the component of “leisure and social interaction motives” is associated to greater loneliness and has a critical impact on PIU. The specific circumstances of the current study – the lockdown measures related to the COVID-19 health emergency – may have contributed to identify leisure and social purposes as a way to escape from reality: a reality felt by a large part of the population as a source of fear and distress (Schimmenti et al., 2020).

With respect to overall well-being, multivariate regression did not prove the impact of gender and age-related differences. However, a significant impact of the use of internet for “knowledge” and “learning/working” purposes, loneliness and online social support was found.

It is worth noting that loneliness can be recognized as a common risk factor for PIU and well-being, supporting the idea that relational resources played a crucial role during lockdown measures both in protecting people from psychological distress and in influencing the possibility that internet worked as a resource or amplifier of clinical symptoms.

Finally, the fact that well-being and PIU proved to be associated is consistent with the previous literature (Muusses et al. 2014; Schimmenti et al. 2012), which has widely recognized the relationship between PIU and well-being. Although the debate regarding the directionality of this association remains open, a few longitudinal studies suggested that PIU and well-being mutually reinforce each other, in that lower wellbeing influences internet escapism, which increases the likelihood of PIU, which in turn may decrease wellbeing even further, leading to harmful consequences (Ohno 2016; Van den Eijnden et al. 2008; Vidal et al. 2020). Consistently with the view of a circular linkage, we tend to hypothesize that in the context of lockdown measures related to the COVID-19 health emergency, which reduced offline social contacts and had a recognized negative impact on psychological well-being, poor well-being increased the likelihood of PIU which, in turn, worsened the wellbeing.

Limitations

The present results are preliminary, and some limitations needed be acknowledged. First, the non-randomly selected sample and the use of self-reported data may be influenced by recall bias and answer accuracy. Second, the cross-sectional design of the study does not allow definitive statements about causality. Third, further studies are needed to investigate the role of other important factors in mediating the effect of the target variables on people’s well-being and PIU: individual risk factors, such as anxiety and depression as recognized correlates of lockdown measures, and subjective and contextual aspects, such as the meaning through which people have interpreted the health emergency, the different life situations and the related specific challenges imposed by the pandemic.

Conclusions

Our findings support the view that some of the pandemic-related circumstances, such as physical distancing and increased internet usage, have an impact on people’s well-being depending on the relational resources available to them to cope with the situation. It is not new, but a sign that the psychological features of health emergency need to be considered deeply. Social disconnectedness, perceived isolation and lack of social support have constantly been found to present distinct associations with mental health (de Jong Gierveld, van Tilburg, & Dykstra 2018). However, these

kinds of considerations have found little space in the debate on the impact of the pandemic. On the one hand, the institutional responses put in place to protect citizens have mostly interpreted health in biological terms, marginalising the psychological aspect of well-being; on the other hand the overriding focus of the scholars in the field of human and social sciences on the negative effects of the health emergency overshadowed the many variations in the experience of quarantine due to contextual aspects related to the micro-sphere (such as with whom one lives and the quality of the relationship), as well as the macro social sphere (e.g. the institutional responses put into place to respond to the health emergency and to support citizens).

As clinical implications, our findings highlight the critical role of relational resources in reducing the risk of PIU and improving individual well-being. This suggests that preventing psychological disorders and PIU in a time of physical distancing requires an in-depth consideration of the networks where people live, which may provide the conditions and instruments to deal with problems in life and use the Internet in a healthy manner. Innovative and effective efforts to blunt the impacts of social isolation and bolster social connectivity are more critical than ever before. Pivotal initiatives to increase distal connectivity during the current pandemic are documented (Smith, Steinman, & Casey 2020). For example, many organizations are using telephone reassurance and efforts to encourage involvement, which include having community health workers, social workers, clinicians, and other personnel make telephone calls to vulnerable groups in order to check on their general well-being and identify needs, offer an opportunity for socializing, and link them to available services and resources. Capitalizing on existing research and practices in the field, clinicians and health/social services can contribute to the effort of mitigating the risk of social isolation when physical distancing is needed to ensure people's safety.

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Figure 1. Results of the multivariate multiple regression analysis

Notes: * $p < .05$; ** $p < .01$; *** $p < .001$.

Table

Table 1 – Components of internet use motives (PCA)

Items	Factor loadings			Components' label
<i>In the last two weeks, how much have you used the Internet ...</i>	1	2	3	
...to have fun/to spend time	.81		-.13	
...to escape from reality	.76			
...to satisfy interpersonal and social needs	.67	.27	.23	<i>Leisure and social interaction purposes</i>
...to maintain connections with the loved ones	.60	.40	.24	
...to acquire information on the COVID-19 health emergency		.78		
...to have cultural entertainment (to visit museum online, to read books online...)	.14	.71		<i>Knowledge purposes</i>
...to study/to work			.96	<i>Learning/working purposes</i>

Table 2 – Mean and Standard Deviation of Internet use motives for gender and age-group

Demographic variables		Leisure and social interaction purposes			Knowledge purposes			Learning/working purposes		
		Mean (SD)		F	Mean (SD)		F	Mean (SD)		F
Gender	Men	-0.15	(0.92)	6.63*	-0.11	(1.01)	3.99*	-0.16	(1.00)	9.11**
	Women	0.07	(1.03)		0.07	(0.99)		0.10	(0.98)	
	18-25	0.38	(0.98)	30.60***	-0.25	(1.08)	7.09***	0.08	(0.88)	5.82**
Age-group	26-35	0.35	(0.96)		0.03	(0.87)		0.09	(0.91)	
	36-45	-0.10	(1.00)		0.40	(0.84)		0.34	(0.87)	
	45+	-0.42	(0.86)		0.07	(0.99)		-0.19	(1.11)	

Notes: * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 3 – Internet use motives and relational resources - Pearson's correlations

Internet Use Motives	Leisure and social interaction	Knowledge	Learning/working
Gender	.11*	.08*	.13**
Age	-.37***	.10*	-.19***
Loneliness	.12**	-.08	-.07
Online Support	.30**	.17**	.14**
Problematic Internet Use	.45***	-.02	.06

Notes: * $p < .05$; ** $p < .01$; *** $p < .001$.

Availability of data and material: The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation

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Consent to participate: The participants provided their written informed consent to participate in this study.

Figures

Figure 1

Results of the multivariate multiple regression analysis. Notes: * $p < .05$; ** $p < .01$; *** $p < .001$.