



“When I was surfing with those guys I was surfing with family.” A Grounded Exploration of Program Theory within the Jimmy Miller Memorial Foundation Surf Therapy Intervention

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Abstract

Surf therapy is an intervention increasingly being utilized to tackle a range of health inequalities for military veterans. While increasing evidence demonstrates the effectiveness of surf therapy, there has been limited exploration of program theoretical explanations as to how it achieves positive outcomes. Theoretical understanding is important as it allows for service optimization, monitoring and further development. The current study utilized a pragmatic qualitative approach to explore theoretical mediators of the outcomes of Jimmy Miller Memorial Foundation (JMMF) surf therapy intervention. JMMF is a California (USA)-based program supporting military veterans facing mental and physical health challenges. Eighteen people who had participated in JMMF interventions (12 males and 6 females; mean age = 42 years; standard deviation = 11 years; range 28-71) were interviewed in depth about their experiences of the surf therapy intervention. Data were analyzed through constant comparative analysis and memo writing in line with pragmatic grounded theory. Two core intervention categories (relating to service delivery) were identified: “Constant challenge tackled at own pace” and “A non-judgmental familial safe space.” A further three individual categories (relating to participants) were identified: “Accomplishment,” “Respite,” and “Social Connections.” One contextualized category was identified; “Physical Therapeutic Elements.” Furthermore, a culture of “Reframing Failure” pervaded every element of the intervention. The findings demonstrated strong links to self-determination and flow theories which suggest potential theoretical frameworks for better understanding of the constructs that underpin surf therapy. The findings provide empirical evidence as to how best to optimize and expand JMMF service delivery in the US and potentially for surf therapy in wider veteran populations.

The mental health challenges experienced by military veterans are well-documented. In the USA mental health conditions are a significant burden for veterans and a major focus of the Department of Veterans Affairs (VA) service delivery (Maynard et al. 2017). Meta-analysis has found Post-Traumatic Stress Disorder (PTSD) prevalence rates of 23 % among US veterans who took part in Operation Enduring Freedom and Operation Iraqi Freedom that is far above general population prevalence of 7.8 % (Fulton et al. 2015). Veteran populations face increased risk for suicide compared with non-veterans (Kaplan et al. 2007;

McCarthy et al. 2009). Veterans account for 20 % of all suicide deaths annually in the US while only accounting for 1 % of the population (Department of Veterans Affairs 2010).

Physical activity, which includes structured exercise, has a strong evidence base for decreasing PTSD and depressive symptoms (Rosenbaum et al. 2015) including the use of ‘blue space’ interventions (Britton et al. 2018). Physical activity interventions have been demonstrated to be effective in addressing mental health challenges specifically for veteran’s populations (Goldstein et al. 2018, Shivakumar et al. 2017; Reinhardt et al. 2018; Marchand et al.

2018), including the use of surfing (Fleischmann et al. 2011; Rogers, Mallinson & Peppers 2014). Surfing as a physical activity intervention has been labelled 'surf therapy' by an international collaboration of organizations offering such programs: the International Surf Therapy Organization (www.intlsurftherapy.org). Surf therapy has been conducted in a broad range of contexts with a variety of populations. The most common outcomes include improved personal well-being and mental health alongside population specific outcomes.

While evidence for the effectiveness of surf therapy, in supporting positive mental health continues to grow, there has been limited research focus on *how* surf therapy achieves its outcomes. Although the mode of delivery is well-understood and is consistently implemented, in-depth understanding of the theoretical framework underlying surf therapy remains limited. Empirical exploration of program theory within surf therapy interventions targeting military veterans is currently limited to two studies. These studies utilized dialogical narrative analysis to explore participant experiences within a United Kingdom (UK)-based veterans' surf therapy intervention (Caddick, Phoenix & Smith 2015a, 2015b). A combination of observation and life history interviews highlighted peer relationships and a sense of respite achieved through surfing as key elements that underpinned the effectiveness of the program. To date these remain the only targeted theoretical investigations within surf therapy for veterans. Targeted investigation alongside young people facing mental health challenges also identified elements of respite and social components within surf therapy program theory while also suggesting basic human needs from Self Determination Theory as important components (Marshall, Kelly & Niven 2019). Translation of these findings to a veterans' context must be viewed with caution due to the very different populations examined.

