

Psychological first aid models during the COVID-19 Outbreak

The role of InfoCommunication Technologies

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Abstract—In few months, COVID-19 outbreak, lockdown and social distancing have led an exponential increase in levels of psychological distress within the population. In the face of such conditions, the need to ensure continuity of mental health services emerged concurrently with the need of a substantial intervention reconfiguration. This paper is aimed at addressing the knowledge gained from telepsychological interventions during the COVID-19 outbreak peak to identify new research lines originating from the limits encountered during interventions. This has relevant implications even for the development of new IC technologies, and more generally for the scope and goals of CogInfoCom.

Keywords— COVID-19, telepsychology, communication, conversational agents, mental health

I. INTRODUCTION

The wide diffusion of the severe acute respiratory syndrome coronavirus 2 (SARSCoV-2) and the consequent quarantine have produced significant challenges for social fabric, welfare and health care systems [1]. Data reported by the European Centre for Disease Prevention and Control (ECDC) [2] indicate that, from 31 December 2019 until 30 June 2020, 10 273 001 cases were infected by the SARSCoV-2 worldwide, including 505 295 deaths. In Europe, 2 427 670 cases have been reported, including 191 411 deaths. Social isolation experienced as a preventive measure to block the spread of the SARSCoV-2 has been lived worldwide as a highly significant experience; indeed, the obligation to stay at

home, and, as a consequence, separation from the loved ones, loss of freedom, uncertainty about the course of the emergency, perceived job insecurity and boredom have had important psycho-social effects on the population [3]. Indeed, in absence of a shared vaccine protocols with proven efficacy, quarantine and social distancing have shown their benefits by allowing the contagion reduction, even though such measures undermined interpersonal relationships and precluded socialization contexts that usually people live to manage daily distress and find comfort (e.g., family reunion, friendship, community events, sports, religious celebrations). Technologies were found to have the potential to mitigate the negative effects that social distancing may have on wellbeing [3], due to a massive migration of leisure and job activities on online platforms. During the coronavirus disease 2019 (COVID-19) outbreak, InfoCommunications Technologies (ICT) were used even for medical and psychological interventions. For instance, telepsychology initiatives, defined as the provision of psychological services using telecommunication technologies [4], have been offered in several countries in order to help people to face with psychological challenges produced by quarantine and social distancing [5]. Video conferencing, online forums, smartphone apps, text messages and emails have proven to be promising methods for communication and provision of mental health services [6]. It has also been demonstrated that people in isolation have actively looked for online support to meet their psychological needs, showing both interest in the service offered and acceptance of such medium [6, 7]. Currently, although the outbreak is under containment in Europe, social distancing remains an elective prevention measure, thus creating interesting premises for the implementation of management models, where Artificial Intelligence could have a prominent role. Based on these premises, the current work was aimed to discuss information gained from telepsychological experiences during COVID-19 outbreak, in order to identify new research perspectives arising from the criticality emerged during interventions. In the following sections, we will present an overview on the impact that COVID-19 had on mental health. Then, we will report intervention models developed during the outbreak, particularly focusing on RAPID-PFA protocol. Finally, we will suggest advantages of applying Artificial Intelligence on health care system and the importance of using Conversational Agents specifically developed for telepsychological interventions

II. IMPACT OF COVID-19 ON MENTAL HEALTH

The COVID-19 outbreak, in particular through the containment measures necessary to avoid the spread of the virus, has produced significant negative effects on people mental health [8]. The presence of new physical symptoms in those without mental illness, the worsening condition of individuals affected by underlying mental illness and the distress of people with relatives affected by the virus can certainly highlight the huge negative psychological impact of this outbreak [9]. Regardless of exposure, people have developed fear and anxiety about getting infected or dying [10]. Previous studies have reported higher prevalence of psychological distress, emotional disturbance, irritability, low mood, insomnia, depression and anger [9, 10]. Population at risk of infection or with suspect symptomatology have

experienced high risk of developing severe psychopathological disorders, such as post-traumatic stress disorder, depression, panic attacks, psychosis and suicidality [3, 8]. Even after the outbreak resolution, feelings of shame, guilt and social stigma can persist [11]. The COVID-19 outbreak has increased the risk of mental illness for the global population, even more for people affected by pre-existing health issues (e.g. having chronic illness, old age, functional disability, mourning ecc.) [12]. As already happened for severe acute respiratory syndrome (SARS) in 2003, patients affected by COVID-19 could develop anxiety and sleep disturbances, mood disorders related to painful feelings of worry about their life and the safety of their loved ones, even helplessness due to uncertainty about treatment efficacy [3, 13]. The risk of psychiatric sequelae – stress-related, depressive, and anxiety disorders – after discharge is high [14] and this is the reason why particular attention should be paid in order to support a full recovery. Specific monitoring should be addressed to health care workers (HCWs) who may develop negative mental health outcomes (e.g., sleep problems, work-related stress, burden, etc.) even after the end of the emergency [15, 16, 17] Compared with non-HCWs, they are exposed to increasing burden due to and highly demanding role in the emergency management. [17]. Working with patients infected by SARSCoV-2 heightens the HCWs' anxiety of getting infected and transmit the infection to their loved ones. HCWs carry the further load of balancing the professional duty and altruism with personal fear that can often cause distressing conflict [18].

