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WILDCAM: EFFECTS OF VIDEO OBFUSCATION ON THE ACCEPTABILITY OF WEARABLE CAMERAS

Nabil Alshurafa, PhD[1], Christopher Romano, BS[1], Glenn Fernandes, MS[1], Mahdi Pedram, PhD[2], Angela F. Pfammatter, PhD, FSBM[3]

[1]Northwestern University, Chicago, IL; [2]DePaul University, Chicago, IL; [3]The University of Tennessee, Knoxville, Knoxville, TN

Background: Obesity treatment would benefit greatly from real-time monitoring of problematic eating behaviors in real-world settings. Wearable cameras provide significant utility in automatically detecting and understanding eating behaviors, yet pose major privacy concerns in real-world settings, significantly impacting longitudinal wear adherence. We objectively assess the wear time of three different video obfuscation methods in a crossover clinical trial to determine the greatest acceptability and feasibility, compared with no obfuscation. Lessons learned from this study have the potential to inform the design of privacy-conscious wearable devices that individuals with obesity will adhere to and that can accurately detect eating, which will advance our understanding of behavioral phenotypes surrounding obesity, laying the foundation for future timely interventions to reduce problematic eating behaviors.

Methods: 30 participants wore a wearable camera for 2 free-living weeks with no explicit daily wear time requirement and reviewed clips of their video data each night. During 1 of the 2 weeks, participants' clips were obfuscated by one of three randomly assigned methods (pixel blurring, pixel masking, and cartoon masking). The order of obfuscation and non-obfuscation weeks was counterbalanced across participants. The mean device wear times across each obfuscation method were compared to analyze the effect of each method on user adherence to the wearable camera. A one-way ANOVA was performed to evaluate the relationship between obfuscation methods and wear time. Post-study interviews were conducted to assess user attitudes towards their assigned obfuscation methods.

Results: Out of 30 participants, 17 completed the study. ANOVA was not significant between groups (α=0.5, F=0.62, df=3, p=0.60). However, the cartoon masking method resulted in the highest mean wear-hours per week with 40.8 hours (SD=25.9), followed by pixel masking with 36.7 hours (SD=23.6), no obfuscation with 29.5 hours (SD=20.8), and, lastly, pixel blurring with 24.4 hours (SD=7.9). Cartoon obfuscation resulting in greatest adherence aligned with post-study interviews in which participants reported that superimposed avatars were extremely effective at obscuring sensitive and/or identifiable information. Participants did report that size and weight of the device impacted their wear time.

Conclusions: Our results suggest that cartoon masking may be more effective of the tested methods at assuaging privacy concerns regarding wearable cameras and thus increasing user adherence. Reasons for the lack of significance may be the low sample size, the weight and size of the device, and informing participants that they could take off the device any time. Future studies would benefit from using wear time as an objective method for assessing acceptability and should consider the lessons learned from WildCam.

CORRESPONDING AUTHOR: Nabil Alshurafa, PhD, Northwestern University, Chicago, IL; nabil@northwestern.edu

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PREDICTING FAMILY CAREGIVERS' USE OF & BENEFIT FROM AN INTERNET INSOMNIA INTERVENTION: RESULTS OF A SINGLE-GROUP CLINICAL TRIAL

Kelly M. Shaffer, PhD[1], Lee M. Ritterband, PhD[2], Wen You, PhD[3], Meghan K. Mattos, PhD, RN[3], Daniel Buysse, MD[4], Jillian V. Glazer, BA[5], Julie Klinger, MA[6], Heidi S. Donovan, PhD, RN[7]

[1]University of Virginia School of Medicine, Charlottesville, VA; [2]University of Virginia Center for Behavioral Health & Technology, Charlottesville, VA; [3]University of Virginia, Charlottesville, VA; [4]University of Pittsburgh, Pittsburgh, PA; [5]Center for Behavioral Health & Technology, University of Virginia, Chapel Hull, NC; [6]The University of Pittsburgh, Pittsburgh, PA; [7]University of Pittsburgh School of Nursing, Pittsburgh, PA

Objectives: Family caregivers experience insomnia more frequently than the general population. Internet-based insomnia programs show robust treatment effects, yet caregivers may have more difficulty adhering to and benefitting from such programs relative to non-caregivers. This trial examined to what extent caregivers' engagement with and outcomes from an empirically-validated Internet insomnia program developed in the general population are influenced by their caregiving context.

Methods: Individuals who reported insomnia and providing unpaid time- and responsibility-intensive care (N=100; age M=52.82, 87% female, 75% non-Hispanic white) were enrolled in a fully-powered, single-group trial of SHUTi (Sleep Healthy Using the Internet), which has no caregiver-specific tailoring. The primary aim of this trial was to test whether caregivers' engagement with the program differed according to caregiving context variables. At baseline, caregivers reported their caregiving context and sleep, followed by 10 daily online sleep diaries. Caregivers then received SHUTi access for 9 weeks, followed by post-assessment (questionnaires, diaries). Engagement with SHUTi was logged by the program.

Results: Sixty caregivers completed SHUTi, 22 initiated SHUTi but did not complete it, and 18 did not initiate it. Those caregivers who used SHUTi (n=82) showed medium to large improvements across sleep outcomes. Logit regression models showed that caregivers for care recipients (CR) with worse functioning were more likely to initiate and complete SHUTi; also, caregivers supporting more CR activities of daily living (ADL) were more likely to complete SHUTi (*ps*< .03). Regression models controlling for SHUTi engagement showed that caregivers supporting more instrumental ADL (IADL) reported less improvement in external sleep locus of control and insomnia severity; caregivers reporting higher guilt reported more improvement in wake after sleep onset (WASO), number of wakings, sleep quality, and total sleep time; caregivers for CR with more problem behaviors reported more improvement in WASO; and caregivers who were bedpartners with the CR reported more improvement in sleep onset latency relative to caregivers who did not live with the CR (*ps*< .05).

Conclusions: Higher-intensity caregivers showed substantial treatment benefits from a fully-automated Internet insomnia program. Excepting IADLs supported, factors typically associated with greater caregiving burden like greater CR impairment and caregiving guilt were associated with better engagement and outcomes. Findings suggest that even caregivers with substantial burden can engage with and benefit from fully-automated insomnia programs without tailoring to the caregiving context.

CORRESPONDING AUTHOR: Kelly M. Shaffer, PhD, University of Virginia School of Medicine, Charlottesville, VA; kshaffer@virginia.edu