

INPLASY PROTOCOL

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Review Stage at time of this submission: Formal screening of search results against eligibility criteria.

Ethical implications of applied digital gaming interventions for mental health: a systematic review and critical appraisal

Pavarini, G¹; Reay, E²; Smith, LM³.

Review question / Objective: What are the ethical and practical considerations of gaming interventions in mental health? What existing viewpoint, commentary or theoretical points have been made in the literature regarding ethical issues in the development of serious games? What benefits and risks of games development in mental health are discussed in the literature? How are the core healthcare ethical principles of beneficence, non-maleficence, autonomy and justice discussed as relating to applied games in mental health? How might this information inform future thinking regarding the ethical development of serious games in mental health?

Information sources: The search was conducted across four electronic databases covering science and arts and humanities titles: Scopus, PUBMED, PsycNET, EthxWeb and additionally, the journal, Game Studies, which contrary to other gaming journals does not exist in any of these databases. Given the recency of games design in this area, the search was limited to the preceding 30-year period, til January 2023, where available.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 09 March 2023 and was last updated on 09 March 2023 (registration number INPLASY202330035).

INTRODUCTION

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development of serious games? What benefits and risks of games development in mental health are discussed in the literature? How are the core healthcare ethical principles of beneficence, non-maleficence, autonomy and justice discussed as relating to applied games in

mental health? How might this information inform future thinking regarding the ethical development of serious games in mental health?

Rationale: The industry for serious games in mental health is growing apace, with the first examples of therapeutic games receiving US and UK regulatory agency approval within the last few years. The potential in gamification and applied games technologies in mental health has been widely lauded, yet there has been scant consideration in the literature of ethical issues associated with this important development within the field of digital interventions for mental health. A search of the available systematic review registries indicated no prior review of this area. The current review aimed to complete a search for existing data and considerations in the literature on the ethical implications of digital gaming interventions for mental health, and to offer a critical appraisal of issues to inform ethical practice in games development in this sector in the future.

Condition being studied: The paper will discuss the design, research or application of applied gaming interventions in mental health. This includes discussions of implications of gaming interventions for particular mental health difficulties (e.g. suicide, depression, eating disorders), social and emotional difficulties (e.g., emotion recognition), neurodevelopmental conditions (ADHD and Autism), and experiences that are directly relevant to mental health (e.g., violence, abuse). Papers that focus on gaming applications in cognitive or neurodegenerative conditions, physical impairment or games for physical health will be excluded. Papers that discuss mental health or societal implications of gaming in general, outside a mental health intervention context (e.g., addiction to video games or gaming and violence) will be excluded.

METHODS

Search strategy: Manuscripts covering a combination of three main concepts in the

title or abstract: ethics, games and mental health will be included. The search strings used are shown below:

PUBMED:

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((("mental health"[Title/Abstract] OR
"wellbeing"[Title/Abstract] OR
"psycholog*"[Title/Abstract] OR
"psychotherapy*"[Title/Abstract] OR
"mental illness"[Title/Abstract] OR
"therap*"[Title/Abstract] OR
"psychiatr*"[Title/Abstract] OR "mental
illness"[Title/Abstract] AND
((bookdocs[Filter] OR review[Filter] OR
systematicreview[Filter])) AND
("game*"[Title/Abstract] OR "serious
games" OR "gaming"[Title/Abstract] OR
"virtual reality"[Title/Abstract] OR
"VR"[Title/Abstract] OR "augmented
reality"[Title/Abstract] OR "AR"[Title/
Abstract] OR "gamif*"[Title/Abstract] OR
"edutainment"[Title/Abstract] AND
((bookdocs[Filter] OR review[Filter] OR
systematicreview[Filter])) AND AND
("ethic*"OR "risk" OR "benefit" OR
"challenge" OR "potential" OR "limitation*"
OR "opportunit*" OR "critic*" OR
"consideration" OR "philosophy" OR
"moral*" AND ((bookdocs[Filter] OR
review[Filter] OR systematicreview[Filter])
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APA PsycNET

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((("mental health" OR "wellbeing" OR
"psycholog*" OR "psychotherapy" OR
"mental illness" OR "therap*" OR
"psychiatr*") AND ("game*" OR OR
"serious games" OR "gaming" OR "virtual
reality" OR "VR" OR "augmented reality"
OR "AR" OR "gamif*" OR "edutainment")
AND ("ethic*" OR "risk" OR "benefit" OR
"challenge" OR "potential" OR "limitation"
OR "opportunit*" OR "critic" OR
"consideration" OR "philosophy" OR
"moral"))
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SCOPUS

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TITLE-ABS ("ethic*" OR "benefit" OR
"challenge" OR "potential" OR "limitation*"
OR "opportunit*" OR "critic*" OR
"consideration" OR "philosophy" OR
"moral*" ) AND TITLE-ABS ( "mental
health" OR "wellbeing" OR "well-being" OR
"psycholog*" OR "psychotherapy*" OR
"cybertherapy" "mental illness" OR
"therap*" OR "psychiatr*" OR "mental
illness" ) AND TITLE-ABS ( "game*" OR
"serious games" OR "gaming" OR "virtual
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reality" OR "VR" OR "augmented reality" OR "AR" OR "gamif*" OR "edutainment" OR "digital" OR "E-health" OR "game*" OR "serious games" OR "gaming" OR "virtual reality" OR "VR" OR "augmented reality" OR "AR" OR "gamif*" OR "edutainment")
We also searched Ethx Web and the journal, Game Studies.

