

## Research Article

# Community organization factors affecting veteran participation in adaptive sports

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**Objective:** This study aims to describe United States military veteran participation in adaptive sports and to assess the demographic make-up and organizational characteristics of existing adaptive sports programs.

**Design:** Prospective, cross-sectional survey.

**Setting:** Community organizations with adaptive sports programs.

**Participants:** 85 adaptive sports programs.

**Interventions:** Nine question survey.

**Outcome Measures:** Demographic data and sports offered by adaptive sports programs in the United States.

**Results:** The survey response rate was 70%. The median number of total participants in an organization was 75 and the median number of veterans was 50. 76% of organizations had some degree of affiliation with a VAMC. Organizations affiliated with a VAMC are more likely to be rehabilitation centers, whereas community organizations with no VAMC affiliation are most commonly independent organizations with no rehabilitation component. Individuals of all ages participate in adaptive sports, with increasing participation associated with increasing age. Golf was the sport offered most commonly by adaptive sports programs in this survey. Low-contact sports were offered more often than high-contact sports, and the majority of programs offered adaptive sports year-round.

**Conclusions:** Our results suggest that U.S. Military veterans represent a large proportion of the individuals participating in adaptive sports. Further research specifically focusing on factors veterans find desirable when considering participating in adaptive sports is indicated to identify programs that should be promoted, developed, and funded to increase veteran participation in adaptive sports.

**Keywords:** Adaptive sports, Veterans, Sports participation, Veterans affairs medical center, Participation rates

## Introduction

Adaptive sports are broadly defined as conventional sports that have been modified to meet the needs of people with physical and/or intellectual disability. Classic examples include wheelchair basketball and seated skiing, but any sport that has been altered to allow individuals with disability to participate would fall under the umbrella of adaptive sports.

Although the physical and psychosocial benefits associated with sports and recreation are well-documented in the literature, the majority of research has focused on able-bodied individuals. Recently, an emerging body of literature dedicated to individuals with disability has demonstrated that participation in adaptive sports is associated with similar benefits, including chronic disease prevention, increased muscle strength, improved sense of self-esteem and self-image, as well as better social integration.<sup>1,2</sup> Additional studies have even suggested participation in adaptive sports makes a difference in attaining employment.<sup>3</sup>

Among those with disability, U.S. Military veterans are a particular group of interest in part due to the

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influx of veterans living with disability in the post-9/11 era. Data from the 2014 Census demonstrates that there are at least 3.8 million veterans living with service-related disability.<sup>4</sup> Though the number of veterans participating in adaptive sports is unknown, we estimate that it is a very small fraction of this population. Given the documented physical, psychosocial, and socioeconomic benefits associated with adaptive sports, it is critical to identify ways to increase participation rates among veterans with disability.

Known barriers to participation include difficult access to transportation, limited information about programs and their offerings, individual cost, and program funding.<sup>1</sup> Clearly many of these obstacles are cost-related. Depending on the organization, financial support usually comes from a combination of fees for service, individual donations, and grants. While grants can take many forms, one example dedicated to veterans with disabilities is the U.S. Department of Veterans Affairs Adaptive Sports Grant Program, which awards grants to adaptive sports organizations to “plan, develop, manage, and implement programs to provide adaptive sports opportunities for disabled Veterans and disabled members of the Armed Forces”.<sup>5</sup> In 2019, this program awarded \$14.8 million in federal grants to 123 adaptive sports organizations across the country.<sup>6</sup>

Despite the large number of adaptive sports programs in the United States, little is known about the organizations that provide adaptive services. To our knowledge there are no studies that specifically focus on the demographic makeup of adaptive sports organizations. The purpose of this study is to describe demographic make-up and organizational characteristics of existing adaptive sports programs.

