Connection, meaning, and distraction: A qualitative study of video game play and mental health recovery in veterans treated for mental and/or behavioral health problems

Michelle Colder Carras, Ph.D[a],* [surname: Colder Carras], Anna Kalbarczyk, M.P.H.[b], Kurrie Wells, Ph.D.[c], Jaime Banks, Ph.D.[d], Rachel Kowert, Ph.D.[e], Colleen Gillespie, B.S.N.[f], Carl Latkin, Ph.D.[g]

[a] Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, 624 N. Broadway St., Baltimore MD 21205. Email: mcarras@jhu.edu

[b] Department of International Health, Johns Hopkins Bloomberg School of Public Health, Baltimore MD USA 21205. Email: akalbarc@jhu.edu

[a,c,f] A Department of Veterans Affairs Medical Center within the 'VA Healthcare' Veterans Integrated Service Network 4, USA [Note: Specific location withheld to protect participants' privacy] Emails: Kurrie.Wells@va.gov; Colleen.Koonce@va.gov
[d] Department of Communication Studies, West Virginia University, Armstrong Hall, 94 Beechurst Ave #108, Morgantown, WV USA 26505 Email: jabanks@mail.wvu.edu

[e] Kitsune Analytics, Ottawa, Ontario, Canada. Email: RKowert@gmail.com

[g] Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, 624 N. Broadway St., Baltimore MD USA 21205 Email: Carl.Latkin@jhu.edu

*Corresponding author : Michelle Colder Carras, Ph.D, Behavioural Science Institute, Radboud University, A.06.34, Montessorilaan 3, 6525 HR Nijmegen, Netherlands
Tel. +31-(0)24-3612816 Email: M.Carras@pwo.ru.nl [no fax number]

Highlights

- We spoke with veterans in mental health treatment about their video game play.
- Many veterans used games to connect to others, but some felt play was isolating.
- Video game play also supported adaptive coping and eudaimonic well-being.
- Several veterans described feeling addicted to games presently or in the past.
- For some veterans, video games may be "personal medicine" that promotes recovery.

Abstract

Rationale: Mental and behavioral health recovery includes concepts related not just to symptom improvement, but also to participating in activities that contribute to wellness and a meaningful life. Video game play can relieve stress and provide a way to connect, which may be especially important for military veterans.

Objective: We explored how military veterans used video game play to further their mental and behavioral health recovery by conducting an exploratory thematic analysis of the gaming habits of 20 United States military veterans who were in treatment for mental or behavioral health problems.

Methods: We conducted semi-structured interviews in 2016 and used a framework analytic approach to determine salient themes linking video gaming to mental and behavioral health recovery.

Results: Veteran participants reported that video games helped not only with managing moods and stress, but also with three areas related to other aspects of recovery: adaptive coping (e.g. distraction, control, symptom substitution); eudaimonic well-being (confidence, insight, role functioning) and socializing (participation, support, brotherhood). Meaning derived from game narratives and characters, exciting or calming gameplay, and opportunities to connect, talk, and lead others were credited as benefits of gaming. Responses often related closely to military or veteran experiences. At times, excessive use of games led to life problems or feeling addicted, but some veterans with disabilities felt the advantages of extreme play outweighed these problems.

Conclusion: Video games seem to provide some veterans with a potent form of "personal medicine" that can promote recovery. Although reasons and results of gaming may vary within and among individuals, clinicians may wish to discuss video game play with their patients to help patients optimize their use of games to support recovery.

Keywords: Video Games; Mental Health Recovery; Social Support; Veterans; Substance Use Disorders; Self-Management; Suicide; United States

1. Introduction

Despite efforts to transform mental health care for United States (US) veterans and service members, many veterans continue to suffer from mental health problems such as post-traumatic stress disorder (PTSD), depression and anxiety (Castro, 2014). Individuals may enter service with a pre-existing mental condition (Kessler et al., 2014), and combat and deployment away from family are associated with stress and depression (Hoge et al., 2006). Substance abuse disorders are common among veterans with PTSD or depression (Department of Veterans Affairs, Department of Defense, 2015) and suicide is a pressing problem, with continuing high rates of suicide and suicidal ideation (Ashrafioun et al., 2016). Concerns about confidentiality as well as attitudinal and cultural barriers to treatment are significant challenges, and health promotion and resilience programs remain a persistent need (Hoge et al., 2015; Tanielian et al., 2008). Trauma-focused psychotherapy is the primary recommendation for treatment of veterans with PTSD (Department of Veterans Affairs, Department of Defense, 2017). Therapies such as prolonged exposure (Foa et al., 1991), cognitive processing therapy (Resick et al., 2002), and narrative exposure therapy (Ertl et al., 2011) aim to help veterans process trauma and may involve cognitive, emotional or behavioral components, but always involve exposure to the traumatic experience. However, for many veterans with PTSD these therapies are not available or tolerated (Department of Veterans Affairs, Department of Defense, 2017). Veterans may have

difficulty accessing mental health care, may fail to seek treatment due to stigma, or may leave treatment early, particularly for the most effective (yet uncomfortable) exposure-based therapies (Yoder, 2016). A wider range of mental health treatment options are needed to address the needs and barriers among veterans (Hoge, 2016). Electronically-delivered therapies may be a useful complement. The VA supports telepsychiatry visits (e.g., videoconferencing with a case manager in collaborative care models for depression or with a therapist for trauma-focused treatment for PTSD) as well as internet-delivered cognitive behavioral therapy (iCBT) for PTSD (Department of Veterans Affairs, Department of Defense, 2017, 2016). Emerging treatments take advantage of virtual reality to treat PTSD, with results showing mild-to-moderate improvement of symptoms comparable to exposure therapy and reduction of brain hyperarousal to PTSD triggers (Rothbaum et al., 2001; Roy et al., 2010).

