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JMIR Biomedical Engineering | Using Machine Learning to Reduce Treatment Burden

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JMIR Publications recently published "*Reducing Treatment Burden Among People With Chronic Conditions Using Machine Learning: Viewpoint*" in JMIR Biomedical Engineering which reported that the COVID-19 pandemic has illuminated multiple challenges within the health care system and is unique to those living with chronic conditions.

Recent advances in digital health technologies present opportunities to improve quality of care, self-management, and decision-making support to reduce treatment burden and the risk of chronic condition management burnout.

There are limited available eHealth models that can adequately describe how this can be carried out.

In this paper, the JMIR Biomedical Engineering authors define treatment burden and the related risk of affective burnout; assess how an eHealth enhanced Chronic Care Model (CCM) can help prioritize digital health solutions; and describe an emerging machine learning model as one example aimed to alleviate treatment burden and burnout risk.

They propose that eHealth-driven machine learning models can be a disruptive change to optimally support persons living with chronic conditions, citing One Drop ML algorithms as an example that informative biometric predictions based in part on behavioral inputs exist today.

Dr. Dan Goldner, EVP of advanced technologies research & discovery at One Drop said, "*The COVID-19 pandemic has surfaced multiple concerns present within our health care systems, including the high infection risk prevalent among people with chronic conditions, and the fact that practitioners can only provide specialized responses to acute illnesses.*"

These, in turn, leave people with chronic conditions to experience fragmented, poorly coordinated, and limited support in their treatment, which exacerbates the treatment burden patients experience as they encounter decreased support for their ongoing medical care.

Considered the most efficacious of the various chronic illness frameworks, the CCM addresses how health care teams, including physicians, can better support those with chronic conditions by shifting care focus to coordinated self-management and decision-making support.

eHealth supports individuals in self-care and facilitates interactions and collaboration within the health care system, thereby reinforcing the value of the CCM.

The eHealth enhanced CCM, developed in 2015 by Gee et al, is a framework that incorporates eHealth literature into the CCM components and promotes understanding how eHealth tools such as mobile health apps, machine learning, e-communities, electronic health records, and eHealth education may facilitate the implementation of the CCM in a digital space.

Of the suggested technologies, machine learning offers new opportunities to deliver more accessible, equitable, personalized, and cost-efficient chronic care programs. Machine learning may help mitigate treatment burden and burnout risk by providing self-management and decision-making interventions that guide and support people with chronic conditions.

Dr. Goldner and the research team concluded in their JMIR Publications Research Output that machine learning–based biometric predictions used in the context of established behavior change frameworks offer exciting potential to support and reduce treatment burden, as well as mitigate burnout risk for those living with chronic conditions, like diabetes.

Chronic care management requires constant attention, which necessitates deep engagement with supportive tools.

eHealth solutions such as the outcomes model may break down the boundaries that define traditional, non digital care.

Such innovation should support digital health care's progression out of reactive and into proactive chronic care.

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