III. TELEPSYCHOLOGICAL INTERVENTION MODEL DURING EPIDEMICS

Given the evidence about the increased risk for mental health and psychosocial distress, it has been necessary to provide commensurate initiatives; in the last few months several Emergency Psychology intervention models related to the COVID-19 emerged from scientific literature, operationalizing psychological intervention – based on accredited protocols – according to the local peculiarities [19]. Among the mental health first aid field, the Johns Hopkins RAPID-Psychological First Aid (PFA) [20, 21] is one of the dominant protocols, designed to mitigate the effects of acute stress and trauma that can help people to cope effectively with adversity. However, such a method can effectively be applied as a public health tool to answer to mental health needs following critic events and to build up community resilience [22]. This protocol is based on some salient features: first, capacity surge is the ability to respond to an increasing peak of demand for mental health services. Indeed, from the analysis conducted by Fran Norris et al. [23] it emerged that, after a disaster, the demand for mental health services would increase from 15 to 25%. Last, the key objectives are the stabilization and mitigation of the acute distress.

TABLE I. RAPID PFA STEPS

R-Rapport: establishing a relationship through reflective listening to people's needs.
A-Assessment: distinguishing those who are in a state of serious distress from those who are not through the exploration of crucial dimension, such as the ability to understand instructions, express

emotions, interpersonal resources, etc.
P-Prioritization: this phase is comparable to medical triage and is aimed at assigning people to different levels of care.
I-Intervention: this step aims to mitigate distress through specific psychological strategies (e.g. progressive muscle relaxation, cognitive reframing, etc.).
D-Disposition: it consists in closing the intervention or transitioning to follow-up or other clinical supports.

Actually, scientific literature highlighted only three specific model of mental health first aid interventions – specifically addressed to the psychological impact of the COVID-19 outbreak – developed, respectively, in China [24, 25] and Italy [26].

The first model proposed during the outbreak was from the West China Hospital. Zhang et al. [24] proposed a dynamic model for psychological crisis intervention addressed to people with high levels of distress such as COVID-19 patients, HWCs, people who lost relatives and to general population who required psychological support. In this framework, psychological interventions were articulated around two mainly objectives: containing distress and fear of the disease and intervening on adaptation difficulties. Thanks to a broader hospital institution, clinicians took advantage of a dedicated app “Huayitong” – developed by West China Hospital for registration, payment and other functions – to coordinate physicians and psychologists in a joint organization for consultation online through telephone hotline, WeChat and hospital apps. Through ICTs, it was possible to spread information about contagion prevention, to provide psychological interventions promoting self-psychological adjustment skills and to organize supervision and training for working group. Assessment and Prioritization was provided by the administration of online questionnaires in order to assess mental health status. This model proposed follow-up procedures among the entire target, with special attention to HCWs through Anticipated, Plan and Deter (APD) Responder Risk and Resilience Model. This included pre-event stress training and a focus on personal resilience planning.

The second model was developed in Southern Italy, concurrently when Italian Government declared the lockdown of the whole country in March 2020. The Mental Health First Aid Service of the Federico II University Public Hospital [26] was addressed to people at higher risk of psychopathological outcomes (i.e., HCWs, patients affected by Sars-Cov-2 or exposed to contagion) and to the general population. Psychological interventions were organized into four main areas (Fig. 1). The Management Area was designed for the bureaucratic service organization, involving procedures for online interventions and data processing. Operational and intervention meetings were held on video conferencing and WhatsApp group, in order to manage challenges from the different areas and share decision-making processes. Members of Clinical Area dealt with PFA interventions: users could reach for help through telephone hotline and email. Assessment and Prioritization were performed by clinical psychologists, while psychiatrists were available in case of individuals in psychopharmacological treatment, with high suicide risk or

previous psychiatric illness. PFA interventions were aimed on reducing distress through emotional containment and cognitive reframing, as well as promoting personal resources and self-psychological adjustment skills (e.g. guided breath focus, body scan).

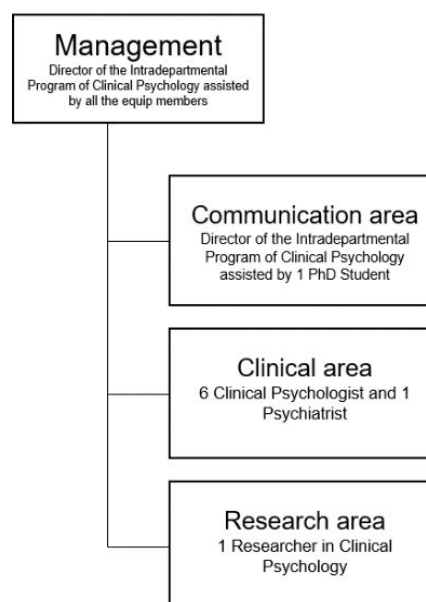


Fig. 1. Areas of the Mental Health First Aid Service of the Federico II University Public Hospital. Source: N.M. Maldonado et al. (2020)

The most recent model was developed at Leishenshan Hospital, a camp hospital built exclusively for COVID-19 in Wuhan, aiming at support inpatients [25]. This model included a combination of online and onsite interventions.