Although goals of recovery and suicide prevention may differ slightly, both include concepts of hedonic (happiness and lack of psychological distress) and eudaimonic (returning confidence, autonomy, hope, meaning and functioning in life) well-being (Bush et al., 2015; National Academies of Sciences, 2016). Clinical best practices to promote these aspects of recovery and wellness include working with patients to identify appropriate and effective strategies—the "personal medicine" that empowers them to live the life of their choosing (Deegan, 2005; MacDonald-Wilson et al., 2013). While some strategies focus primarily on coping with symptoms, others focus on goals such as identifying and pursuing valued activities, social and community participation, recognizing strengths, and proactively managing psychological and cognitive resources (Coulombe et al., 2016; Deegan, 2005; Villaggi et al., 2015). VA clinical practice guidelines strongly support shared decision making to support veterans' recovery from behavioral health conditions (Department of Veterans Affairs, Department of Defense, 2017, 2016, 2015), and emerging practices within the VA and the private sector include online and mobile-based mindfulness interventions, PTSD coaching, therapy support, and social connection (Bush et al., 2015; Department of Veterans Affairs, Veterans Health Administration, 2017; Objective Zero Foundation, 2018; Spijkerman et al., 2016). However, interventions designed to improve health often show less effectiveness in the real world due to attrition, which has led to an interest in using digital games to support mental health (Baranowski et al., 2015). This study takes a first step toward understanding how commercial video games may be used for mental health support by exploring their potential therapeutic benefits.

1.1 Well-being benefits of recreational video game play

Because they afford opportunities for engagement and interaction, video games, particularly games involving social interaction, may be a productive way for their users to actively seek—and find— relief from symptoms of psychological stress and mental disorders and offer opportunities for users to pursue goals related to mental health recovery, wellness and suicide prevention (Bowman and Tamborini, 2012).

As a form of recreation, video games provide individuals with the opportunity to recover from stress and manage moods (hedonic benefits) but may also promote eudaimonic aspects of recovery and good mental health (Bowman and Tamborini, 2012; Reinecke and Eden, 2017; Rigby and Ryan, 2017). Aside from the fun, the challenge, the pleasurable cognitive state known as "flow" (Csikszentmihalyi, 1990), and the brief distraction from the stresses of daily life they offer as a form of recreation/entertainment, video games allow players to build cooperative relationships, engage in moral decision-making, set and achieve goals, and help others (Kowert,

2016; Oliver et al., 2015), opportunities that correspond closely to dimensions of mental health. Media use and mindfulness practices both allow decentering—psychological distancing from symptoms and stressors—which permits relief from negative moods and lifts some of the cognitive bias associated with those moods (Garland et al., 2015; Reinecke and Eden, 2017). This subsequently enables a broadening of attention, which enables people to reframe perspectives and draw new meaning from difficult experiences (Garland et al., 2015). Games allow players to engage in social interactions that may enhance social and psychological well-being—they offer unique features that make them an ideal place for friendship formation and stress-buffering social support (Kowert, 2014; Steinkuehler and Williams, 2006). Even relationships with game avatars—the digital bodies controlled during play—can be useful as players use avatars to experiment with identity or work through life challenges (Banks, 2015).

1.2 Clinical evidence for therapeutic effects of video game play
Video games have been shown to reduce symptoms of PTSD (Holmes et al., 2010; Iyadurai et al., 2017) and depression (Russoniello et al., 2013) in clinical samples, and are incorporated into at least one electronic intervention for suicide prevention as a method of self-distraction (Bush et al., 2015). Young veterans with PTSD, depression or substance use disorder spend more time playing video games than those without a diagnosis (Grant et al., 2018), and a small qualitative study (n=6) found that veteran gamers diagnosed with PTSD found playing first person shooter games (FPS) helpful in navigating difficult aspects of symptoms and the challenges of reintegration (Elliott et al., 2015). In that study, most veterans reported that FPS were beneficial forms of distraction and helped them feel connected to others, yet also reported that at times games triggered traumatic memories. One veteran addressed the potential for FPS as exposure therapy, describing how triggering of physical symptoms of PTSD by the game allowed him to "own" and deal with these symptoms in an effective way (Elliott et al., 2015 p. 274). A recent survey study of military and veteran gamers shows that about half use games to deal with military-related stress, and those with psychological and physical limitations may seek a renewed sense of self-efficacy through gaming as a form of adaptive coping (Banks and Cole, 2016). However, relying on heavy use of video games to cope with stress may be a maladaptive coping strategy and lead to problematic outcomes (Kardefelt Winther, 2014; Snodgrass et al., 2014).
Recent proposals for disorders related to excessive gaming (e.g., Internet gaming disorder, American Psychiatric Association, 2013) suggest that gamers who fulfill several criteria (e.g., loss of control over gaming, continuing to game despite negative consequences, use of games to escape a negative mood and jeopardizing or losing significant relationship, career, educational or job opportunity) along with significant impairment or distress may have a mental disorder in need of treatment. Decades of video game research have focused on similarities between problematic gaming and addictions, often with significant debate about what separates excessive but non-pathological gaming from disordered gaming (Aarseth et al., 2017; Griffiths et al., 2016; van Rooij et al., 2018). Consistent with a focus on the importance of social and role functioning in psychological well-being, gamers themselves believe that interference with life areas, including avoidance of social interactions, is a primary indicator of gaming-related problems (Colder Carras et al., 2018a). Among military gamers, problematic play is not associated with loneliness or coping when pursuing positive feelings and avoiding boredom are controlled for (Myrseth et al., 2017). Clearly, commercial video games show the potential to help veterans, but it is also necessary to investigate factors that might create additional problems.

The objective of the current investigation is to broaden the scant research on the use of commercial video games for mental health and suicide prevention by examining the beneficial and problematic uses of video games in a population of veterans being treated for mental or behavioral health conditions.

2. Methods

Toward a better understanding of veterans' use of videogames, we conducted an exploratory thematic analysis of both productive and problematic dimensions of this population's gaming habits. Specifically, we conducted semi-structured interviews to gather perceptions and experiences about gameplay, military experiences, and mental health in a clinical population of veterans, then analyzed interviews using thematic analysis (Gale et al., 2013). The interview guide (See Supplement 1: Semi-structured interview guide) was developed with the input of all authors, three of whom have extensive qualitative research training and experience, as well as an advisory panel of seven veterans, most of whom played video games.

2.1 Sample recruitment

After the study protocol was approved by the appropriate institutional review board, participants were drawn from the population of English-speaking veterans in participating mental and behavioral health inpatient units and outpatient clinics at a Veterans Affairs (VA) Medical Center in the US. Participants were recruited through flyers posted in the participating mental and behavioral health clinics or given to patients by clinicians. The interviewer and analysts had no prior relationship with participants. To enhance credibility, our sampling strategy and materials targeted habitual gamers (i.e., those who played video games for seven or more hours per week, an amount considered average for US adults, Entertainment Software Association, 2015) and who were in treatment for mental and/or behavioral health problems. All participants provided written informed consent.

