Using Technology to Enhance Community Health and Territorial Resources Access

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Abstract. Improving access to health information and territorial resources can be a way to help strengthen health-related quality of life perception in disadvantaged communities. We argue that, in countries facing diverse economic and social disparities and challenges, technology can be leveraged to improve communities' access to evidence-based, up-to-date, comprehensive, and culturally appropriate supportive territorial resources, thereby improving individuals' quality of life, especially for those living with one or more chronic diseases. This paper discusses the benefits of introducing and designing a user-friendly, relevant, and effective web-based technology to broaden patients' access to healthcare resources and tailored health information, supporting community-based quality of life transformation.

Keywords. Healthcare, Territorial Resources, Evidence-based Care, Web-based Technology, Quality of Life.

1. Introduction

The significance of health-related quality of life (HrQoL) and its implications on community-based political and social decision-making, as well as on public health policies' propositions, are becoming increasingly prominent in various countries, especially after the Covid-19 pandemic [1]. There is an urgent demand to provide innovative healthcare services that include paradigm shifts and personalised care, considering individuals' needs not only as patients living with different morbidities but also as members of a community. Various technologies can be leveraged to improve the health and care of a population by taking advantage of territorial resources such as social development initiatives, employment opportunities, areas for physical activities and social communal spaces, among others that have the potential to impact on Quality of Life (QoL) and lead to an increase in empowerment and resilience [2]. The primary component of QoL is the individual subjective experience of well-being, which comprises physical, psychological, social, and spiritual aspects. According to the World Health Organization (WHO), QoL refers to the individuals' perception of their place in life, including culture, values, goals, concerns, and standards [3]. Accordingly, in 2021, WHO recognised the profound impact of social, cultural, economic, political, and environmental factors on both physical and mental health, which unfold not only the geographical aspect but encompass diverse national policies, social protection, living

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standards, working conditions and social support network, among others [4]. Specific population contexts (e.g., poverty, chronic morbidities, vulnerable population such as children, adolescents, elderly individuals and minorities exposed to violence, negligence, mistreatment, and/or discrimination) as well as exposure to conflicts and humanitarian emergencies, all can act significantly in detriment of mental health, changing the individuals' perception of wellbeing [2,5]. As a complex and multidimensional measure, with both subjective and objective domains, this work focuses on the multiple aspects that can modify HrQoL. Figure 1 illustrates a set of health related QoL according to the literature [6] with examples of risk factors.
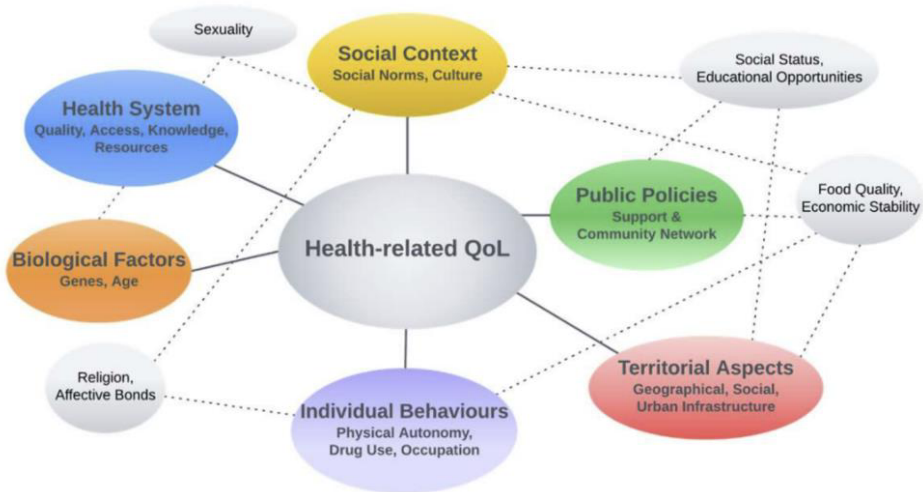

Figure 1. Risk factors impacting HrQoL perception and individuals' context into perspective.

There is extensive literature that discusses the relationship between elevated rates of psychological distress and various mental disorders with individuals' health status, which may interfere with their HrQoL perception and lead to an increased demand for healthcare services. Possible reasons for it include, for example, lack of mutual understanding between patient and physician, which can lead to frustration and confusion related to diagnoses, treatment and goals; prolonged symptoms of unknown origin or not explained by any known diagnoses; trouble managing self-care (more prevalent in older adults, low levels of education and presence of mental disorders); and people dealing with different social or economic issues on top of their health morbidities [7]. We, therefore, acknowledge that, by providing efficient, high-quality, comprehensive care and adequate social support to these individuals, it might be possible to improve their HrQoL. A viable instrument to support this goal is the design of a community-based digital tool that makes it easy to discover and access meaningful care resources in the community, such as territorial resources and evidence-based curated health information. In this paper, we discuss the views behind a supportive web-based online portal to facilitate social prescribing within a community or territory. The aim is also to reduce the burden on the healthcare teams dealing with recurrent patient issues by empowering individuals to seek and try alternative services and health assistance from other available well-being-focused services, rather than only following the traditional healthcare system for assistance and consultations.