Program Theory

A structured approach to describe such frameworks can be implemented through interrogation and description of program theory that underpin an intervention. Program theory offers comprehensive understanding of how an intervention works (Pawson 2006). Through investigation intervention pathways can be broken down into individual mechanisms which explicate or 'trace the destiny' of a program theory (Pawson & Tilley 2004). Visualization of program theory using a logic model allows for explicit theoretical mapping which is valuable for both academic researchers and surf therapy practitioners (Nutbeam & Bauman 2006). The logic model or map of intervention program theory can be used to enhance program delivery, quality control and outcome monitoring (Pawson 2006). Furthermore, an in-depth expression of program theory allows for expansion and scaling of projects (Pawson 2006). While continued effectiveness testing is still required, comprehensive program theory allows better targeting of efficacy evaluation and identification of plausible and testable mechanisms may add strength to claims of effectiveness (Bradford Hill 1965).

The current study aimed to build on previous work to improve understanding on *how* taking part in a targeted surf therapy program supports veterans facing mental health challenges. It will shed light on the contextual similarities between interventions of this kind in the USA compared with previous studies in the UK (Caddick, Phoenix & Smith 2015a, 2015b). The study aims to identify the program theory that links a successful surf therapy program's inputs to associated positive outcomes related to mental health and personal well-being. Such program theory allows for theoretical discussion, optimization of delivery and a pathway to future development of surf therapy for veterans. It will also allow for comparison of the key processes identified during initial development and testing of this

intervention (Rogers, Mallinson & Peppers 2014).

The Jimmy Miller Memorial Foundation

The Jimmy Miller Memorial Foundation (JMMF) (<https://jimmymillerfoundation.org/>) provided the context for this study. JMMF is a Californian charity that utilizes surf to support military veterans facing a wide range of challenges including PTSD, Traumatic Brain Injury (TBIs), anxiety, depression, addiction and homelessness. The program also works with active duty military through the Wounded Warrior battalion at Camp Pendleton (www.woundedwarrior.marines.mil/WWBn-W/) and with at-risk youth groups. JMMF was founded in 2005 in memory of Jimmy Miller. Jimmy was a LA County lifeguard and surf instructor who took his own life in 2004. Jimmy's family set up a legacy fund which enabled occupational therapists to develop a 5-week surf therapy intervention delivered to at-risk young people and veterans. A pilot study of the JMMF surf therapy intervention in veterans found clinically significant reductions in both PTSD and depressive symptoms (Rogers, Mallinson & Peppers 2014). The intervention currently runs as an opt in bimonthly club-based program. Veterans attend through the Greater Los Angeles Veterans Association Hospital or self-refer. Prior military service is the only official criteria, but referral pathways are designed to prioritize participants in need of support. Sessions consist of a half day of surf therapy including themed discussion on the beach, time in the water, a team debrief and a shared meal. Veteran and non-veteran volunteers from the local community provide one-to-one surfing support. Other support roles on the beach also contribute to the participant experience. JMMF was selected for this research due to their longstanding successful provision of surf therapy for military veterans and their commitment to maintaining an evidence-based program. The principal researcher

accessed a large pool of participants with varied and in-depth surf therapy experiences whilst remaining independent from surf therapy delivery.

Method

Theoretical Framework

The ontological framework for this study centered on pragmatic grounded theory (Timonen, Foley & Conlon 2018). This study focused on identification of a theoretical understanding of the social and behavioral components that lead to the intervention outcomes. Grounded theory provided an appropriate methodological approach to expand surf therapy's theoretical basis (Hutchinson & Wilson 2001). Concurrent data collection and analysis along with a constant comparative approach, memo writing and a theoretical sample of appropriate participant experience identify this study as grounded theory (Charmaz 2014; Schwandt 2007). The work undertaken was pragmatic with data collected in the practical, real world intervention setting (Harris 2015).

Ethics

Ethical approval was granted by the Edinburgh Napier University School of Applied Sciences Ethics Committee (22/08/2018). Written informed consent was obtained for all participants.

Sample

A purposive theoretical sample (Charmaz 2014) was utilized in line with grounded theory practice. Veterans who had participated in surf therapy with JMMF were invited to participate by JMMF gatekeepers, primarily by its lead practitioner. All but one of the participants had experienced a minimum of 4 surf therapy sessions with JMMF. One participant expressed an interest in taking part in the study after their first surf therapy session. Most participants lived in

the greater Los Angeles area. A small number of participants had attended JMMF surf therapy sessions previously but moved away from the area. The sample demographics are listed in Table 1. The broad age range (28-71) meant that veterans from a wide range of conflicts including Vietnam, 1st and 2nd Gulf Wars and

subsequent counter insurgency operations were included. The sample included non-combat and peacekeeping deployments undertaken by three arms of the US military. The high number of US Marine Corps participants reflects the personnel previously based at local military bases.