2.2 Data collection

Interviews were conducted by author MCC, who was at the time a female postdoctoral researcher in public mental health and who has extensive personal and research experience with both video game play and mental health recovery. Audio-recorded interviews took place between April and October of 2016 in a private room within an outpatient psychiatric clinic and each lasted approximately one hour. The primary goals of the study, which were described to participants during the informed consent process, were to explore the benefits to mental health and problems associated with video game play among veterans treated for mental and/or behavioral health problems. If questions arose about the interviewer's own views or personal experience with video gaming or mental health problems, the interviewer answered them after the interview; the interviewer did not attempt to hide her general knowledge of video games or of mental health recovery. Member checking occurred during the interviews by restating and summarizing information and then checking with the participant to gauge accuracy of understanding.

Emergent themes were discussed between authors JB and MCC as interviews progressed, and data collection continued until data saturation was achieved, i.e., no new themes were identified. Sample size was determined based on this data saturation. Recorded interviews were transcribed verbatim by a professional service and by MCC, and field notes were typed after each interview.

2.3 Data analysis

After transcription, all authors read several transcripts and discussed important themes. Authors MCC and AK then iteratively coded and discussed several interviews to ensure appropriate coverage for a working analytic framework, using Microsoft Excel to record codes, themes and example quotes. To enhance credibility of data analysis in accordance with a thematic analysis strategy, the working analysis categories and themes were progressively refined within the sensitizing framework (Bowen, 2006) of interview questions, insights from both mental health and game studies literature, and input of veteran advisors and clinician authors (see Supplement #2: Framework analytic matrix). AK and MCC then analyzed the remaining transcripts separately using the analytic matrix, charting relevant codes and quotes into the matrix to illustrate themes for each participant. The matrices were analyzed to compare, contrast and interpret data within and between participants, with special attention to querying theoretical concepts from recovery and game studies and exploring relationships between themes. Thematic analysis results were shared with veteran advisors during analysis by email and in person where possible for feedback and interpretation for additional credibility. The manuscript was drafted in accordance with established criteria for reporting qualitative studies (O'Brien et al., 2014) and was shared with veteran advisors through email. Advisors did not recommend modifications. Themes and narrative extracts are described below with contextual information about demographics, self-reported diagnoses, preferred games and time spent gaming to enhance transferability.

3. Results

3.1 Study participants' demographics, clinical and video gaming contexts

Our final sample included fifteen males and five females ranging in age from 25 to 62 (Table 1). One participant completed only half of the interview due to somnolence from traumatic brain injury; his partial interview was included. All branches of the armed services were represented, and individuals varied in their occupations, relationship status, and domicile. Although we did not ask about inpatient status, two women and three men indicated that they were current participants of the facility's mental or behavioral health inpatient or residential programs. Sixteen out of 20 individuals reported they had PTSD or trauma-related symptoms. Most individuals reported more than one current mental or behavioral health diagnosis, with PTSD and depression being the most common combination. Three individuals had more than one type of trauma, such as combat- or training-related trauma, military sexual trauma (trauma from sexual assault or harassment during military service) and/or childhood sexual abuse.

Table 1. Demographic and mental health characteristics of participants.

ID	Sex	Age	Branch of service	Race/Ethnicity	Diagnoses
1	Male	46	Army	Black	PTSD, Dep
2[a]	Male	41	Army	Black	OCD, PTSD, SUD

ID	Sex	Age	Branch of service	Race/Ethnicity	Diagnoses
3	Female	55	AF	Black	PTSD, Dep, MST
4 [a]	Female	53	Army	White	PTSD, Dep, SUD, MST
5 [a]	Female	62	Army	White	Bipolar 1
6	Male	33	Marines	White	PTSD
7	Male	54	Army	White	PTSD
8	Male	49	AF	White	PTSD, Dep
9	Male	32	Army	White	PTSD, ADHD
10	Male	34	AF	White	PTSD, MST, Dep, Panic Disorder, SUD
11 [a]	Female	52	AF	White	Dep, PTSD, Anxiety
12	Male	57	AF	Black+A. Indian	PTSD, Dep
13	Male	52	Army	Black	PTSD, Dep, SUD
14	Male	25	AF	White+H/L	Sleep problems
15 [b]	Male	Unk	Unk	Black	TBI
16 [a]	Male	25	Army	White	SUD, PTSD, Dep
17	Male	34	Army	Black	PTSD, TBI, Dep
18 [a]	Male	30	Navy	Black	Bipolar 1
19	Male	49	Marines	White	Bipolar 1
20	Female	48	AF	White	PTSD, Dep

Note. All table information is self-reported. Multiple race/ethnicity categories indicated with +. A. Indian=American Indian; ADHD=Attention Deficit Hyperactivity Disorder; AF=Air Force; Dep=Depression; H/L=Hispanic/Latino; MST=Military sexual trauma; PTSD=Posttraumatic Stress Disorder; SUD=Substance use disorder/alcohol use disorder; TBI=Traumatic brain injury; Unk=Unknown

[a] Participant reported being in short-term or long-term residence/inpatient at the facility.
[b] Participant became somnolent and interview was terminated early; some data is unknown.

Preferred games, play styles, and gaming habits varied between those who mostly played mobile games and others (Table 2). Mobile phone games were usually played sporadically

throughout the day. Women usually played mobile games alone while men usually played mobile games with a wife or girlfriend. Current hospitalization or other circumstances (e.g. school, others using the computer) sometimes limited gaming time.