## Methods

This was a cross-sectional study of community organizations that offer adaptive sports programs. A short survey was created by the investigators of the study and piloted with several organizations known to the authors. Following this initial pilot, the refined 9-question survey was distributed to 121 programs across the United States via Survey Monkey<sup>®</sup> along with a cover letter explaining the project. Participating organizations were identified if they advertised in the resources section under “Sports and Recreational Organizations” on [https://www.sportsabilities.com/\[STATENAME\]](https://www.sportsabilities.com/[STATENAME]) and the surveys were sent to the email associated with each program. Programs were excluded from the study if there was no email address on their web page. Additionally, surveys were sent to programs

known to the authors, but not listed on the Sports Abilities website. Further inclusion criteria required that the program be based in the U.S. and also recognized as a formal organization, rather than an informal group.

Organizations were asked for the name of their organization and the position of the individual filling out the form within the organization (questions 1 and 2). No individual person’s name was asked. Additional demographic data was obtained, including the organization’s status as independent vs. associated with a rehabilitation facility (question 3), the total number of participants in 2017 (question 4), the number of veteran participants in 2017 and percentage of participants that were veterans in 2017 (question 5 and 5b), the age groups of the participants (question 6), the types of sports offered by the organization (question 7), the seasons in which programs were offered (question 8), and lastly whether the organization had a formal relationship with the local Veterans Affairs Medical Center (VAMC) (question 9). Sports were grouped into low-contact, contact, and high-contact categories by the investigators according to author experience (see [Appendix](#)).

Regarding the age groupings – Age was categorized into five subgroups: 10 and under, 11–17, 18–25, 26–34, and 35 and older. The age ranges for these groups were determined by several factors. Age 17 is the minimum age to join the U.S. military, but parental permission is needed. At age 18, an individual can join the U.S. military without his or her parent’s consent. Therefore, we decided to have a cutoff between ages 17 and 18. The maximum age to join the U.S. military differs by the branch of service. The age requirements for Active Duty enlistees by branch are as follows: Army (17–35 years old), Marine Corps (17–29 years old), Navy (17–34 years old), Air Force (17–39 years old), Coast Guard (17–27 years old).<sup>7</sup> Since Army and Navy are the two largest branches, 35 years old was determined to be an appropriate cutoff for our upper age group.

Descriptive statistics were performed. The primary outcomes of this study included the median number of total participants and the median number of veteran participants within an organization. Secondary outcomes included organization affiliation with a Veterans Affairs Medical Center (VAMC), organizational status (Independent vs. Rehab Organization), ages of participants, the number and types of sports offered by each organization, contact level of sport offered by each organization, as well as seasonal offerings of adaptive sports programming.

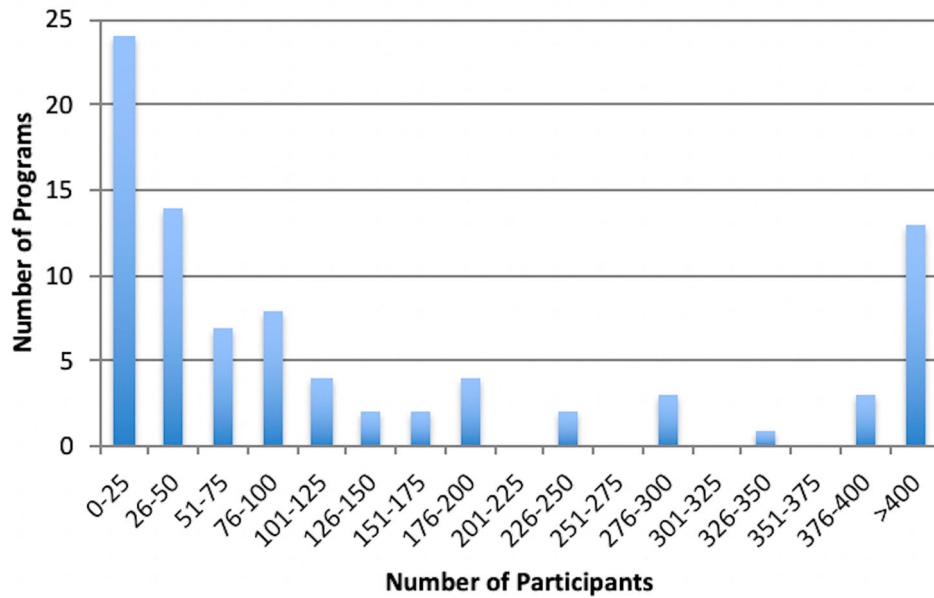


Figure 1 Total participants per program.

