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Preliminary Results of a Grounded Theory Study on Using Mobile Health for Physical Activity

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Abstract. As the first stage of substantive theory building, this study explored the behavioral responses of people with long-term weight concerns using mHealth to increase their physical activity within a New Zealand context. A constructivist grounded theory method was adopted. Twenty-two participants with long-term weight concerns and personal experience using mobile health to increase physical activity participated in in-depth interviews. Four themes and eight categories were conceptualized: motivation, physical activity behavioral responses, mobile health evaluation, and social interaction. The role of mobile health in increasing physical activity and improving overall wellness is broadly acknowledged and facilitates, to some extent, the social interactions among family, friends and the wider community.

Keywords. Mobile health, physical activity, weight, grounded theory method

1. Introduction

Increasing physical activity (PA) has been indicated to substantially alleviate the risk of premature mortality from non-communicable diseases, making it a crucial component of lifestyle interventions [1, 2]. Known benefits also include enhanced mental health, quality of life, and overall well-being, and it helps reduce the prevalence of excess weight issues, which are a concern internationally and in New Zealand [3, 4]. PA is a complex and dynamic behavioral state that varies in accordance with an individual's unique habits. Therefore, a generic theoretical model of behavior intervention fails to take into account the complexity and specificity of various contexts [5]. Mobile health (mHealth) has become more widely used over the last two decades and it provides a cost-effective alternative to traditional weight-loss programmes for those who need support losing weight but cannot otherwise achieve it [6]. Current qualitative studies have mostly focused on users' preferences and experiences on the functional features of mHealth in weight management [7-11]. In-depth, substantive, grounded theory (GT)

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based research may provide a better understanding of how to use mHealth to support PA and improve the acceptance, engagement, and effectiveness of mHealth. Based on the above arguments, a conceptual framework grounded in the experiences of adults in New Zealand who have used mHealth in an attempt to lose weight and/or shape PA habits should have the potential for application, both locally and internationally.

2. Methods

The key factor contributing to the design of this study is the aim of exploring the nature of using mHealth to support PA from the point of view of people who want to lose weight. A constructivist grounded theory method (GTM) fits epistemologically and with a focus on social processes [12]. Potential participants were purposively selected based on the research question - What is the nature of people's perspectives and actions in using mHealth for PA within their social context? Participants aged over 18 years, identify themselves as having long-term weight issues or concerns, are able to recall their experiences or perspectives of using mobile technology to engage in PA, are able to speak English, and have lived in New Zealand for at least six months were identified as a suitable initial sample.

Initial sampling was collected via advertising recruitment based on physical posters, social media/website blurbs, and snowball sampling. Those interested to participate were guided to complete an online registration process and were formally invited by email after passing an initial screening. Participants were interviewed face-to-face or online using a semi-structured approach between August and November 2022. Ethical approval was obtained for this study (Reference: UAHPEC23834). Each interview was transcribed verbatim and processed using NVivo 2020. Care was taken to remove any personally identifying information to protect the privacy of participants. An iterative inductive coding procedure was used to analyze each interview [12]. Sampling and analysis stopped after 22 interviews when theoretical saturation was reached [12, 13].

3. Results

Demographic data showed a predominance of female participants; ages ranged from 18 to 61 years; 11 reported having a body mass index of 25.0 or above. Most participants kept track of their PA with at least two techniques and lasted more than one year. Participants rated mHealth's success at increasing PA and improving wellness at 62.64 (SD=21.32). Key concepts were classified into four thematic dimensions, i.e., motivation, PA behavioral responses, mHealth evaluation, and social interaction.