Table 2. Gameplay habits of sample

ID	Preferred games	Usual frequency/ duration of play	Preferred play style
Men			
1	Madden, *Quizlet*	2 hours most days	In-person multiplayer
2	Madden, Mario Kart, *Scatter Slots*	Occasionally for 6-7 hours	Solo
6	Dragon Age Origins, Doom, The Division	At least an hour a day	Solo
7	Ark Age, State of Decay, Life is Strange	Estimated every day 3+ hours/day	Multiplayer online
8	WoW, Call of Duty, The Sims	1-2 hours/day	Multiplayer online
9	Battlefield Hardline, Witcher 3, Batman Arkham Knight	6-7 hours/day	Multiplayer online
10	Gears of War, WWE, PGA Tour Golf	3-4 hours/day	Multiplayer online
12	Call of Duty, Star Trek Online, Microsoft Flight Simulator	Generally 2-3 hours/day, longer on weekends	Multiplayer online
13	*Monster Busters,* Madden, NBA Live, Major League Baseball	Every day, a little bit during free time	Solo
14	Witcher 3, Overwatch, Battlefield 4	When in school, less than 2 hours/day	Multiplayer online

ID	Preferred games	Usual frequency/ duration of play	Preferred play style
15	Fritz, Suzuki, Dominoes	3-5 hours/day	Solo
16	Madden, Call of Duty	2 hours/day with occasional binges/periods of not playing	Solo
17	*Neopets*, Dead Island, Grand Theft Auto	All day every day	Solo
18	Heroes of Newerth, Tekken, Street Fighter	All day	Multiplayer online
19	*Candy Crush*, Forza, Fallout 4	2 hours day, 3-4 days/week	Solo or 2P mobile
Women			
3	*Flow Free, Blossom Blast, Meegos*	Every day, sporadically as much as time allows (mobile)	Solo
4	Donkey Kong, Super Mario Brothers, Wii Sports	Limit to an hour/day	Solo
5	*Bejeweled, Bingo, Tetris*	Every day, sporadically as much as time allows (mobile)	Co-play
11	*Candy Crush, Angry Birds, Criminal Case*	Sporadically during the day, 1-2 hours at a time (mobile)	Solo
20	*Candy Crush, Solitaire, Hit it Rich*	Sporadically, 2 hours/day (mobile)	Solo

Note. Italics indicates games played on a mobile device/cell phone. Answers taken verbatim where possible for frequency/duration of play. "Estimated" answer inferred from game types and

description of gameplay experiences/accomplishments. Co-play: playing side-by-side but not multiplayer. Mobile: Participant played mostly mobile phone games

Thematic analysis produced major themes in the areas of mental and behavioral health problems, military identity and experiences, and gaming experiences as well as links between gaming, mental, and behavioral health (see Table 3). Video game experiences that linked closely with eudaimonic aspects of recovery centered on the use of games for promoting confidence and connecting socially. Most participants also discussed the positive effects of games on mood.

3.2 Adaptive coping: Distraction, control, and substitution

Many individuals discussed the importance of video game play as a way to manage mental health symptoms actively through distraction or by substituting video gaming for potentially harmful behaviors. For example, nine out of the sixteen individuals who reported a diagnosis of PTSD said they used it to "distract" or "take [my] mind off" symptoms such as intrusive thoughts related to PTSD or depressive rumination (including suicidal thoughts or impulses). One participant said,

> *"Go to your happy place and, and get your mind off of it. I try not to give any negative thoughts any momentum…there was times I was suicidal…*
> *I tell guys in recovery and with depression, you know, you just can't just go to meetings, you just can't take medication; you gotta find something to fill those spaces in when you got the time to think of–you know, the devil's workshop... you gotta do something to get outside yourself." Male, 46, ID#1*

Some individuals found games accessible when other coping strategies were not or used games as an additional tool when medication was not effective at controlling symptoms. In this case, games were sometimes described as being simultaneously "mindless" and "focused" or "grounding." The quotes below illustrate how this decentering was useful for symptoms of OCD and depressive/anxious rumination:

> *Something that makes you think, and with my mind racing a million miles a minute those kind of settle me down and I'm not thinking about nonsense... I get tunnel vision and I'm focused on what I'm doing. Male, 41, ID#2*

> *It helps with refocusing because yes, they give you tools to do these, but when you're in the midst of all that chaos, you're not thinking about tools… Turn it on, and you can refocus. You're not thinking, but your brain has the time to stop quivering. Female, 55, ID#3*

Several participants talked about using games to replace risky behaviors, including drug use/relapse, alcohol abuse, and aggressive or criminal behavior. Some participants described how their intense involvement with games in childhood saved them from "a life on the streets". Others spoke to how games helped them remove themselves from interpersonal situations that they felt would lead to "outbursts". One young male veteran who was currently hospitalized for heroin addiction pointed to the utility of games as a "sober activity." Another participant described the purposeful use of games as part of daily structure to prevent relapse:

> *"It's like sometimes when I can't take it anymore and it seems like it pings in my head that I'm going to drink, I'm going to drink, I'm plotting… It's hard to stop that thought when that lights up in my brain…I want to structure [gaming] into my day because again, too much time on my hands leads to more chances for the bad memories and the "what's the use" feelings to come in so I've actually made out a daily schedule of like, at this hour I'm going to meditate for 15 minutes. I'm going to do this exercise DVD and I'm going to have my gaming time today." Female, 53, ID#4*

3.3 Eudaimonia: Confidence, insight, and role functioning

For many individuals, the ability to succeed in games gave them a sense of confidence that they felt they could use in real life. By progressing to the next level, solving a particular puzzle or defeating a boss or opposing team, participants described positive feelings that were often in stark contrast to their situational stressors or psychological challenges. For some, this extended beyond the fun and enjoyment associated with escapist or mood improving aspects of games and into a belief in their own competence to achieve goals, which they felt made it easier to face difficult aspects of recovery. One participant who described the importance of being able to collect diamonds every day in her game also described a similar recovery goal: collecting her one-year sober coin in Alcoholics Anonymous. She reflected on how feelings of competence in the game translated to real-life mental strength and persistence:

> *"That's what I love about it. Challenges and stuff like that. Because it brings me back to the fact that there's challenges in life that I gotta face… It helps me recognize those and go for it. Don't be shy, don't be afraid. Take a step, you know? Face it." Female, 62, ID#5*

Some participants felt that the intensity and realism of stories about war gave them insight into their own experiences. Others described how battlefield simulations or first-person shooters allowed them to draw on their strengths in understanding military strategy and return to the setting that may have invoked feelings of exhilaration, pain, and trauma. For some, the enticement of being able to make and revise moral decisions (even outside of military-style games) was a big draw:

> *"Things make sense again...You know, good, evil…Evil is evil; you stomp it out, we're good." Male, 33, ID#6*

> *"She can control time… And it's up to you, the player, how far back you go...you hit a button... And you stop at the point you want and then you get to change your mind. Like if you made a decision and your friend got killed, you get to pull it back, make a different decision and see if they die or not." Male, 54, ID#7*

Being able to help others was a source of satisfaction for some, who linked this value to their military experience and devotion to service. Others described significant leadership roles within games. One participant was a former leader of a professional video game organization, while others discussed how their game characters or resources contributed to valued, in-game leadership roles, including one participant who managed to build a profitable business within a virtual world. He said,

"My club was the number one ranked club in [the game]… So many people would come, the server apparently couldn't handle all of that and it would actually crash. I sold a portion of it… for $5,000 because it was so popular." Male, 49, ID#8

In other cases, gamers used web streaming services to turn their passion into a career. One young veteran who received full disability as a result of his severe PTSD describes how his passion for gaming led to paid employment as a streamer (a gamer who broadcasts his gameplay through live video):

"I game probably about eight hours a day and I broadcast on a website…. That's my hobby. It's something I've been doing for a while and I finally got into it professionally…I actually work for [them] now." Male, 32, ID#9

Some participants felt that their in-game experiences helped them solve relationship problems or strengthen their abilities as leaders. One former Marine who talked about his problems dealing with aggression described how he was able to use tactics from the game to reduce his own angry responses in a difficult in-person relationship:

[I was]dealing with the possibility that my dad may be a problem drinker, an alcoholic… I was going to...take my fighting knife from when I was overseas and just make him sit there and watch as I stabbed every can of beer he had… Instead, I'm like, no, because this [game monster] is big and slow and I can outmaneuver him...So, instead of taking the direct route of dealing with my father's issues...I put him in a position where he was relaxed. He didn't need to [get defensive]. Male, 33, ID#6

3.4 Socializing: Participation, support and brotherhood

Participants ranged broadly in their descriptions of gaming and resulting social interactions. Three out of the five women in the sample described using games to isolate themselves at times, while another woman said that playing games with others on the inpatient floor kept her from isolating. Two men discussed using gaming to connect with thousands of viewers in real time through a game streaming service. Many men found side-by-side play the most satisfying for its ability to foster face-to-face social support within existing family and friend groups. Although "trash-talking" was a vital part of the experience for many of the male players, just relaxing and playing a sports video game side-by-side was seen as an opportune time for casual or even meaningful discussion. One participant said,

"The most important thing to me now is just maintaining a good relationship with my family. And we do it through video games… because even though we're playing, you've got a nephew who's graduating high school, he's thinking about going to [college], we're just talking about it while we're playing." Male, 46, ID#1

Others preferred the ease of socializing with casual online acquaintances through games and emphasized the ability to connect to others worldwide who shared their interests or experience, such as through an in-person meeting of "guild" members from nine different countries. For some men, this paralleled their value for the "brotherhood" experienced during

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military service and their subsequent comfort in relationships with fellow veterans who understood their experiences. Unlike in real life, where some individuals felt that their veteran status meant that potential employers saw them as "crazy and PTSD-ridden," for some, their military status provided them with benefits within games, such as the ability to band together once again:

> *"I've met a bunch of active duty infantry guys and we play specific combat games together. We all know the lingo and it's awesome. We kick some serious ass out there." Male, 32, ID#9*

3.5 Managing moods and relieving stress

Most individuals also described using games to cope with stress, manage moods, or just release tension as well. This went both ways—for example, one young veteran felt gaming gave him a refreshing break, saying:

> *"The other day when I was playing that game with the guy, I just felt refreshed… like when you watch a movie and the movie's over and then you're like ah, I can breathe." Male, 25, ID#16*

Others praised "high action" games for helping them to fight boredom or for being stimulating or activating. One veteran with physical and psychiatric disabilities described how these aspects of games helped bring him out of the slow pace of life:

> *"I can't stand solitude, things being slow. I need flashes of light and noise, and 30 billion things going on at once…[With games], sometimes you get so into it you forget to breathe." Male, 34, ID#10*

One concept voiced by several veterans was the interaction between military training and experiences and the ability of games to provide a release for aggressive feelings. Some described training and military service as turning them into "adrenaline junkies" who still longed for competition and excitement. The "warrior instinct" developed through military training was still strong for some participants, who felt that realistic shooting games were particularly helpful. One former Marine reflected on the experience of being on the front lines of battle:

> *"The shooters do have their advantages because, you know, when – there's the old saying by Hemingway about the hunting of man… It'll allow you to vent some pent-up aggression… I find it works very well for guys who've been in or around the infantry." Male, 33, ID#6*

3.6 Problems related to game play

Several people felt that their focus on gaming was obsessive, and that it had caused life problems in areas such as relationships, finances or job seeking. Although some joked about these problems or thought they were minor ("*[the wife says] I hope that video game keeps you warm!*" ID#1), others spoke to serious strains on relationships, time management, or finances.

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Seven individuals described feeling addicted, and another four individuals described having been addicted at some point in the past. Although many individuals talked about the importance of social aspects of gaming, some veterans described their gaming as "isolating" and linked solo gaming to mental or behavioral health symptoms such as depression or substance use:

> *"When I'm depressed I do play a lot of video games. I isolate myself and that's something I can do that keeps me occupied by myself...I might be playing video games for two hours one day, well I'm sober for those two hours." Male, 25, ID#16*

However, other individuals felt that describing games as addictive when other media were not was a false dichotomy.

> *"I love playing video games. It's what I love to do. I love to read too. Am I addicted to reading?" Male, 30, ID#18*

4. Discussion

   We spoke with 20 veterans who played video games regularly and were treated for mental and/or behavioral health problems and found evidence linking game play to important factors in mental health recovery and positive well-being. Participants described using games to distract from overwhelming symptoms, including suicidal thoughts and drug or alcohol use, and many found social benefits, inspiration, and insight through game play. Most found games not only fun and uplifting, but also an important tool for improving and maintaining other aspects of recovery and positive mental health. However, some veterans felt they played games excessively or were addicted, and reported that gaming affected relationships, finances or time management. Thematic analysis clarified how our sample's use of video games corresponds to known areas of mental health recovery and suicide prevention (Bryan, 2016; Bush et al., 2015; Deegan, 2005; Garland et al., 2015; MacDonald-Wilson et al., 2013; National Academies of Sciences, 2016; Shand et al., 2015; Simon et al., 2016; Struszczyk et al., 2017; Villaggi et al., 2015; Whitley and Drake, 2010), as illustrated in Table 3.