This study was entirely voluntary and participants were informed that they could withdraw from the study at any time. The study was approved by the Institutional Review Boards at George Washington University and the Clement J. Zablocki Veterans Affairs Medical Center.

**Results**

The response rate to survey distribution was 70%. The median number of total disabled participants per year in a program was 75 (range 4 to 3000) (Fig. 1). The

median number of veterans within a program was 50 (range 0 to 2200) (Fig. 2).

76% of all programs had some degree of affiliation with a local VAMC (Table 1). In terms of organizational status as independent vs. associated with a rehab center, programs were equally divided between the independent programs (50%) and those affiliated with rehabilitation centers (50%). When organizational status was stratified based on affiliation with a VAMC, 95% of the VAMC programs were rehabilitation programs, compared to only 9% rehabilitation programs with the non-VAMC responses.

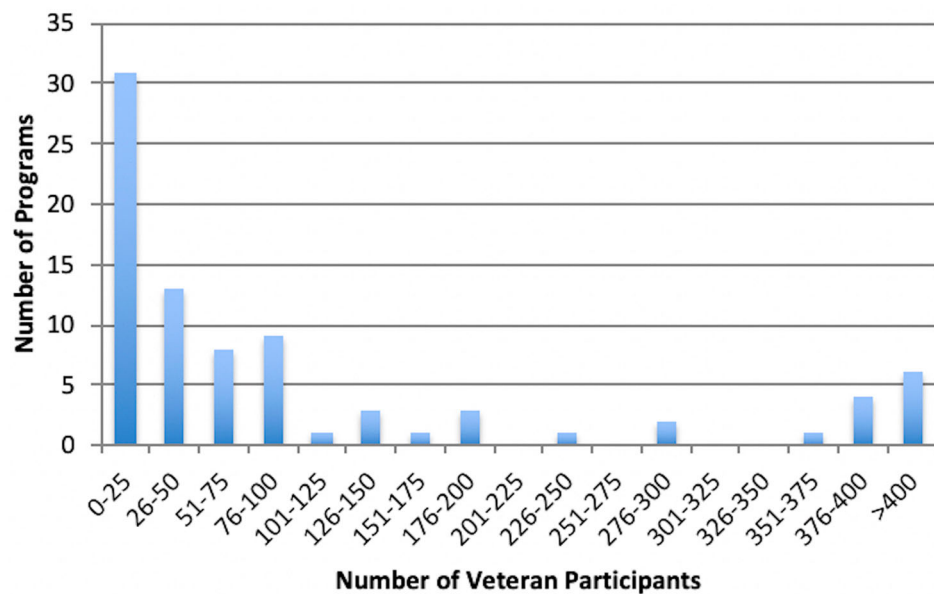


Figure 2 Veteran participants per program.

**Table 1** Survey results.

Variables	Number of programs (%)
N	85
Association*	
VAMC	39 (46.43)
Community	45 (53.57)
Organizational Status (All)*	
Independent	42 (50.00)
Rehab Center	42 (50.00)
Organizational Status (VAMC)	
Independent	2 (5.13)
Rehab Center	37 (94.87)
Organizational Status (Non-VAMC)	
Independent	41 (91.11)
Rehab Center	4 (8.89)
Affiliation with VAMC	
Yes	65 (76.47)
No	20 (23.53)
Age Group	
0–10	14 (16.47)
11–17	23 (27.06)
18–25	55 (64.71)
26–34	63 (74.12)
35+	80 (94.12)
Most Commonly Offered Sports	
Golf	39 (45.88)
Hand cycling	38 (44.71)
Yoga	36 (42.35)
Kayaking	35 (41.18)
Cycling	35 (41.18)
Bowling	35 (41.18)
Fishing	34 (40.00)
Wheelchair basketball	33 (38.82)
Archery	31 (36.47)
Bocci	27 (31.76)
Level of Contact	
Low	67 (78.82)
Contact	52 (61.18)
High	50 (58.82)
Season	
All Year	70 (82.35)
Seasonal	15 (17.65)

\*One program did not report association or organizational status.