Participant or population: The review covers the application of gaming interventions in mental health (see above for details on conditions) for both children and adults. No restrictions were made on the population (eg, clinical vs. general population; age group) or setting (eg, clinical, schools) being discussed.

Intervention: The study will evaluate applied gaming interventions in mental health. No restrictions were made on the type of applied game or gamified tool, including desktop games, mobile apps, individual or multiplayer role play games, games employing Virtual Reality or Augmented reality, commercial off-the-shelf games and bespoke serious games. Papers discussing non-digital games (board games, escape rooms) or Virtual or Augmented Reality technologies without specific reference to applied digital gaming aspects were not included.

Comparator: N/A

Study designs to be included: Study designs to be included: reviews, meta-analysis, theoretical piece, commentary, viewpoint or other empirical contribution. Single empirical studies that aimed to test the efficacy of gaming interventions were excluded, however review papers of empirical studies were included.

Eligibility criteria: The paper was available in English. The paper was published in a peer reviewed journal. Preprints, theses, dissertations or unpublished reports and book chapters were not included. The paper discussed the risks and benefits of applied gaming interventions, anywhere in the manuscript, making at least two distinct points.

Information sources: The search was conducted across four electronic databases covering science and arts and humanities titles: Scopus, PUBMED, PsycNET, EthxWeb and additionally, the journal, Game Studies, which contrary to other gaming journals does not exist in any of these databases. Given the recency of games design in this area, the search was limited to the preceding 30-year period, til January 2023, where available.

Main outcome(s): Full texts were reviewed for content as regards the risks and benefits of applied games in mental health and any other points raised related to the core healthcare ethical principles of beneficence, non-maleficence, autonomy and justice, or broader ethical themes. A broad categorization was used to extract ethical points from papers in terms of benefits (positives) and risks (negatives), and 'other' general ethical considerations.

Additional outcome(s): Information regarding the types of gaming addressed by the paper and the mental health population were extracted for analysis.

Data management: Records were exported and combined for processing using Microsoft Excel.

Quality assessment / Risk of bias analysis: Following McCoulough et al. 2004, we will employ a formal tool for critically appraising medical ethics literature. The tool involves 4 questions about normative medical ethics papers: (1) Does the article address a focused ethics question? (2) Are the arguments that support the results of the article valid? (3) What are the results? (4) Will the results help me in clinical practice?

Strategy of data synthesis: Records were screened at title and abstract for inclusion in full text review. Databases were screened initially as follows – Author GP screened titles from Scopus and EthxWeb. Author ER screened titles from PsychNET and Game Studies, Author LS screened titles from PubMed.

A random sample of 20% of all papers were co-rated by a separate author, for title/abstract screening of eligibility criteria and inclusion in full text review.

Decisions on full text inclusion were made collectively by all authors.

Full texts were reviewed for content as regards the risks and benefits of applied games in mental health and any other points raised related to the core healthcare ethical principles of beneficence, non-maleficence, autonomy and justice, or broader ethical themes.

A random sample of 30% of included full texts were co-rated for data extraction regarding ethical considerations by a separate author.

Subgroup analysis: N/A.

Sensitivity analysis: N/A.

Language restriction: English language.

Country(ies) involved: United Kingdom.

Other relevant information: Oxford University is the lead institution for the UKRI (MRC/AHRC/ESRC) Adolescence, Mental Health and the Developing Mind Programme. Grant number: MR/W002183/

Keywords: ethics, digital gaming, applied games, mental health, wellbeing, risks and benefits.

Dissemination plans: We intend to publish the results in a peer reviewed journal.

Contributions of each author:

Author 1 - Gabriela Pavarini - Author Pavarini has provided ethics intellectual input to the design and search strategy for the study. She has/will have completed components of the search process, the data extraction process and the reliability checking. Author Pavarini will complete a first draft of the manuscript and assist in editing.

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Author 2 - Emma Reay - Author Reay has provided games intellectual input to the design and search strategy for the study. She has/will have completed components

of the search process, the data extraction process and the reliability checking. Author Reay will assist in drafting and editing the final manuscript.

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Author 3 - Lindsay Smith - Author Smith has provided mental health intellectual input to the design and search strategy for the study. She has/will have completed components of the search process, the data extraction process and the reliability checking. Author Smith will assist in completing a first draft of the manuscript and editing.

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Conflicts of interest: The authors certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this study.