Table 3. Recovery strategies, video game play examples and relevant quotes.

Selected area of recovery/suicide prevention	Example from video game play	Illustrative quote
Adaptive coping		
Distraction	From rumination or suicidal thoughts	*"...there was times I was suicidal… you gotta find something to fill those spaces in when you got the time to think of–you know, the devil's workshop..."*
Focus	When symptoms or medication interfere with thinking	*"It helps with refocusing because yes, they give you tools to do these, but when you're in the midst of all that chaos, you're not thinking about tools…"*
Preventing relapse	Substituting for alcohol or heroin use	*"I might be playing video games for two hours one day, well I'm sober for those two hours."*
Eudaimonia/well-being		
Autonomy/confidence	Sense of accomplishment	*"That's what I love about it. Challenges and stuff like that. Because it brings me back to the fact that there's challenges in life that I gotta face… It helps me recognize those and go for it."*
Meaning/insight	Good vs evil	*"Things make sense again...You know, good, evil...Evil is evil; you stomp it out, we're good."*

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Selected area of recovery/suicide prevention	Example from video game play	Illustrative quote
Social relationships		
Social support	Playing and talking with family members in person	*"The most important thing to me now is just maintaining a good relationship with my family. And we do it through video games…"*
Connecting	Meeting other military members online	*"I've met a bunch of active duty infantry guys and we play specific combat games together. We all know the lingo and it's awesome."*
Role functioning		
Leadership	Leading a team or guild	*"My club was the number one ranked club in [the game]…I sold a portion of it… for $5,000 because it was so popular."*
Meaningful work	Being a professional gamer or streamer	*"I broadcast on a website... That's my hobby…and I finally got into it professionally…I actually work for [them] now."*
Managing feelings/mood		

Selected area of recovery/suicide prevention	Example from video game play	Illustrative quote
Stress relief	Enjoying a refreshing break	*"The other day when I was playing that game with the guy, I just felt refreshed… like when you watch a movie and the movie's over and then you're like ah, I can breathe."*
Relieving boredom	"Getting into" a game	*"I can't stand solitude, things being slow. I need flashes of light and noise, and 30 billion things going on at once…[With games], sometimes you get so into it you forget to breathe."*

Most of our sample used video games to cope with or distract from symptoms. Being able to cope effectively with distressing emotions or to plan meaningful activities that replace potentially dangerous unstructured time is important for individuals in recovery from mental health problems or substance addiction (Luciano et al., 2014; Villaggi et al., 2015). Feeling confident in one's coping ability is an important element of well-being, and feeling that one can cope with suicidal thoughts helps to avert suicidal crises (National Academies of Sciences, 2016; Stanley et al., 2017). However, relying on games or other methods of distraction to cope outside of suicidal crises may not be effective or may impede progress in cognitive behavioral treatments, e.g., for PTSD (Stanley et al., 2017). In its recommendation for psychotherapy as part a collaborative care approach for depression, the VA notes that structured treatments such behavioral activation improve depression outcomes (Department of Veterans Affairs, Department of Defense, 2016). One potential research area for integrating gaming into therapy is with Behavioral Activation (BA) therapy. In this approach, patients are encouraged to monitor their activities and related moods in order to develop an awareness of reinforcing activities as well as avoidance patterns that interfere with long-term goals. As we found that gaming served multiple beneficial functions but also was felt at times to interfere with relationships or other activities, examining gaming in the setting of BA therapy may be useful for teasing out its benefits and drawbacks. It will be important in such research to try to determine whether and how veteran gamers can use gaming as a bridge between intolerable symptoms and adequate coping without adding to difficulties engaging in real-world activities.

For our sample, the narratives and interactivity of games provided both direct (re-experiencing combat) and indirect ("rewinding" decisions) ways to work through combat- or other military-related issues and develop insight into the self. In addition, evaluating important risk factors for suicide such as guilt and shame may improve clinicians' assessment of suicide risk (Bryan et al., 2013). Clinicians can explore feelings of guilt and shame with patients who play games that have a strong narrative or that simulate combat situations. Likewise, clinicians can explore how patients use games to socialize, team up, distract themselves, or improve their sense of control (Bean, 2018). Clinicians should discuss the potential risks and benefits of using games for coping or distraction to ensure that gaming does not interfere with recovery.

Another clear area of clinical potential is the use of commercial games for virtual reality exposure therapy. As retention in exposure-based talk therapies for PTSD is low (Hoge et al., 2014), formally assessing the potential benefits of commercial video game play as a virtual reality exposure is warranted. The development of consumer virtual reality headsets has lead to a renewal of interest in virtual reality treatments based on simulated combat exposure (e.g., BraveMind, Rizzo et al, 2017). Our study adds to prior qualitative research (Elliott et al., 2015), and suggests that commercial video games may be an easily-accessible and engaging mode of delivering exposure interventions, whether through a virtual reality headset or a traditional console or computer platform.

The benefits of gaming and of connecting sometimes went beyond social and psychological and into functional, as players became leaders within guilds or teams or pursued goals of becoming professional gamers or Internet streamers. For individuals with disabilities, leadership positions in the real world might be difficult to find or to maintain. As gaming-related professions such as Internet streaming or professional e-sports become more common, these may provide avenues for productive and rewarding roles for veterans with disabilities.