16% of programs had individuals ages 0–10, 27% of programs had individuals ages 11–17, 65% of programs had individuals ages 18–25, 74% of programs had individuals ages 26–34, and 94% of programs had individuals age 35 and older (Fig. 3).

On average, organizations offered 9 different sports. The ten most commonly provided sports were (1) golf, (2) hand cycling, (3) yoga, (4) kayaking, (5) cycling, (6) bowling, (7) fishing, (8) wheelchair basketball, (9) archery, (10) bocci. 78% of programs offered at least one low contact sport, 61% offered at least one contact sport, and 59% offered at least one high contact sport.

With regard to the seasonal offerings of adaptive sports, it was found that 82% of programs offered services year-round while the remaining 18% offered seasonal programs.

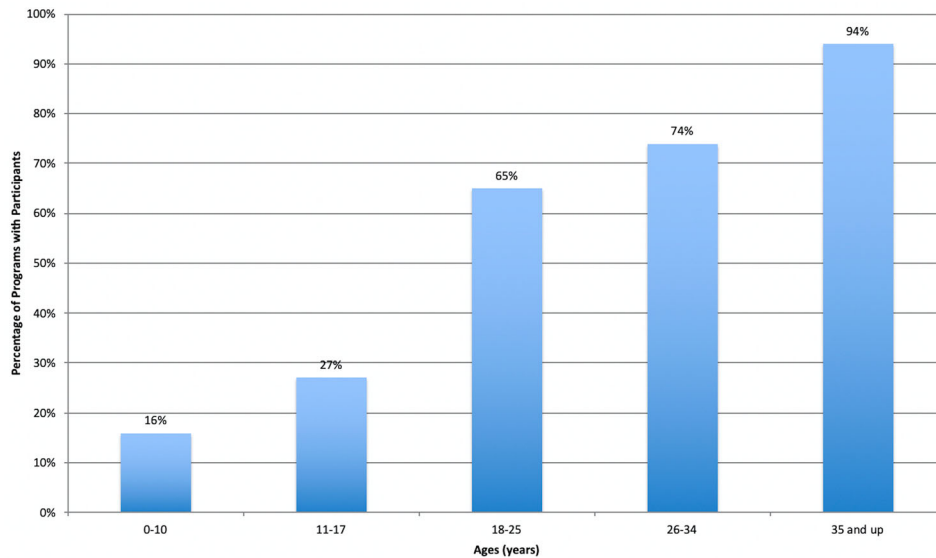
## Discussion

Returning service members can face significant difficulty integrating into everyday life.<sup>8</sup> Physical disability, intellectual impairments, and unemployment are common adversities faced by veterans returning to civilian life, with studies citing up to 29.6% of veterans reporting any disability and 25% reporting one or more mental illnesses.<sup>9</sup> Notably among both able-bodied and disabled veterans, Tran *et al.* found that veterans who were unemployed for longer than 27 weeks reported poorer physical health compared to civilians who experienced long-term unemployment.<sup>10</sup> With regards to veterans with disabilities in particular, others have found the unemployment rate significantly higher in this population when compared to veterans without disabilities.<sup>11</sup>

Despite these statistics, certain qualities learned in the Armed Forces, such as perseverance and teamwork, can serve to support veteran assimilation into civilian society.<sup>12</sup> These same qualities that were valuable in the military can be channeled into adaptive sports, which have been shown to positively impact quality of life among veterans. For example, adaptive sports have the potential to improve the lives of their participants by increasing mobility skills while also enhancing acceptance of new disability.<sup>13</sup> From the mental health perspective, Spornier *et al.* demonstrated that individuals participating in the National Veterans Wheelchair Games and National Disabled Veterans Winter Sports Clinic gained confidence due to the camaraderie and friendships they form with other participants.<sup>13</sup> Despite these known benefits, studies have yet to report on the demographic make-up or organizational characteristics within adaptive sports programs, both of which could impact U.S. military veteran participation in adaptive sports.