2. A Healthcare Web-based Technology for Integrating Territorial Resources

Digital transformation in healthcare has been widely discussed, enforced, and studied for decades [8]. The advances in health technologies, for example, towards AI-powered decision support systems with user-centered technologies and personalised privacy-preserving mechanisms, bring a potent motivation to research communities in focusing on patients' empowerment and education through supportive tools in such a way they enable them to acquire a comprehensive understanding of their medical conditions and actively participate in personalised healthcare decisions. This research has a main case study in a Brazilian Primary Health Care gateway, focusing on health promotion, disease prevention, and harm reduction strategies, both on individual and population scopes [9]. Our goal is to work around the hypothesis that wider access to explained health-related topics and awareness of available alternative territorial resources for psychosocial support, through a user-friendly, relevant, and effective web portal, is a feasible and accessible strategy for health intervention towards improving HrQoL in disadvantaged communities. Figure 2 shows a potential web interface design for the proposed tool (originally in Brazilian Portuguese but here illustrated an English version).
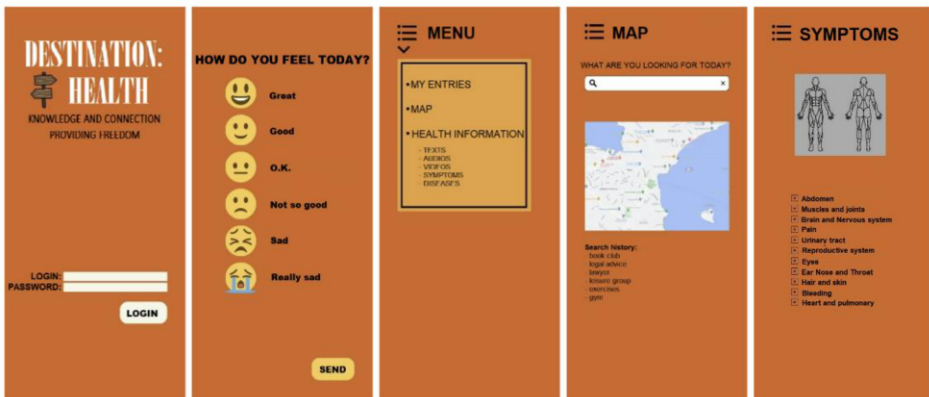

Figure 2. Illustration of user-friendly interfaces and basic functionalities for the web portal.

The research methodology involves a series of iterative participatory stages (patients, healthcare teams, community leaders), starting from (i) a systematic assessment of health determinants in a specific region, followed by (ii) the identification of high-quality care resources and tools that may establish and enhance psychosocial support networks. Resources may come from various sources, including the government, community initiatives, and third-party services; (iii) qualitative research with end-users' (public) opinion to understand the needs and functionalities required for such an efficient digital solution, (iv) design of a proof-of-concept (PoC) primarily based on the community members' perception of what HrQoL is and what can influence it, considering the territorial services' availability and ways of accessing these territorial tools of psychosocial support and evidence-based health information; (v) collection and analysis of end-users feedback regarding the practical relevance and social impact of the tool and their perceptions on HrQoL transformation.

3. Conclusion

The COVID-19 pandemic exposed the world to a humanitarian crisis with unprecedented impacts on mental, physical, and material circumstances, all which are potential risks factors for deteriorating mental health, well-being and QoL. Managing these challenges and their consequences is necessary, as they might remain for a long time, with high economic costs and social repercussions. Brazil, a large developing country characterised by significant social inequality, low levels of education, a humanitarian-cooperative culture and an already overloaded public healthcare system, must work towards establishing metrics and actions for estimating the impact of this last pandemic. In our ongoing work, we are defining a participatory study to engage end-users to evaluate the proposed web-based portal and collect their opinions on how using such technology can have an impact on their HrQoL. In practice, we plan to collect public perceptions on usability, accessibility, user engagement, information quality, and social impact in disadvantaged communities such as those located in the Southeast region of Brazil. With our research, we aspire to empower disadvantaged communities through accessible technologies for personal and territorial knowledge.

References

[1]   Ornell F, Schuch JB, Sordi AO, Kessler FH. "Pandemic fear" and covid-19: Mental health burden and strategies. Brazilian Journal of Psychiatry. 2020Apr3;42(3):232–5. doi: 10.1590/1516-4446-2020-0008

[2]   Aqtam, I et al. (2023). Quality of Life: Concept Analysis. Saudi J Nurs Health Care, Jan 2023;6(1):10-15. doi: 10.36348/sjnhc.2023.v06i01.003

[3]   World Health Organization, Mental Health and Substance Use Team. WHOQOL - measuring quality of life| The World Health Organization [Internet]. World Health Organization; 2012 [cited 2023Mar20]. Available from: https://www.who.int/tools/whoqol./

[4]   World Health Organization, Mental Health and Substance Use Team. Comprehensive Mental Health Action Plan 2013-2030 [Internet]. World Health Organization; 2021 [cited 2023Mar20]. Available from: https://www.who.int/publications/i/item/9789240031029.

[5]   National Academies of Sciences, Engineering, and Medicine. Social isolation and loneliness in older adults: opportunities for the health care system. Washington, D.C.: National Academies Press; 2020. doi: 10.17226/25663.

[6]   World Health Organization. Discussion Paper Series on Social Determinants of Health 2. A conceptual framework for action on the Social Determinants of Health [Internet]. World Health Organization; 1970 [cited 2023Mar20]. Available from: https://apps.who.int/iris/handle/10665/44489.

[7]   Kivelä K, Elo S, Kääriäinen M. Frequent attenders in Primary Health Care: A concept analysis. International Journal of Nursing Studies. 2018Jun6; 86:115–24. doi: 10.1016/j.ijnurstu.2018.06.003

[8]   Kraus S, Schiavone F, Pluzhnikova A, Invernizzi AC. Digital transformation in healthcare: Analyzing the current state-of-research. Journal of Business Research. 2021Feb;123:557–67. doi: 10.1016/j.jbusres.2020.10.030.

[9]   Macinko J, Harris MJ. Brazil's Family Health Strategy — delivering community-based primary care in a universal health system. New England Journal of Medicine. 2015;372(23):2177–81. doi: 10.1056/NEJMp1501140.