Table 1
Breakdown of Sample Demographics

| N | Male | Female | Mean Age | Age SD | Age Range | Marine Corps (USMC) | Army | Air Force (USAF) |
|----|------|--------|----------|--------|-----------|---------------------|------|------------------|
| 18 | 67 % | 33 % | 42.2 | 11.0 | 28-71 | 78 % | 11 % | 11 % |

Data Collection and Analysis

Interviews were conducted between September 2018 and October 2018 with a mean interview time of 50 minutes (range 19 to 82 minutes). Online video conferencing was used for 5 interviews for logistical reasons. The remaining 13 interviews were conducted in person at locations suggested by participants including local cafes, participant’s homes or on the beach. This maximized participants’ sense of control and comfort and facilitated more equal power-sharing between interviewer and participant. Quiet spots at said locations were prioritized to support confidentiality with protocols in place to move if space was too encroached upon. Said protocols were used on one occasion. In addition, informal discussion with practitioners and observation of surf therapy sessions enabled better understanding of the intervention context.

These pragmatic approaches facilitated research while allowing appropriately grounded focus on participant experience (Timonen, Foley & Conlon 2018). Interviews were semi-structured and opened with an open-ended question about participant experiences at JMMF surf therapy sessions. Further open-ended and non-leading questions allowed for exploration of participants’ experiences with opportunities to explore processes highlighted in previous literature (see Table 2). Prompts were used to further unpack relevant experiences while clarification prompting enabled better understanding of meaning (Charmaz 2014). The initial schedule was designed to ensure thorough exploration of participant experience. As interviews took place, additional questions were included to explore identified categories in keeping with grounded theories’ iterative approach (Charmaz 2014).

Table 2*Open-Ended Interview Schedule*

| Initial Open-Ended Interview Schedule | |
|---|--|
| Tell me about your experience of surfing alongside the Jimmy Miller Foundation. | How would you describe yourself as a person at the beach? |
| Can you talk me through your process of getting involved with Jimmy Miller? | Have you noticed any changes in yourself since you started surfing? |
| When you look back at your initial experiences surfing, are there any events that stand out in your mind? | Can you tell me what surfing now means to you? |
| Can you describe to me how you felt when you caught your first wave? | Can you tell me about working alongside the Jimmy Miller surf mentors? |
| Can you expand on the emotions you feel at the beach and in the water? | Can you describe to me your expectations of surfing prior to starting? (Follow up: How, if at all have these changed?) |
| Can you describe to me what it was like meeting with new people at the beach? | Is there anything else you think I should know to understand the Jimmy Miller Foundation? |
| Can you describe to me your experiences of the atmosphere at the beach? | Is there anything you would like to ask me in relation to anything we have discussed? |

All 18 interviews were recorded, and rough transcriptions were created using transcription software. Key interview segments were transcribed verbatim while filler was left in rough form. At this stage all participants were ascribed a pseudonym to protect confidentiality throughout analysis and reporting of results. This process of cleaning transcripts was repeated several times throughout data collection and analysis. Transcripts were analyzed in an iterative, emergent and non-linear manner comparing data obtained from different participants (Glaser 1978). Three stages of coding were utilized: initial, intermediate and advanced. All three stages were used throughout the concurrent data collection and analytical processes in line with established grounded theory practice (Charmaz 2014; Saldana 2009). A three-stage coding was utilized. The first stage focused on in-depth exploration and comparison of individual processes as reported by participants using gerund-

based codes such as 'being present'. These initial codes were in vivo where possible. The second stage involved extrapolation of initial codes into broader categories and synthesis of preliminary program theory. The final stage of analysis involved mapping of participant pathways within the synthesized program theory to understand directionality and relationships between categories. At all stages analysis remained grounded in participant experience. Audio interpretations were recorded as an alternative to written memos to facilitate reflection and mapping of the analytical process. Upon completion of 15 interviews similar categories continued to be identified alongside a strong program theory suggesting theoretical saturation (Charmaz 2008). Three further interviews were conducted offering further in-depth and diverse data but did not add to or change the nascent program theory. This further suggested that theoretical saturation had been achieved.

Reflexivity

Reflective audio was recorded throughout the study to highlight awareness of personal preconceptions, bolster credibility and supplement analysis (Charmaz 2014). The research team included a range of prior experiences around surf therapy practice, mental health, psychology and surf science. The range of different expertise allowed for open and regular discussion about prior assumptions and potential impact on whether conclusions were grounded in participant data. An example of reflective practice that came out of such discussions was the extensive use of prompts to thoroughly unpack participant experiences of surfing by the lead researcher. This

ensured thorough understanding of participant experiences as opposed to imposition of own beliefs based on the lead researcher’s previous surfing experience. Other members of the research team with limited surfing experience were also of assistance in this regard.