Based on the results of this survey, it appears that the majority of individuals participating in adaptive sports are veterans. The median program size within our study was 75 total participants per year, with a median of 50 veteran participants per organization. It is interesting to note, however, that 9% of programs surveyed did not have any veteran participants. Further assessment of these programs revealed that they were smaller programs and offered fewer sports (median number of participants = 15, average number of sports = 2). These programs may cater more to a specific sport than generalized adaptive sports programs.

The majority of programs (76%) had some degree of affiliation with a local VAMC. This suggests that



**Figure 3** Participation rates by age group.

although many programs are veteran-centric given their VAMC affiliation, there is a cohort of adaptive programs that provides adaptive sports services to individuals regardless of military background.

Similar to program affiliation, organizational status as independent vs. rehab center was split evenly amongst respondents, with 50% of organizations being independent programs and 50% being rehabilitation centers. However, there were vast differences when organizational status was stratified based on programs that were VAMCs; 95% of VAMC programs were rehabilitation centers compared to only 9% rehabilitation centers amongst non-VAMC community programs. It can be concluded that the programs that offer adaptive sports to veterans in the non-VAMC setting are independent programs without a rehabilitation center, while VA programs have rehabilitation centers associated with them. This finding represents an opportunity for future research to gain a better understanding of how adaptive sports organizations describe themselves.

In our evaluation of age-groups, it is evident that all ages participate in adaptive sports. However, there are a greater number of older participants. Given that the average age at which an enlisted soldier retired from the military due to injury or disability is 33 years old, it not surprising that the highest percentage of veteran participation was seen in the 35 and older age group.<sup>14</sup> Although future studies sub-dividing the 35 and older age group are warranted to better identify age-based trends in this population, another explanation for this finding is that older veterans may be

more likely to share similar experiences with each other, both from military and civilian life. The camaraderie developed with similar-aged individuals could be important to veterans when choosing adaptive sports programs. This concept is also supported by Sporer's study, in which participants found it easier to befriend and support fellow service members because they shared similar experiences.<sup>13</sup> Similarly, the experience-based sense of camaraderie can also explain the lower veteran participation rates seen among younger age groups. Veterans with disabilities are less likely to share common ground with children, adolescents, or young adults with disabilities, where the etiology of disability ranges from congenital musculoskeletal diseases to non-combat related trauma.

Further investigation of the age ranges within the programs in our study showed that only 16% of programs have participants ages 0–10, while 94% of programs have participants 35 and older (Fig. 3). One possible explanation for this finding could be access to transportation, which is a known barrier to participation.<sup>15,16</sup> Depending on severity of the disability, older individuals may be able to drive themselves to and from the programs, while younger participants are more likely to rely on others for their transportation. Along similar lines, distance from one's residence to a program site could also impact participation, as parents of younger individuals may not be willing to travel long distances for access to adaptive programs. Blauwet *et al.* demonstrated that participants in adaptive sports who lived within 5.3



miles and between 5.3 and 24.4 miles of the program site were respectively 3.8 and 2.8 times more likely to sustain participation compared to those who lived farther than 24.4 miles.<sup>1</sup> Further investigation into proximity of program location to a major transportation center is warranted in future studies.

