Biopsychosocial Factors of Gaming Disorder:

Qualitative Review

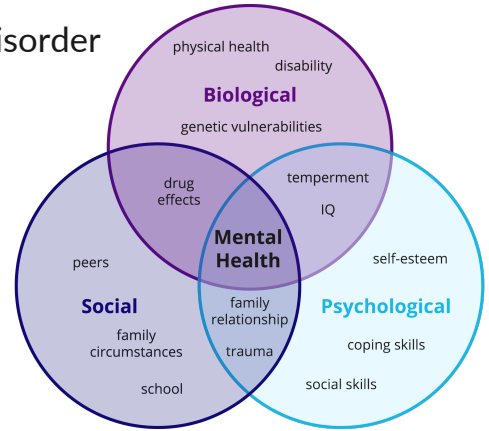
Rose Chang, Minju Lee

2021/04/23

Table of Contents

Background/Purpose (recap)

- **Ultimate question: Shoud/Can we classify gaming disorder as a disease?**
- Sub-question: Are existing scientific evidence for listing gaming disorder as a disease adequate/valid?
- Our project: qualitative review on biopsychosocial factors of gaming disorder
  - Causes/consequences/correlates of gaming disorder



Search Process (recap)

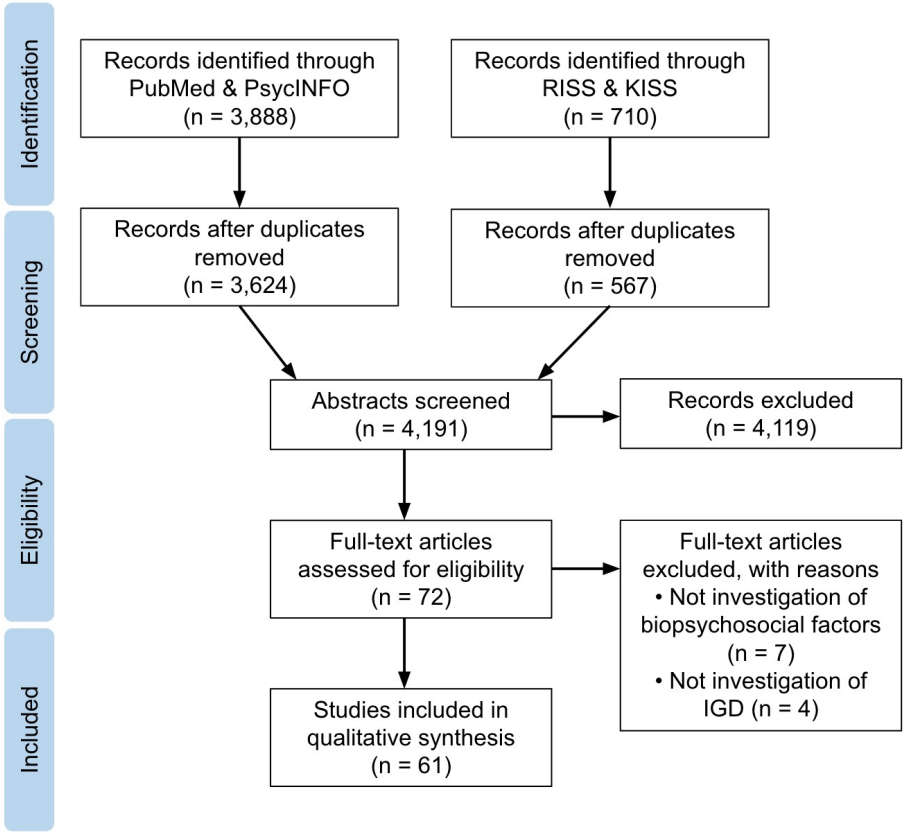
- DB: PsycINFO, PubMed // RISS, KISS

Search terms: (patholog* OR problem* OR compulsive OR overuse OR abuse OR dependen* OR disorder* OR excess* OR addict*) AND (video OR computer OR internet OR online OR offline) AND (gaming OR game)