Results

Program Theory

Figure 1 is a logic model representing the program theory that was constructed from participant interview data. Seven emergent categories were identified as pathways from intervention inputs to associated outcomes and reflect three different domains: *Intervention, Individual and Contextual*.

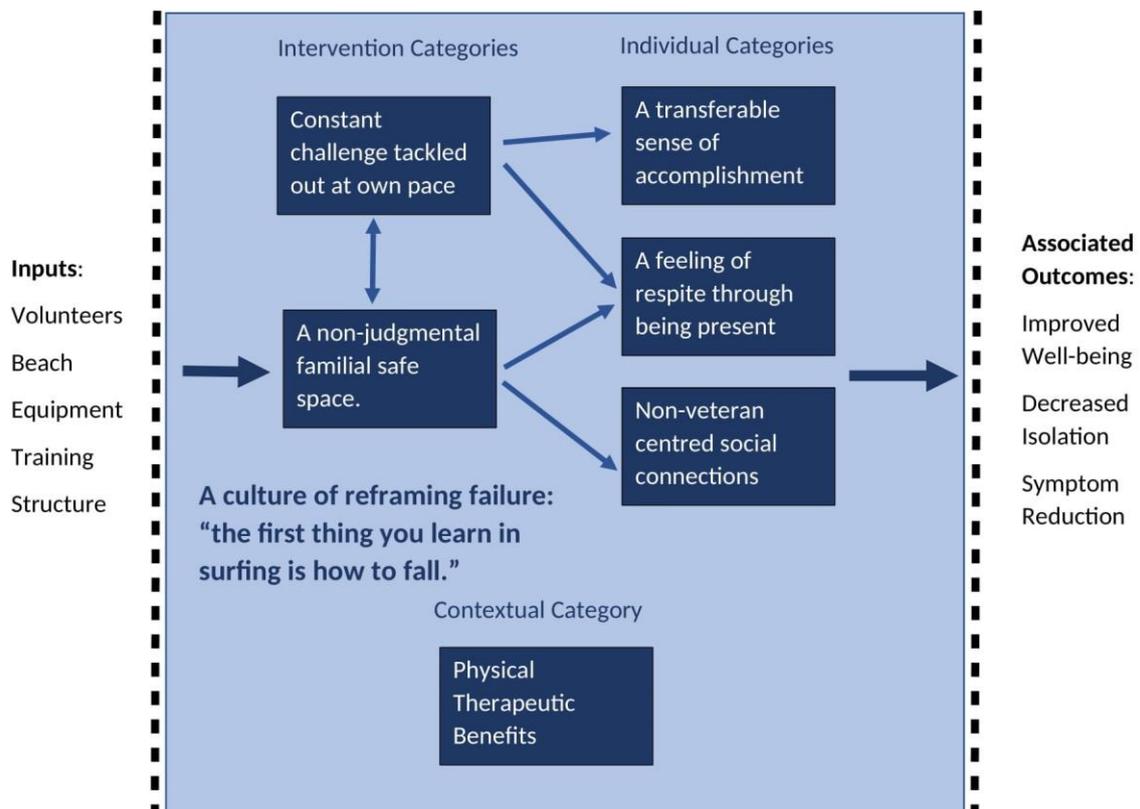


Figure 1. Logic Model of Program Theory for JMMF Surf Therapy Intervention

The first two categories were labelled intervention categories as they primarily related to processes facilitated by the intervention itself. The final three categories were labelled individual

categories as they relate to individuals’ surf therapy experiences. Constant comparison of data throughout analysis highlighted salience between participant experiences and all categories apart from one example.

One contextualized category was identified contingent on one specific participant experience. This category was reported due to the insight it offered to a specific subsection of the sampled population. Final stage analysis allowed for mapping of directionality and relationships between categories. The program theory was framed within the culture of the intervention.

Intervention Culture

The intervention reframed what it was to fail through surf therapy. The quote, “the first thing you learn in surfing is how to fall,” was frequently spoken by the lead practitioner and was utilized at every single session attended. This ethos pervaded every element of the intervention, including all listed categories, and was identified as ‘culture’ rather than a discrete category. Participants highlighted how this culture positively impacted their experience providing encouragement and positive reinforcement.

“They were saying specific technical things about what we could do to improve but they were saying things in a positive way, they never said anything in a negative manner. So that was a, I believe that was structurally built into the program where if we did something wrong, they would just say, if you try it this way, it’ll give you better results. Instead of saying, don’t do it that way.” Michael, US Army

“The way they explain it to you, you don’t feel like a failure, you feel, like, OK I can do this. This is part of the surfing experience.” Jane, USMC

This reframing of failure was highlighted as an important lesson that could translate into other life situations and contrasted with the intense performance-based mentality that many veterans experienced in active service.