The top ten most commonly offered sports were (1) golf, (2) hand cycling, (3) yoga, (4) kayaking, (5) cycling, (6) bowling, (7) fishing, (8) wheelchair basketball, (9) archery, (10) bocci. Broadly, these sports share several characteristics, including the ability to be played independently and the ability to play alongside an able-bodied individual. Golf, the most commonly offered sport, exhibits all of these characteristics. In addition, several golf courses, golf organizations, and equipment companies have discounts for active duty, reserves, retired military, and military veterans.<sup>17</sup> With the exception of wheelchair basketball, the remainder of the top-ten sports can be played alone and are logistically simple to organize. Team sports would be expected to require more organization and likely cost more due to their complexity. Additional studies specifically focusing on the reasons organizations offer specific sports would be useful so that adaptive sports programs could cater to the needs and desires of veterans.

In the evaluation of the contact level of sports offered by the adaptive programs in this study, it is evident that programs most commonly offer low-contact sports. This finding is not unexpected given that higher contact sports are more likely to require increased supervision, training, and risk, which may deter certain participants. The increased supervision and training required for the high-contact sports is also likely associated with higher organizational costs or fees, further limiting their offerings by adaptive sports programs.

Finally, we found that the majority of programs (82%) offer services year-round, with the remaining programs offering services only during certain seasons. This suggests that seasonal availability is unlikely to be a significant barrier to participation.

This study had several limitations, the first of which is a small sample size. In order to be included in the study, an organization had to be advertised in the resources section under “Sports and Recreational Organizations” on [https://www.sportsabilities.com/\[STATENAME\]](https://www.sportsabilities.com/[STATENAME]) or be otherwise known to the authors. Therefore, data from organizations not advertised or known was not captured in this study. Similarly, this method of organization identification was through a non-validated study instrument.

Another limitation was the lack of additional age subgroups in the 35 and older category. Most veterans would fall into the 35 and older group and thus it would be important in future studies to stratify this group to ascertain more robust data. However, given the lack of literature on this topic, we felt it important to publish these early results.

Beyond further investigation into the older age group, additional research could focus on the most commonly offered sports, and whether these are most popular amongst veterans or simply the most common sports offered. Other studies could investigate differences in the demographic make-up between those participating in individual vs. team sports. Such future work could shed light on programs that should be promoted, developed, and funded to increase veteran participation in order to allow veterans to enjoy the physical, psychosocial, and economic benefits associated with adaptive sports.

## Conclusion

Data from this prospective cross-sectional study suggests that U.S. Military veterans represent a large proportion of the individuals participating in adaptive sports. The majority of programs had some degree of affiliation with a VAMC. VAMC programs are more likely to be rehabilitation centers, whereas non-VAMC community organizations are most commonly independent organizations with no rehabilitation component. Individuals of all ages participate in adaptive sports, with increasing participation associated with increasing age. Golf was the sport offered most commonly by adaptive sports programs in this survey. Low-contact sports were offered more often than high-contact sports, and the majority of programs offered adaptive sports year-round.

## Disclaimer statements

**Contributors** None.

**Funding** No financial support was received for the work reported in this paper.

**Declaration of interest** Disabled U.S. military veterans are amongst those who benefit from adaptive sports, but little is known about the demographics and characteristics of these organizations.

**Conflicts of interest** The authors declare no conflict of interest.

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## Appendix

### Level of Contact Among Sports Studied:

High contact	Contact	Low contact
Goalball	Handcycling	Boccia
Ice Skating	Horseback Riding	Bowling
Judo	Rowing	Camping
Mountain Biking	Sailing	Canoeing
Nordic Skiing	Swimming	Curling
Power Soccer	Track and Field	Dragon Boating
Racquetball	Triathlon	Fishing
Rock Climbing	Wheelchair Racing	Flyfishing
Ropes Course	Wheelchair Softball	Golf
Sky Diving	Volleyball	Hiking
Sled Hockey		Kayaking
Snowboarding		Nordic Skiing
Wheelchair Basketball		Paddleboarding
Wheelchair Football		Pickleball
Wheelchair Rugby		Power lifting
Wheelchair Lacrosse		Rowing
Whitewater Rafting		Sailing
		Snow Shoeing
		Table Tennis
		Target Shooting
		Wheelchair Squash
		Wheelchair Tennis
		Yoga