Men in our sample valued the social connections obtained through multiplayer games. Military training encourages service members to rely on one other, yet also requires strength and

self-sufficiency, which interferes with seeking support and treatment if psychological problems develop (Bryan and Morrow, 2011; Tanielian et al., 2008). Actions taken during combat or even training (such as killing or witnessing atrocities or maimed fellow soldiers) often clash with an individual's sense of right and wrong, and the resulting "moral injury" is thought to lead to depression, greater PTSD, and suicidal ideation (Litz et al., 2009). Because of this, traditional psychotherapies and interventions for help-seeking that emphasize problems and abnormality may clash with both the experiences of training and war and the mindset that promoted strength and resiliency during military service (Bryan and Morrow, 2011). Men who are suicidal place high value on social support, and just being able to talk to someone may prevent suicidal acts during times of imminent risk (Player et al., 2015; Shand et al., 2015; Struszczyk et al., 2017). The casual environments associated with playing games side by side may make it easier to talk about serious subjects and the anonymity of online gaming environments can foster confiding, especially among individuals with psychological challenges (Frostling-Henningsson, 2009; Kowert et al., 2014). Thus, games that require players to band together to achieve goals may provide an important source of social support, and developing and studying recovery interventions based on the social aspects of games may be beneficial for suicide prevention in men. Clinicians who want to learn more about these social benefits may find it useful to partner with organizations such as Stack Up ("Homepage – Stack-Up.org," 2018) to coordinate gaming gatherings in facilities and communities. Studies of such gaming interventions should also formally measure social support and meaning-related outcomes (e.g., reduced guilt or shame, feelings of empowerment) with valid empirical measures (Bryan et al., 2013).

Women in our sample primarily highlighted the cognitive and emotional regulation benefits of games but described their gaming as isolating. This may have to do with our sample of women or their choice of games—all women in our sample were over 45, and most preferred single-player mobile games. Characteristics of gameplay such as genre differ between men and women (Yee, 2017), so interventions for women may have a greater impact if they target goals related to decentering or distraction. Researchers should ensure that quantitative studies of any gaming interventions have enough statistical power to examine gender differences.

Although only a few of our patients discussed playing exergames, these games may help alleviate depression (Li et al., 2016). As we noted that some participants discussed the intense arousal they felt during gaming, one possible area for future research would be to examine whether it would be enjoyable and therapeutic to substitute vigorous play of an active game (e.g., a game involving dance or other intense movement) for games that are not physically demanding, such as racing or combat-focused games.

From a research perspective, games must be considered complex interventions: they have multiple aspects or features (e.g., genre, presence of a narrative) and may be played in different ways (e.g., cooperatively or competitively) within different settings (e.g., in-person or online). These factors require research designs that take that into account the complexity of multiple interactions (Colder Carras et al., 2018b). Passively capturing data about specific behaviors or combinations of behaviors within video games may be one way to predict mental health outcomes; such approaches have been useful in predicting the presence of mental disorders in Twitter users (Coppersmith et al., 2014). Going forward, it will be important to have experts in video game design, communications, public health and psychiatry—as well as gamers themselves—weigh in on which building blocks should be considered when creating and measuring data in game-based interventions, as well as problems related to excessive gaming (Colder Carras et al., 2018b, 2018a).

4.1 Study strengths and limitations

Our study was limited in that we used a small convenience sample of veterans. While we were able to describe some overall benefits of gaming in recovery, it is important to investigate what works, how and for whom in greater detail. We provided information about participants and context to enhance transferability; further research could explore these themes in larger veteran and non-veteran populations. In addition, while problems related to gaming were reported by many in our sample, more information is needed about the relative risks and benefits to mental and behavioral health caused by excessive or problematic gaming in clinical populations.

4.2 Conclusions

As with recovery itself, reasons for gaming and effects of gaming may vary widely within and between individuals, and individual factors and experiences (trauma exposure, "warrior" mindset), mental/behavioral health challenges (substance use, depression) and social context (current roles and relationships) are associated with different types of play and varying results. Gameplay may promote a mindfulness-like psychological decentering, but can also provide users with eudaimonic benefits of confidence, social connection, personal growth, and opportunities for employment or even leadership. These benefits are accessible to individuals with disabilities for whom traditional treatments, leisure activities or social interactions may be challenged by circumstances or limitations. As technological interventions, games could be implemented in large populations very inexpensively, thus acting as potentially very cost-effective recovery supports or mental health treatments (e.g., exposure therapy). However, relying on games to cope may also interfere with relationships, time management, or finances and lead to feelings of addiction. As there is currently a level of stigma surrounding video games that might prevent patients from speaking up, clinicians may wish to inquire about and discuss patients' video game play with them to help patients optimize their use of games to support recovery. Clinicians seeking to use digital health interventions to support veterans' recovery should consider the need for a design that fosters connection and promotes engagement.

Data access
Data is available on request from the authors. See Supplement 1 for Semi-structured interview guide and Supplement 2 for Framework analytic matrix.

Declaration of Conflicting Interests
The authors declare that there is no conflict of interest.

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Acknowledgments

Supplements

Supplement #1: Semi-structured interview guide

Introduction

Greeting
Introductions
Informed consent reminders and Q/A opportunity
Pseudonym Selection

1. To begin with, could you tell me a few things about yourself? Perhaps you could start with your hobbies, what your family is like, or anything else that you'd like us to know.
2. What are your daily responsibilities?
    a. What is stressful about them?
    b. What are some other sources of stress in your life right now?
3. Who do you generally hang out with on a regular basis? Family? Friends?
    a. Prompts:
        i. How are your relationships with your family and friends?
4. Who do you talk to about your personal issues?
    a. How receptive are these people to talking to you?
    b. How understanding are they of the stresses you face from being in the military?
5. What is it that made you decide to participate in this interview and share your video gaming experiences with us?

Video Game Play Habits

6. Can you tell me a bit about how you play video games?
    a. What types of games do you like to play?
    b. How often do you usually play, and for how long?
7. We're curious about your favorite games – can you name 3-5 games in the last year that you've played that you enjoyed the most? These could be mobile phone, table, Facebook, console, PC … any type of game.
8. What about your favorite games of *all time?* What are your 3-5 all-time favorite games?
9. So, thinking about all of these games, why exactly do you like them?
    a. Probe: (If a generic answer is offered, ask about a particular one of the games the first mentioned or the one where his/her eyes lit up).
10. It sounds like you mostly prefer [X type of] games … when you play these games, what kind of devices do you play on [ex laptop/desktop, console, mobile device].
    a. Where do you access the Internet? Do you ever have problems accessing it?
11. What's the most important reason you game the way you do?
    a. Probe: Is stress relief related? How?

      b. Probe: Is escaping from reality related? How?

      c. Probe: Is connecting with people related? How?

