A framework for risk stratification of burnout due to Covid-19 in nurses using personas" creation

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Background: Covid-19 pandemic has generated a huge amount of stress upon all healthcare workers, with an increased risk of developing burnout syndrome and Post Traumatic Stress Disorder (PTSD). Mobile health could provide tools for preventive interventions, whose efficacy could be improved by applying User-Centered Design (UCD) techniques to create personas to stratify the associated risk and tailor those interventions.

Purpose: We propose a framework for the definition of personas applied to an Italian nurse population to highlight different levels of risk relevant to burnout, anxiety, depression, and PTSD induced by Covid-19.

Methods: Data was gathered by web-questionnaire delivered to nurses in Italy between April and May 2020. Quantitative information about respondents' lifestyle, professional experience, impact of Covid-19 pandemic on both work conditions and personal life were collected, together with psychological indexes as Maslach Burnout Inventory (MBI), Impact of Event Scale (IES) and Patient Health Questionnaire (PHQ), used to define the risk level of burnout, PTSD, and anxiety and depression, respectively. Collected variables (55) were first reduced using Principal Component Analysis; then, k-medoids clustering with Partitioning Around Medoids algorithm was applied, where the best value of k was determined by silhouette and total within sum of square differences heuristics, together with evaluation from domain experts. Statistical analysis was applied to define which variables were able to differentiate among the k clusters, constituting the basis for the definition of a Persona card (i.e., a template with textual and graphical information) for each of the obtained clusters.

Results: From the 175 respondents nurses, a total of three clusters (personas) were identified. They presented very strong dissimilarities both in lifestyle and in how nurses reacted to the pandemic, showing distinct profiles associated to three different levels of risk of developing burnout and PSTD: the highest (representing 38.3% of all respondents), associated to a married nurse with children living with family, also using Personal Protective Equipment (PPE) at home, with workload highly impacted by COVID-19; the middle one, associated to an engaged nurse living alone with workload highly impacted by COVID-19; the lowest, associated to a married nurse living only with the husband/wife and wearing PPE at home, with workload moderately impacted by the pandemic. All personas showed a good amount of knowledge about burnout.

Conclusions: The application of the proposed framework to nurses showed three clusters that evidenced three risk profiles associated to different personas, each requiring distinctive treatment. This approach constitutes the first step for the development of tailored m-health interventions aimed at monitoring and preventing burnout and PTSD among healthcare workers in critical situations, such as the one provoked by Covid-19 pandemic.