Motivations are categorized as intrinsic and external factors. An individual's intrinsic motives are the primary power of behavior, which include weight-related wellness perception and a sense of lifestyle change. Participants all described a prolonged, multifaceted wellness perception (e.g., concerns about weight, effects accompanying weight loss, and impact on overall wellness). Most participants mentioned they intended to keep their weight within a healthy range by engaging in PA and creating healthier lifestyle habits. Participants' attitudes toward mHealth determined their external factors. Participants generally endorsed the development and accessibility of mHealth technologies for tracking PA. Notably, mHealth provided a

major external contribution to people's home-based PA monitoring during the Covid-19 lockdown.

The process of using mHealth to support PA was a dynamic continuum. This was conceptualized as participants adopted diverse behavioral responses and represented different levels in terms of mHealth engagement stability and PA participation outcomes. Behavioral responses were categorized into routine formation and behavioral conflicts. Forming PA routines were described as tracking PA progress to keep motivated, creating a personalized PA plan based on previous record keeping, and establishing a doable, sequential PA mode. However, this process appears not to be linear; conscious intent (e.g., not wanting to remain immobilized), incident encounter (e.g., having a weight loss plateau), situational shifts and uncontrollable variables (e.g., seasonal change, pandemic lockdowns) affected behavioral responses from time to time, leading to changes in behavior. Participants' perceived conflicts between goals and actual actions frequently arose in their experience of forming PA routines. In this context, behavior change often ensues as a supplemental way to enrich their PA routine. For instance, leveraging mHealth resources can improve motivation and help reformulate an actionable PA plan. Some participants reported a desensitization effect. Although mHealth was considered a motivator for PA participation, after establishing certain behavioral routines, they chose not to be reliant on using mHealth to monitor their PA. Still, the behavior was retained and potentially had a lingering influence on lifestyle habits.

Most participants conveyed a favorable stance towards a high acceptance of mHealth, better mastery of general use, incorporation of mHealth into PA behavioral routines, and increased intrinsic motivation to be physically active. However, they also adopted a skeptical posture toward the possible risks associated with an electronics-based approach. These risks involve the susceptibility to mHealth addiction or abuse, the possibility of increased psychological strain and weariness, lack of tailoring of mHealth interventions for multicultural equity, and the skepticism of validity and reliability of mHealth measurements.

Engagement in mHealth seems to be reinforcing and providing opportunities for people to interact in their social context and can help establish positive interconnection. Some participants described their PA interaction as not being a solitary journey. Family and close friends tended to be the most involved parties. From neutral to positive responses were mentioned when participants attempted to share their preferred mHealth activity with family or close friends. When participants talked about whether they would be open to posting their PA outcomes publicly, few participants expressed interest. More participants were concerned about the potentially harmful nature of social media, and they indicated that their use of mHealth was private and they did not want to be judged. Despite this aversion to mHealth and sharing data via social media, a few alternative instances were discussed. For example, creating healthy PA competitions and sharing PA progress among peers was considered acceptable by some participants.

4. Discussion

PA behavioral responses identified in this study suggest a unique theoretical dimension that could provide additional insight for further explanatory theoretical depth. Notably, changes in behavior are inevitable and are mediated by a multiplicity of variables. This

aligns with literature that suggests measuring one's ability to make changes to PA routines at a certain moment can keep them going over time [5]. Consistent with previous qualitative studies [7-10], individuals generally perceived the role of mHealth in providing support for PA to be favorable, specifically as reflected by the function (e.g., reminding notifications, providing data, syncing between devices) and feature (e.g., portability, user-friendly, accuracy) characteristics. Different insights have emerged on the connection between people's use of mHealth for PA participation and social interaction. Few participants were comfortable publicly disclosing their PA outcomes, particularly on social media. This concern about social media has been noted by other research [8, 14, 15]. Furthermore, this study suggests that creating peer social sharing seems an acceptable middle ground that enables individuals to have social interactions that are prone to empathy and lead to more active PA participation [7, 14].

5. Conclusions

The results of this study provide a preliminary conceptualization framework for proposing a researcher-constructed substantive GT. We will delve further into the current findings to inform a second round of convergent interviewing and theoretical sampling applied to the in-depth theory-building process.

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