“If you fall off, just get back up man, it was a cool metaphor for life, just get back up man it’s life.” Will, USMC

“And all these things, instead of being performance based, I just realized I just need to be me.” Jimmy, USMC

JMMF’s reframing of failure pervaded the program theory, supporting other categories, enabling pathways and was associated with positive mental health outcomes. This culture reflected the actions of staff and volunteers and was reinforced throughout intervention delivery.

Intervention Categories

Constant Challenge Tackled at Own Pace

Participants identified that surfing was challenging although their expectations varied regarding the degree of difficulty. Some participants thought it might be easy to learn prior to their first attempt. The challenge continued to be identified even as participants progressed.

“I thought it was going to be super easy, that was my first expectation and I was quickly humbled by the ocean.” Ryan, USMC

“I’m pretty good at being able to do what I want to do physically, and here I am not being able to keep my balance.” Will, USMC

Participants highlighted how the challenge was balanced by the focus on learning at one’s own pace. This focus was supported by the patience and encouragement offered by intervention staff and volunteers.

“If you don’t get it on the first couple tries, don’t even worry about it, don’t sweat it. The waves never end so you can keep going.” David, USMC

"It's not a competitive space, it's an inclusive challenging space." Michael, 47, Army

"They (the intervention staff/volunteers) practiced patience and encouragement really just verbally said, it's okay just try again. It's a very powerful thing." Will, USMC

Furthermore, the focus on surfing skill development at one's own pace was highlighted as being critical to participation by individuals facing major physical challenges.

"With Jimmy Miller foundation I was like hey I can't walk yet, I can't stand up yet so they would actually like have me just lay on the board and lay down and surf and body surf and slowly I started getting up and it wasn't like 'get up, stand up, go faster' it was kind like take your time, don't get hurt but have fun, of all things have fun." Jessica, 28, USMC

A challenging task conducted at a self-selected pace was consistently highlighted as a key element of participant experience and for some was fundamental to being able to take part. This approach, which was facilitated by those delivering the intervention, also seems to have underpinned individual categories that form part of this program theory.

A Non-Judgmental Familial Safe Space

Participants cited how the intervention fostered a non-judgmental safe space often drawing comparisons to a supportive family network.

"So, when you talk about the Jimmy Miller environment, it's a matter of emotional safety." Michael, US Army

"The way that they create the environment, it's like, you can tell

that they're family off the bat, but it's an open family, and then you're welcome to walk in and experience, you know, the love and the joy and the surfing." Kimberly, USAF

This safe space was facilitated by elements of the intervention including how staff and volunteers conducted themselves, as well as the structure of service delivery. Participants often highlighted that there was a complete lack of judgement of individuals, of either how they were in the past or in the present. For participants this was a novel and extremely rewarding experience helping to break down isolation.

"I have been isolating myself for seven years, I began to realize that there's, there's actual people out there that care about me, and I'm gonna be safe to be around." Michael, US Army

The structure of the sessions further promoted this idea of a safe space through participation in a non-clinical sharing. This consisted of joining in a circle to discuss a positive theme as part of the surf therapy session. Participants emphasized how this gave an opportunity to share their feelings and how participation by everyone, staff and volunteers included, made it easier to share themselves.

"They're teaching me but they're sharing too. Um, so I guess it kind of broke down that barrier for me of like, Oh, this is somebody who's in authority, which I, you know, usually have issues with, whereas, you know, they're human. And they're opening up so I could be open." Kimberly, USAF

"So, you have other non-military people sharing their feelings because that will automatically put a military member more at ease, because if they are doing it why not?" Joe, USMC

This safe space created through the structure and the delivery of the intervention seemed integral to overall participant experience in the program and specifically enabled later individual categories related to social connections. The importance of this safe space at the intervention is highlighted by one veteran who compared it to their feelings in wider life.

“Whenever you start getting back into society from wounded warriors or veterans in general, even if you are going out to Walmart, or to the gym, or the mall, you kinda sit in your car and you just like I’m really anxious to go into the public right now. It’s all these different emotions but when you roll up to the beach for Jimmy Miller, it had to be the first place that I didn’t get anxiety at.” Jessica, USMC

Individual Categories

A Transferable Sense of Accomplishment

Mastering aspects of surfing, the aforementioned challenging task, resulted in a real sense of accomplishment. A feeling of achieving something that many thought they would never be able to do. This was further facilitated by the intervention reinforcing this accomplishment wherever possible.