Search terms (Korean): (게임 중독)|(게임 장애)|(게임 과몰입)|(게임 이용 장애)|(게임 과의존)

*+ peer-reviewed; English or Korean; empirical studies with primary data; full text; ~2020.10.; *used one of five scales (GAS-7, IGDS9-SF, IGDT-10, Lemmens IGD9, AICA-S)*

Provide relatively great evidential support for psychometric properties (King et al., 2020)



Results (categories identified)

Biological factors (8)

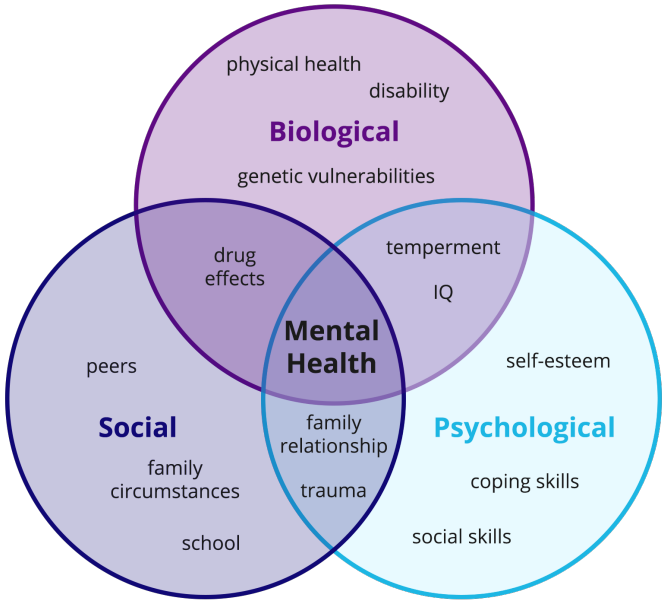
- Reward
- Self-concept
- Functional Connectivity
- Brain Structure

Social factors (22)

- Culture
- Friendship/School
- Social Support
- Family
- Social Interaction

Psychological factors (41)

- Psychiatric Symptoms
- Reward & Discounting
- Stress
- Sleep Problems
- Personality Traits
- Psychological Health
- Psychological Needs
- Impulsivity
- Self-concept
- Emotion Regulation
- Flow



(10 overlap)

Results (biological)

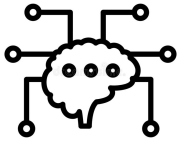
Consistent
Inconsistent
Ambiguous/NA

Reward

- Reduced reward sensitivity (fEEG) (Duven et al., 2015; Brain and Behavior)
- Stronger reward-related activation (fMRI) (Turel et al., 2020; Addiction Biology)
- Reduced dopamine transporter level (Ariatama et al., 2019; Macedonian journal)

Self-concept

- Stronger avatar identification (fMRI) (Dieter et al., 2015; Behavioral neuroscience)
- Self-concept impairments (fMRI) (Lemenager et al., 2016; Journal of Behavioral Addictions)



Functional Connectivity

- Lower FC between VLPFC & DLPFC (rs-fMRI) (Chun et al., 2020; Journal of Behavioral Addictions)
- Lower FC from the bilateral OFC to all brain regions (Kim et al., 2019; Scientific Reports)

Brain Structure

- Decreased gray matter density (sMRI) (Choi et al., 2017; Scientific Reports)

Results (psychological part 1)

Consistent
Inconsistent
Ambiguous/NA

Psychiatric Symptoms

- Comorbidity with depression, anxiety, and ADHD (Valley, 2020; Stockdale et al., 2018)
- Higher depression/anxiety/ADHD level predicting GD (Wartberg et al., 2017)

Reward & Discounting

- Overvaluing of gaming rewards (Moudiab et al., 2019)

Stress

- Higher levels of stress predicting GD (Andreetta et al., 2020; Canale et al., 2019)

Sleep Problems

- Poor sleep quality predicting GD (Severo et al., 2020)

Personality Traits

- 5 big personality traits (consensus on neuroticism and extroversion) (Wittek et al., 2016)