One psychiatrist on site coordinated 35 clinicians into an online mental health team: assessment and prioritization were provided by the psychiatrist, who used to meet patients in the ward and direct them to appropriate interventions. Through online chat groups – using personal smartphones – several psychological techniques were provided, such as psychoeducation, emotional regulation and individualized intervention in case of acute distress. Educational and support interventions were focused for HWCs to help them in their communication with inpatients.

In the light of these contributions coming from different contexts, ICT guaranteed continuity of telepsychological services, even during a period characterized by imposed social distancing due to the COVID-19 outbreak, thus making possible to meet users in a safe setting. Telepsychology could provide a base to reconfigure psychological interventions during pandemics. However, some criticalities may be mentioned. First, it is necessary to consider that a proportion of population could not be familiar with technology, due to lack in education, economic resources or old age [27, 28]. Second, this criticality is exacerbated by the fact there are not one-size-fits-all platforms: such a wide range of online platforms could be confusing for inexperienced users, even for

HWCs and psychologists involved in emergency interventions [29, 30]. Third, sudden lockdown measures could have prevented the implementation of adequate technology supports, given that health services may have been devoid of sufficient or powerful devices, informatic training and technical support. Fourth, assessment and prioritization processes can lead to biases, due to human error, workload, lack of information and moreover [31]. Furthermore, HCWs and mental health professionals are exposed to risk of contagion. Therefore, intervention models centralized on clinicians' coordination onsite, such as the Leishenshan Hospital model, could be exposed to high risk of interruption if the psychiatrist falls ill. The urgent nature of the intervention and the aforementioned critical points shed light on the need to optimize mental health services and telepsychological interventions with intelligent systems.

IV. FUTURE PERSPECTIVE BASED ON ICT IMPLEMENTATIONS

Since COVID-19 outbreak represented a drop-down phenomenon that putted a strain to worldwide population, it suddenly required a cogent reconfiguration of health care services, unready to face such a huge emergency. This crisis showed that all health care services should set up new protocols to manage a wide scale of remote interventions [32, 33]. However, the critical points emerged from Italian and Chinese models [24, 25, 26] shed light on several significant fields where ICT might be a solid contribution to optimize telehealth services and enrich the workflow. Over the last decades, scientific evidence has shown advantages of applying Artificial Intelligence for health care system [34, 35]. First, the application of ICT can create fast and interactive communication channels with population, leading health care systems to bidirectional exchange of information with users, i.e. exploiting follow-up and monitoring [36, 37], promoting adherence to medication, or facilitating diagnosis and data collection [38, 39]. During the outbreak, conversational agents resulted to be very efficient in allowing users to: (a) receive accurate information and prevent fake news spreading [1]; (b) self-report symptoms despite the fear of disease [40]; (c) reinforce preventive behaviors and strategies; and (d) reduce or prevent psychological consequences caused by outbreak countermeasures [7].

Psychological intervention models needing to quickly and effectively respond in emergency conditions can draw great inspiration from the integration of ICT, given that modern tools could speed up bureaucratic processes for health professionals, support augmentative communication with patients with disability [41, 42], support clinical decision-making processes [43] in a wide range of health applications, including triage, diagnosis, treatment, counseling, health promotion, and health care personnel training [44, 45]. The general availability of digital platforms through conversational agents may give people greater access to services and provide patient-centered treatment by the promotion of patients' participation in their health care and decision-making [7, 46]. Specifically, a conversational agent with on-line uploads could have work as a *gate keeper* in order to: (a) orienting population through the different support services, selecting at the entrance who were looking for psychological support from those who were in

special needs and searching for other community services (e.g. Civil Protection, Caritas); (b) performing a preliminary assessment through trained neural networks in order to collect data and manage online shared agenda, prioritizing high-risk populations. Although the current state of the art shows that conversational agents are still struggling to understand natural language and to engage in conversational flow [47, 48, 49], most recent tools – such as Google Duplex [50] – are proving to be promising interactive interfaces upon which to base a reconfiguration of telepsychology services. In this field, some encouraging evidence can be detected. First, conversational agents reduce impression management and increase self-disclosure in situations where fears of negative evaluation may be prominent with human partners [51, 52, 53]; moreover, employing an Artificial Intelligence as preliminary interlocutor – coherently with RAPID-PFA model – could affect stress and anxiety (40, 54) and improve social contact. Latest evidence suggests that virtual agents have the potential to reduce negative emotions like tension, painful feelings and frustration [55]. In the development of intelligent systems, it is therefore essential to make a specific effort about the agent's capacity to provide empathic responses, which have a significant role in many CogInfoCom protocols [56, 57u] where humans and Artificial Intelligence can be involved, such as emergency management.

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