“I realized I was the only one that was standing and surfing, it was just one random wave that I got on my own and I think every blue shirt (volunteers) on the beach was cheering like, like I was about to like, score the game winning goal for the World Cup.” David, USMC
“It’s success and achievement every single step of the day.” Jane, USMC

Participants reported that this sense of accomplishment was transferable to wider life. This feeling of accomplishment reinforced individuals’ sense of capability

challenged self-doubt or reminded participants of achievements when things were not going well.

“Certainly (surfing) means to me that I mean, in a very, very big picture, like I really can accomplish anything that I put my mind to. So yeah, something I thought was impossible, that I would never enjoy, never could be good at.” Steph, USMC

“The accomplishment helps you long-term, because honestly then you are not just fixated on this week has been crap.” Jessica, USMC

This transferable sense of accomplishment was linked to specific instances where it helped to tackle other challenges in life. One veteran reported how their own sense of accomplishment in surfing gave them the confidence to tackle some tax issues that had been too intimidating for them to address. Such examples highlight the place of a transferable sense of accomplishment in this program theory and possible pathways to associated mental health outcomes.

A Feeling of Respite Through Being Present

Veterans interviewed reported a feeling of respite from negative emotions, symptoms and memories that may otherwise be persistent throughout daily life through surfing with JMFF.

“And I remember the first time I went surfing, I was more in a depressive state. And so, when I caught that wave, but I almost felt like I was kind of rising above like, a lot of the situation or the gunk.” Kimberly, USAF

“You go surf with those guys, because no matter how bad things had got, whenever I got into the ocean is just like everything got washed away.” Jimmy, USMC

This feeling of escape provided respite in the moment, however participants also reported that it was transferable to other situations such as avoiding or coping with a PTSD flashback. One veteran explained how going back to this feeling of respite helped them to cope with flashbacks related to the noise of fireworks.

"I had a PTSD moment where there's like these firework shows up and my doctor told me just think back where a place where you're more calm and I thought about the ocean surfing [...] I thought about surfing and I just literally felt so relaxed you know. Those (fireworks) to me sound like mortar rounds, that whistling noise that got me in Iraq, like constantly were attacked by mortars yeah, three times a day average." Justin, USMC

In another example one participant described how the respite provided by surfing provided hope for future respite even when personal circumstances may be in a very negative place.

"You can't wait for the next one because you know if you're having a rough time, or if you know, you're suicidal or if you're injured or whatever, you know that you are going to have a good day when you go (JMMF)." Jimmy, USMC

Participants noted that the feeling of respite was facilitated by the complete focus that surfing demanded. A combination of the challenge of the activity itself and the need to be present and aware of the ocean environment left little space for negative thoughts or emotions.

"Whatever stress I had, from school or whatever, I didn't think about it at all because I was so focused on the task in hand." Will, USMC

"You really have no choice but to be present. Like, even if you start having conversations about something. Sometimes waves will come and knock you over like hey pay attention. So yeah, it's, it's like, it's a good practice in being present without like, having to try hard at it. Just really kind of natural." Brad, USMC

The need to be focused and present and the accompanying positive feelings were highlighted by one participant who reported elements of temporal distortion while riding on a wave.

"Pure, happiness, unless you have done it it's a feeling that's very hard to describe, it's like everything slows down. Your entire life just, not so much pauses but is very slow motion as you go through the section (of the wave), and it's just incredible." Brad, USMC

The feeling of respite from negative emotions, thoughts and symptoms that may be present in veterans' wider lives seems to be a very important element of participants' experiences with JMMF. Not only was respite experienced in the sessions but it was also linked with transferability to other situations, leading to better mental health outcomes.

Non-Veteran Centered Social Connections

Participation in the intervention enabled creation of new social connections both in session and more broadly. This was highlighted as particularly important for veterans facing forms of social isolation.

"I mean like I said I was fucking alone bro I was I was like really fucking alone and I'm not anymore. Yeah you know just being able to you know go out with other people who actually like want me there, this is just night"

and day from how life used to be.”
Dan, USMC

“To be able jump into like a kind of pre-made community right there was pretty cool. I already felt comfortable. I felt compassion towards myself and towards everybody there and felt accepted into something a little bit bigger than just us.” Brad, USMC

One aspect of these new connections that participants highlighted as especially important was breaking out of self-imposed veteran centered comfort zones and engaging with other non-military communities. This was cited as a big step for many of the veterans spoken to.

“Connecting with a community where there is both veterans and people that have never been in the military is one of the most healing things for me as far as social skills helping me transition back, that I can find.”
Brad, USMC

“It eliminated that whole us vs them thing, you know us vs civilians, it was more like just us.” Will, USMC

The fostering of new social connections, in particular non-veteran centered social connections, was a critical element of participant experience surfing with JMMF. The ways in which this broke down reported isolation among participants offers a possible pathway within this program theory leading to better mental health outcomes.