Results (psychological part 2)

Consistent
Inconsistent
Ambiguous/NA

Psychological Health

- Higher levels of suicidal ideation/behaviors (Musetti et al., 2019; Evren et al., 2020)
- Decreased quality of life (Phan et al., 2019)

Impulsivity

- Higher impulsitivy levels (Cerniglia et al., 2019)

Self-concept

- More dissociative experiences (De Pasquale et al., 2018)
- Hard time differentiating themselves from the avatars (Stavropoulos et al., 2020)

Emotion Regulation

- Higher levels of alexithymia (Evren et al., 2019)
- Higher levels of aggression (T'ng et al., 2020) and emotional distress (Wartberg et al., 2019

Results (social part 1)

Consistent
Inconsistent
Ambiguous/NA

Culture

- Born in Africa & Asia predicting GD (Wittek et al., 2016)
- Individualistic cultural orientation (Stavropoulos et al., 2020)

Friendship/School

- Having more than 7 friends predicting GD (Wang et al., 2014)
- Poor academic achievement (Haghbin et al., 2013)

Social Support

- Feelings of social isolation (Stockdale et al., 2018)
- Perceived social support has no effect (Scharkow et al., 2014; Wartberg et al., 2017)

Results (social part 2)

Consistent
Inconsistent
Ambiguous/NA

Family

- Higher parental anxiety/depression (Stockdale et al., 2020; Wartberg et al., 2017)
- Game-related rules/communication (Koning et al., 2018; Bonnaire et al., 2017)
- Poor attachment with parents (Teng et al., 2020)
- Most reporting gender differences

Social Interaction

- More frequent neglect of social contacts (Wartberg et al., 2017)
- Lower levels of sociability (Festl et al., 2012; Mannikko et al., 2017)
- Higher Hikkikomori symptoms (Stavropoulos et al., 2019) & FoMO score (Duman et al., 2019)
- Greater loneliness (T'ng et al., 2020)

Going back to the question…

- **Ultimate question: Shoud/Can we classify gaming disorder as a disease?**
- Sub-question: Are existing scientific evidence for listing gaming disorder as a disease adequate/valid?

- *So, what constitutes as adequate scientific evidence?*

Going back to the question…

- Current problems regarding the ‘scientific evidence’ discussion
  - (1) 40+ scales
    - Then, if we systematically control the #, can we still obtain consistent results?
  - (2) Is GD a unique phenomenon, or merely an additional factor of other problems/disorders?
    - Then, if we control potential confounding variables (sociodemographic variables, psychiatric disorders such as depression/anxiety/ADHD, etc.), can we still obtain consistent/significant results?
    - Then, if we look at predictive values of GD rather than mere correlation/group differences, can we still obtain consistent/significant results?

#1. consistent results? NOT REALLY.

Reward-related activity

- Reduced reward sensitivity vs. hypersensitivity to reward (brain data & self-report)

Self-concept

- Equating oneself with the avatar vs. dissociation btwn avatar and self (brain data & self-report)

Social relations

- Neglect of social contacts vs. Higher number of friends (self-report)

Family relationship

- Contrasting results regarding gender effects (self-report)

Personality traits

- Contrasting results regarding agreeableness, openness, and conscientiousness

Culture

- Birthplaces (Asia & Africa) vs. individualistic culture

#2. Unique phenomenon? CAN'T TELL YET.

Studies controlled for basic sociodemographic variables (e.g., age, gender)

- 33/61

Studies controlled for psychiatric symptoms/diagnosis (e.g., depression, anxiety, ADHD)

- 5/61

Longitudinal studies (where we can really get information regarding GD's risk factors/consequences)

- 5/61

Implications/Conclusion

Answer to the question: Are existing scientific evidence for listing gaming disorder as a disease adequate/valid? --> **NO. (at least not now)**

Future directions (what we need to truly unravel the mystery)

- Consensus on the diagnostic criteria
- Longitudinal & high-quality clinical trial studies

Thanks!