

The Importance of Health Informatics in Public Health during a Pandemic

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Campus Mental Well-Being: Opportunities for Digital Health

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Abstract. This paper aims to understand the student campus mental health, mental well-being and mental wellness ecosystem by systematically identifying and synthesizing research reporting initiatives using these terms. It identifies the differences and similarities in usage to identify digital health opportunities.

Keywords. Mental health, mental well-being, mental wellness, digital health

1. Introduction

The prevalence of mental disorders such as anxiety and depression are on the rise. Australian youth between the age of 18 and 24 has the highest prevalence rate of mental illness [2]. Current mental health models of care are struggling to cope with the increase in the demand for mental health services and this creates a demand that exceeds supply especially in acute care settings. This situation is driving the need for reconceptualization of the mental health service ecosystem including exploring opportunities for intervention inherent when end-user applications interact with IT infrastructure in formal environments such as schools, universities and workplaces. For example, a student on campus, connected to the campus Wi-Fi network, broadcasts a unique MAC address which is identifiable to the network and could be used to count the number and types of services connected. Similarly, browsing activities can be analyzed to deduce any characteristics of search terms that may give insight into student well-being. Understanding population level student behaviors would enable the development of systems level interventions to reduce the strain on the stressed mental health service provision and create wellness-based environments. Understanding the landscape of campus initiatives and the different terminologies such as mental health, mental wellness and mental well-being is a precursor to identifying opportunities for digital health. The success of digital health interventions in campus environment is dependent on collaboration from multidisciplinary teams who may associate their initiatives using the different terminologies, cognizant that engaged students are likely to have better academic success [8] and are likely to remain enrolled in their studies (retention) [16].

The World Health Organization (WHO), defines mental health as a state of well-being in which every individual realizes his or her own potential, can cope with the

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normal stresses of life, can work productively and faithfully and is able to make a contribution to her or his community [17]. The Oxford dictionary defines well-being as ‘the state of being comfortable, healthy or happy’ and defines wellness as ‘the state of being in good health, especially as an actively pursued goal’. These definitions show the interconnected of these terms, therefore, addressing the state of one would address the state of the others. This study investigated this interconnectedness in the campus ecosystem by systematically identifying and synthesizing research reporting initiatives in these areas to identify digital health intervention opportunities.

2. Method

In April 2020, a systematic investigation, using the Web of Science database, was undertaken using the search terms ("mental health" OR "mental wellness" OR "mental wellbeing" OR "mental well-being" AND "student" AND "campus").

2.1 Review inclusion criteria

The inclusion criteria was: (1) Population: students at university or college (2) Document type: articles or proceeding papers (3) Outcome: Initiatives to improve student mental health, student well-being or student wellness (4) Language: English (5) Timespan: five years. Studies were excluded if the student population were not in campus and if the student population were below the age of 18 years.

2.2 Article screening and data analysis

Article titles and abstracts were reviewed for potential inclusion and duplicates were removed. Studies were excluded if they did not meet the ‘*Review inclusion criteria*’. Semantics of the included articles were explored using NVivo's™ word frequency search with the following criteria: (1) 1000 most frequent words (2) minimum length of five letters.

3. Results

The search identified 2313 articles. Thirteen full text articles met the inclusion criteria. These were categorized into three categories: mental health [3-5; 11] mental well-being [9-16] and mental wellness [10]. Synthesized results are presented descriptively in Table 1. There were only two digital health interventions (Article 11 and Article 13).

Table 1. Campus mental health, mental wellness and mental wellbeing initiatives

Articles	Study outcome/Findings	Study design, country & sample size
Article 1 [11]	Recommendation to raise awareness, counselling, establish drop-in centers, promote recreational and recreational activities	Cross-sectional study in Northern Tanzania (n=402)
Article 2 [5]	Feasibility and acceptability of on campus mental health screening and early intervention program associated with improvements in resilience-related capacities and symptom reduction	Single arm, prospective study evaluating outcome of a 4 week intervention workshop in United States (n=63)

Article 3 [4]	Outreach initiatives capturing trends in service utilization providing insight into programming for future service and outreach initiatives	Longitudinal study survey in Canada (n=3,734)
Article 4 [3]	Campus based interventions needed to promote mental healthcare utilization	Web-based survey in South Africa (n=1402)
Article 5 [13]	Implementation of emotional intelligence programs contribute to the development and improvement in students' Emotional Intelligence	Meta-analysis of 20 eligible articles
Article 6 [7]	Involvement in school organizations was correlated to depression levels, general positive affect and life satisfaction. Social interactions were related with quality of life.	Quantitative, cross-sectional, descriptive, correlational design, survey in Philippines (n=249)
Article 7 [6]	Poor mental health in medical students and recommendation for steps to put in place to support these students	Online survey in Morocco (n=637)
Article 8 [1]	High levels of mental distress in medical student, interventions needed to improve mental health	Survey in Portugal, (n=622)
Article 9 [15]	High Factor Model (HFM) factors: erudition, peace, cheerfulness, honesty and tenacity are related to psychological variables (well-being or psychopathological symptomatology) and academic performance (adjustment and achievement)	Survey in Argentina, (n=256)
Article 10 [14]	Social media as a risk factor for mental health struggles	Survey in United States (n=546)
Article 11 [12]	Efficacy of biofeedback digital intervention in reducing self-reported anxiety and increasing perceived wellbeing	Randomized, wait-list controlled, trial in United Kingdom (n=262)
Article 12 [9]	Improving mental health through bridge network (peer support for students)	Case study, co-design process in United Kingdom (n=7)
Article 13 [10]	Online modules as a good start for coach education about mental health	Survey in US, (n=969)

Despite the different focus in each of the categories, mental health is a theme that consistently appeared in every category. The results highlight that students are hesitant to disclose mental health problems because of the negative stigma attached [16] to it.

4. Discussion

Well-being and wellness focused digital health researchers should be cognizant to include mental health focused stakeholders for a holistic contribution. Analyzing the semantics of included articles is an effective way to investigate the interconnectedness of initiatives. Digital health initiatives can converge the multidisciplinary teams driving research behind the disparate terminologies to deliver campus wide improvements to students' well-being. Innovative interventions such as anonymous virtual mental health services and providing free subscriptions to apps are examples to explore.

5. Conclusions

The approach taken at campuses are different from acute care settings where the term mental health refers to treating an illness. On campus interventions are focused on the delivery of non-pharmacological programs closely related to holistic approach of

wellness and well-being. This review shows that there is a huge contribution to be made by digital health researchers. The stigma attached to mental health presents opportunities for interventions using surrogate measures relevant to campus such as student engagement and student retention which can be anonymously analyzed when end-user applications interact with campus IT infrastructure.

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