Contextualized Category

Physical Therapeutic Elements

One of the participants reported how taking part in surf therapy greatly supported their rehabilitation following an accident. Physical elements related to the water and the sand were cited alongside the element

of taking part in stealth physical therapy masked by a fun activity.

“Through Jimmy Miller, I definitely learned how to walk again, wasn't scared to fall in the water. [...] It's fun, fun and more fun.” Jessica, USMC

“It put my muscles and nerves through therapy that no hospital setting could imitate.” Jessica, USMC

Furthermore, improvements to physical challenges faced by participants could contribute to mental health improvements associated with the JMMF intervention for this participant. While an isolated example within this study, and not the primary focus of this work, it is important to note the physical therapeutic elements surf therapy may offer.

Discussion

The study aimed to further explore theoretical underpinnings, of the emerging paradigm of surf therapy, by empirical investigation of the JMMF surf therapy intervention. A visualization of the identified program theory was presented as a logic model in line with established intervention evaluation techniques (Nutbeam & Bauman 2006) while remaining grounded in participant experiences (Timonen, Foley & Conlon 2018).

Self Determination Theory (SDT) has been previously highlighted as a possible theoretical framework for exploring surf therapy program theory (Marshall, Niven & Kelly, 2019). The current study supported this suggestion by highlighting the importance SDT concepts including autonomy (e.g., *constant challenge tacked at own pace*), competence (e.g., *a transferable sense of accomplishment*), and relatedness (e.g., *non-veteran centered connections*). These three concepts are identified within SDT as basic human needs (Ryan & Deci 2017) and as such it is not surprising to see

them as integral to a program aimed at boosting mental health and personal well-being. The use of SDT as a framework for physical activity is well established (Perlman & Webster 2011; Saebu, Sørensen & Halvarial 2013; Fenton, Duda & Barrett 2016) although the focus is often on behavior change in relation to promotion of and adherence to physical activity. The use of SDT models specifically for mental health and well-being was previously identified (Ng et al. 2012) and the current study tied these established theoretical pathways to intervention processes and structures that can be translated to or replicated in other contexts. Thorough investigation of intervention categories provided key insights into successful implementation of SDT frameworks that are focused on human need fulfilment within a mental health intervention context.

Along with SDT the concept of respite has previously been investigated within surf therapy delivered to military veterans (Caddick et al. 2015a, 2015b). The 'distraction' hypothesis was linked with physical activity and improved mental health (Biddle, Gorely & Mutrie 2015) maintaining that physical activity provides a general sense of distraction from negative mental health symptoms. However, the findings in this study offer an alternative theory for this pathway in the form of Flow Theory (Csikszentmihalyi, 2002). Flow theory describes a mental state in which an individual is completely immersed in the task at hand and is commonly described as being 'in flow' or 'in the zone'. Participant experiences from this study described respite from negative thoughts, emotions or symptoms while surfing. As the task demanded their full attention, to the point where they could not think about anything else. This matches the description of flow state, alluding to complete involvement and a sense of serenity (Csikszentmihalyi, 2002). Other participant experiences that were potential markers of a flow state include: timelessness or temporal distortion, intrinsic motivation to surf, inner

clarity and a sense of ecstasy (Csikszentmihalyi, 2002). The requirements for flow state also appear to be present, clear goals identified by participants and immediate feedback available. These goals could include simply getting in the water, riding board prone or riding standing. Immediate feedback was provided either through falling or by volunteer surf instructors (Csikszentmihalyi, 2002). The autonomy provided to participants via self-selection of goals and progressing at their own pace, combined with the ongoing challenge of surfing, also links to the skill challenge balance model identified as necessary for flow (Csikszentmihalyi, 2008). Flow theory has been previously linked to surfing (McKenzie, Hodge & Boyes, 2012) and to positive mental health (Nakamura & Csikszentmihalyi, 2009) but there has been limited study of how flow can be employed in interventions. The appearance of flow within the JMMF surf therapy intervention and the way in which it offers a potential pathway to mental health improvements through respite is therefore a novel finding.

The JMMF program theory can be divided horizontally between surfing elements and social elements of the intervention. Surfing-based pathways related to accomplishment can be linked with SDT and can also be linked with existing theories on mastery and self-efficacy that are well-established in mental health research (Bandura 1997; Carless & Douglas 2010; Lubans et al. 2016).