12. Now, can you please think back to the last time you played any kind of video game – when was that?

      a. Probe: Can you tell me about that day? What you were playing, with who, and for how long?

      b. Probe: Thinking back to that time, can you recall how you were thinking and feeling before, during, and after playing the game?

13. Now, how about the last day you didn't play video games? Can you recall how you were thinking and feeling that day? What did you do with your day?

User Experience

14. Thinking about the games you've played recently, what is it like for you when you are playing video games?

15. What draws you to video games?

16. Are you satisfied with the way you play? Or have you ever felt like you wanted to change something about your playing?

17. When you're playing, what makes you decide to stop?

Social Dimensions

18. Do you tend to play games alone, or with other people?

      a. Probe: When you play with other people, who are those people and what's it like to play with them?

19. Have you ever been a member of a guild or clan? What was that like?

      a. Prompt: [if player no longer belongs to one] Could you tell me about that?

20. Do you regularly use voice chat (in-game or Teamspeak, Mumble, etc.) to communicate with other players? If so, how do you think it affects the experience?

21. What kinds of other things do you do while you're gaming?

      a. Do you use other media, like texting or Facebook, or stay active in a chat channel or through instant messaging?

22. What gaming communities do you read, post to, or otherwise interact with online?

Military Experience

23. I'd like to ask about your military experience, and how that might be related to your gaming. If you don't mind, can you tell me a little about your experiences with the military?

      a. Probe: Have you ever been deployed to a combat zone?

      b. *Probe: What was your typical day like? (If not a desk job)*

24. Thinking about your time in the military, what was your gaming like while you were in?

      a. Probe: What about when you were deployed – did that change your gaming?

      b. Probe: Were there any very good or bad things you experienced related to gaming during that time?

25. Now, what about after you left the military – ~~did your gaming change in any way?~~ *Was your gaming different before/after, or did it change over time?*

26. ~~When you think about yourself – when you were a member of the military and now as a veteran – how would you describe your military identity?~~
      a. ~~How do you think people in society, in general, would describe you as a military member or veteran?~~
      ~~b.~~ *From your time in the military, how would you describe the average soldier? Would you describe yourself as that, or different? In other words, how do you see your identity as a member of the military vs. the norm?*

Veterans and Gaming

27. Now, thinking about how people tend to play games in general, do you think gaming has any particular advantages for veterans?
      a. Does this apply to you? Do you [restate advantage]?
      b. What about other positive outcomes – has gaming brought any positive changes to your everyday life?
      c. Possible probes: [dreams, mood, escape, caring for yourself, social-getting along with others, family, communication, education]: Explore basic domains of disability/functioning

28. What about the flip side – do you think gaming has any particular disadvantages for veterans?
      a. Does this apply to you? Do you [restate advantage]?
      b. What about other negative outcomes – has gaming brought any negative changes to your everyday life?
      c. Possible probes: [time, money, mood, self-care]
      d. You mentioned/didn't mention the idea of playing too much. Have you ever thought about changing the amount of time you game?
            i. What kind of strategies would you use/did you use to reduce the amount of time you spend gaming?
            ii. [If yes] How did you figure these out?

29. ~~When you think about yourself as someone how plays video games, how would you describe your identity as a gamer?~~
      ~~a. How do you think people in society, in general, would describe you as a gamer?~~
      ~~b. How do you think~~

29. There are lots of ideas about what counts as a game and what makes someone a real gamer. What do you think? How would you describe yourself as a gamer?

Mental Health

Now, I'd like to ask you a few questions about how gaming might relate to your health.
[reminder that the information generated is totally confidential and anonymous]
30. Would you mind sharing your diagnoses with me? Is that what you're being treated for?
    a. [If respond they have PTSD]: I realize this is a very sensitive topic, but if you feel comfortable answering, could you tell me if your trauma is related to your military service?
31. How, if at all, do you feel your diagnosis is related to video gaming – either in a positive or a negative way?
    a. Probe: Has gaming helped you cope with your diagnosis or manage your symptoms? How?
    b. Probe: Has gaming caused you any problems related to your diagnosis? How?
32. (How) does this extend to other types of media, like books or television, or the internet?

Has your treatment changed your gaming in any way?
Conclusion

Now, just a few more questions to wrap up:

33. If you were me, what do you think would be the most interesting thing to look at, in your opinion, about video game playing?
34. Do you think video games could help vets with PTSD, addiction or other mental health problems?
35. What do you think about the idea of game addiction? How would you know if someone had serious problems related to gaming?
36. May I ask you a few questions about yourself?
    a. How old are you?
    b. How would you describe your gender?
    c. How would you describe your race and ethnicity?
    d. Are you working, going to school, or doing something else?
        i. [If working]: Is this full time or part time work? Do you have a CWT or temp position?
    e. Education level/income – *If you don't mind answering, what is the source of your income?*
37. Is there anything you'd like to add?

Thank you so much for your time!

Supplement 2: Framework analytic matrix

Topic	Sample Themes
Important stressors	finances, relationship strain, dealing with people,
Mental or behavioral health problem	PTSD, depression, bipolar disorder, MST
Symptoms	anxiety, low self-esteem, racing thoughts, substance use
Relationship to gaming	relieves aggression, calming, prevents drug use, lifts mood, distraction
Recovery process	takes medication, sees counselor, goes to substance use recovery classes/groups
Military identity	productive member of society, warrior
Military experiences	leadership, combat, group cohesion, feeling dispensable, game-like, simulations
Individual and personality factors	irritable, doesn't like people, wants to give back, likes schedules
Resilience factors	supportive family/friends, full-time job
Gamer identity	casual, hardcore, not a gamer
Games and features	specific games played and currently played, general, changes in game play and game types over time
Positive features	anonymity, social, realism
Negative features	too social, notifications, realism
Reasons for gaming	aggression relief, coping, control, escape, keeps you occupied, etc.
Problems/annoyances with gaming	addiction, frustration, cheating
Gaming experiences during military service	playing with friends, strangers, self
Gaming experiences now	playing with friends, strangers, self
Gaming addiction	craving, spending money, interferes with life

Topic	Sample Themes
Linking real life and games	teamwork same as the military, can do things in games that you can't in real life, applying game strategies to real life
Suggestions for gaming and recovery	good for coping, match the game to the patient
Self-regulation strategies	keeping priorities in mind, discipline