Alongside surfing-related elements we identified social pathways related to the creation of a safe space and making new social connections that also link with prior research. Creation of safe spaces within a mental health setting has been discussed previously (Bryant, Tibbs & Clark 2011) with safe spaces characterized as "a lack of judgement with a focus or respect for others and with a psychological sense of community" (Walker, Hart & Hanna 2017, p.54). Combining a safe space with a sporting/physical activity intervention has

been identified in previous surf therapy research (Marshall, Niven & Kelly, 2019). Safe space provided by the intervention and facilitation of other social connections was critical. The debilitating effect of social isolation was frequently noted by participants, which echoed other literature examining this population (Wilson, Hill & Kiernan, 2018). Furthermore, the way in which the intervention builds upon this safe space, to promote positive interactions with civilians, appeared integral in breaking down social barriers for veterans. It may be that not including civilians within the surf therapy program might maintain social barriers and be less conducive to successful acculturation to civilian life. The successful provision of a safe space, inclusive of civilians, within this intervention seems to have been integral to positive participant experience. This can be replicated in other interventions targeting this population with other therapeutic modalities.

The possible physical therapeutic effects of surf therapy were reported by one participant in this study. Given what was reported, even by a singular participant, it is worth noting possible physical therapeutic effects linked to surf therapy that have been previously described (Fleischmann et al. 2011). Further research into the physical benefits of surf therapy and their links to mental health outcomes is warranted.

Implications

This study provided a grounded iteration of program theory for the JMMF surf therapy intervention. These findings include novel theoretical observations, while also connecting with established theory, to provide clear pathways from known inputs to associated outcomes. This work adds to the emerging evidence base surrounding surf therapy, both in terms of understanding program theory, and providing plausible theories to account for effectiveness.

Practical implications include service optimization and development and the program theory has been presented to support implementation by practitioners. An elucidated program theory allows for the JMMF intervention to optimize its service delivery by focusing on key aspects of the program identified in this study. This could involve specific volunteer training related to the provision of a safe space or emphasizing that participants should work at their own pace while at the beach. This could also inform similar interventions for veterans in the US. The inclusion of civilians within this intervention suggests that other interventions could employ a similar approach to break down social isolation and promote veteran acculturation. The utilization of the SDT framework, married to clearly expounded intervention processes and structures, offers a key bridge between the theoretical and the practical in terms of mental health outcomes. While further examination in other contexts is needed, the program theory iterated here offers a clear framework for future intervention design. Furthermore, the intervention categories that underpin the JMMF program, while evident in surfing, are not unique to this sport. Self-paced challenges can occur in a range of adventure sports, such as climbing or mountain biking. This offers the potential for the current findings to support mental health intervention discussion, design, implementation and evaluation across a wide range of paradigms tailored to local needs and context. These findings provide a foundation for community psychology practitioners to better integrate surf therapy into usual PTSD treatment for veterans or to adapt non-surf specific findings to contextual treatment and intervention opportunities.

The identification of flow theory as the mechanism for respite from negative emotions, thoughts or symptoms is another potentially novel theoretical approach to intervention design. The pre-requisites of flow are well established and could be built

into a wide range of interventions beyond surf therapy or other physical activity paradigms. Future research should incorporate empirical testing of the presence of flow states within surf therapy using validated tools (Jackson & Eklund, 2002). Identification of probable flow states within surf therapy in the current study, paves the way for such empirical testing, and could have wider implications for other mental health interventions.

Strengths and Limitations

Study participants were heterogeneous in relation to age and were drawn from three arms of the US military who had undertaken a wide range of deployments. The gender split of 66 % male to 33 % female differed from total US military forces where males make up 83 % of service members (US Department of Defense, 2016). There were no noticeable gender differences in participant experiences identified in this analysis. It is possible that this reflects wider trends of males having more negative attitudes to mental health support (Gonzalez, Alegria, & Prihoda, 2005). An attempt to match the military gender make-up by purposive sampling was not undertaken as the primary goal was to identify participants with rich experiences of the JMMF program. It is possible that different experiences could have been reported by other program participants who did not contribute to this study.

While extensive background research was carried out prior to data collection the lead researcher's status as a UK citizen limited interaction with US military services that support the transition from active duty to civilian life. Further exploration, experience and understanding of this process may have been useful given it was frequently discussed in interviews. Interviewing key workers within these services may have facilitated further triangulation (the convergence of conclusions based on experiences of different stakeholders) and provided better understanding of where the

JMMF interventions fits within the wider veterans' service landscape.

Conclusion

This study provided a pragmatic grounded exploration of program theory within the JMMF surf therapy intervention. This was visualized in a logic model highlighting pathways from known inputs to associated outcomes. The findings offer practical suggestions for the intervention in terms of service optimization and future expansion. Furthermore, this work contributes to the emergent surf therapy evidence-base offering plausible theoretical understanding. The study also highlights future research priorities including the importance of Self Determination Theory and Flow Theory within both surf therapy and veterans' interventions more broadly.

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