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LEISURE PARTICIPATION AND LEISURE CONSTRAINTS OF INDIVIDUALS WITH LOWER LIMB AMPUTATIONS IN SOUTH AFRICA

Adri I. VISSER[1], Cindy KRIEL[1], Mariette SWANEPOEL[1] and Marike COCKERAN[2]

[1]*Physical Activity, Sport and Recreation Research Focus Area,* [2]*Medicine Usage in South Africa, Faculty of Health Sciences, North-West University, Potchefstroom, South Africa*

ABSTRACT

This study aimed to determine leisure participation and constraints experienced by individuals with lower limb amputation (LLA) in South Africa. A one-time, cross-sectional quantitative approach was used, incorporating the Trinity Amputation and Prosthesis Experience Scale–Revised (TAPES-R questionnaire) and the Constraints to Participation Questionnaire. These instruments were integrated into an electronic survey hosted on Google Forms. Fifty participants, with an average of 10 years since their amputation, were included in the study, with 62% having undergone below-knee LLA. Data were analysed using SPSS (version 27). Participants enjoyed a variety of recreational programme areas/activities: sport (52%), aquatics (14%), going to church (14%), adventure (8%) and social recreation (2%), and 10% did not report any recreational activity participation. The frequency of activity participation was high: 56% of participants reported engagement in recreational activities more than once a week or even daily, 16% participated moderately, 20% reported low participation and 8% gave no response. The Constraints to Participation Questionnaire showed overall low values for intrapersonal (1.89±0.38) and interpersonal (1.88±0.22) constraints and slightly higher values for structural constraints (2.22±0.46). Results indicated that individuals with LLA continued to engage in leisure activities by negotiating leisure constraints.

Keywords: Leisure; Leisure constraints; Lower limb amputation; Leisure participation; Recreation.

INTRODUCTION

It is said that "the quality of your leisure time isn't measured by the longevity of your activity, but by the meaning you give to it" (Brits, 2019). Allocating time for leisure activities is crucial for individuals, offering a range of benefits across multiple dimensions and yielding numerous positive outcomes (Brits, 2019). Researchers, policymakers and scholars have increasingly come to recognise the importance of leisure to an individual's well-being (Mansfield *et al*., 2020). Through participation in leisure activities, opportunities arise for making one's own choices, creating one's own identity, taking control of experiences, self-perception of abilities, a sense of self-worth, personal enrichment, and overall life experiences (Son *et al*., 2007; Edginton, 2012; Whiting & Hannam, 2015; Layland *et al*., 2018; Labbé *et al*., 2019).

Furthermore, participating in leisure and recreational activities often enables socialisation and sustainability of physical health (Fancourt *et al*., 2021). Various positive outcomes are associated with participating in leisure activities; however, individuals with lower limb amputation (LLA) may find it challenging to acquire these benefits as they face numerous constraints (physical, psychological, social and environmental) when participating in leisure (Batten *et al*., 2020).

Leisure is the time individuals have that does not include work obligations or life-sustaining responsibilities (McLean *et al*., 2008; Henderson, 2010; Leitner & Leitner, 2012). Leisure signifies an individual's freedom of choice that mainly contributes to personal needs for relaxation, self-enrichment, pleasure and reflection (Csikszentmihalyi, 1997; Majnemer *et al*., 2008; McLean *et al*., 2008; Kelly, 2019). Recreation and play are generally associated with leisure (O'Sullivan, 2013). Recreation, however, is described as activities that individuals choose to participate in and enjoy during their free time (Hurd & Anderson, 2010; Stumbo & Peterson, 2021; Armağan & Temel, 2022). When participating in recreation, individuals can aim to achieve their personal goals, have positive leisure experiences, renew their spirits, rejuvenate, and restore their energy (Priest & Gass, 2005; McLean *et al*., 2008; Stumbo & Peterson, 2021; Armağan, & Temel, 2022). Recreational activities can be delineated into 14 distinct programme areas based on their nature: adventure, aquatics, dance, drama, fine arts, crafts, music, hobbies, outdoor activities, literature, social recreation, sports, travel, and volunteer services (Russell & Jamieson, 2008).

Benefits that individuals can experience through leisure and recreation participation include psychological benefits (emotional and psychological health), physical benefits (preventing hypertension; increased muscular strength and cardiorespiratory benefits), and social benefits (relationships are strengthened) (Russell & Jamieson, 2008; Henwood *et al*., 2012; Li *et al*., 2021; Stumbo & Peterson, 2021). However, individuals with an amputation continually experience a plethora of constraints that restrict them from having an active leisure lifestyle and are unable to experience the benefits associated with leisure and recreation (Wadey & Day, 2018).

According to LLA literature and a study conducted in South Africa (SA), engagement in leisure and recreational activities is the most reduced element of life among people living with LLA (Ennion & Yu, 2019; Spahn *et al*., 2019). According to Esquenazi and Yoo (2021), LLA is the surgical removal of all or part of the lower limb. Constraints that individuals with LLA might experience include a decrease in physical functioning and activity limitations/restrictions (Spahn *et al*., 2019). Leisure constraints are widely accepted and categorised into three categories: intrapersonal, interpersonal and structural (Crawford *et al*., 1991; Hawkins *et al*., 1999; Jackson, 2000; Godbey, 2008; McLean *et al*., 2008). Intrapersonal constraints are components that influence an individual's fondness for an activity and attraction thereof (being skilled in an activity and enjoying the activity) (Crawford *et al*., 1991; Jackson *et al*., 1993; Jackson, 2000; Godbey, 2008; McLean *et al*., 2008). Interpersonal constraints occur when interacting with family members, friends and co-workers or can even refer to lacking such interaction opportunities (Crawford *et al*., 1991; Jackson *et al*., 1993; Jackson, 2000; Godbey, 2008; McLean *et al*., 2008). Structural constraints consist of an individual's outer surroundings; a lack of opportunities, the cost of activities and accessibility are examples of constraints that hinder leisure participation (Crawford *et al*., 1991; Jackson *et al*., 1993; Jackson, 2000;

Godbey, 2008; McLean *et al*., 2008). According to Wing (2017), information about participation in leisure activities after an LLA in the SA context is scarce, highlighting the need for research on the leisure constraints that individuals with LLA experience.

Leisure constraints can be reduced and addressed by finding and incorporating various strategies (ways to integrate individuals with disabilities) to ensure that leisure goals can be achieved, regardless of whether one has a physical disability (Jackson, 1999; Lyu *et al*., 2013). Limited information about the constraints that individuals experience after an LLA is available for the SA population (Godlwana & Stewart, 2013). Therefore, the research question to be answered was: What are the leisure participation and leisure constraints of individuals with LLA in SA?

PURPOSE OF THE RESEARCH

The aim of this study was to establish the leisure activities that individuals with LLA participate in and identify whether they experience leisure constraints. The study was based on the following hypotheses: There will be a negative correlation between leisure participation and structural constraints, and a positive correlation between leisure participation and intrapersonal constraints of individuals with LLA in SA.

METHODOLOGY

Research design

A once-off, cross-sectional study design was used, collecting quantitative data, expressed as means and frequencies, from an available sample. Data collection was conducted via an online survey.

Participants and procedures

The sample consisted of 50 participants (34 males, 15 females, and 1 participant who preferred not to say). A power calculation indicated a minimum of 42 participants to ensure 80% power. The *inclusion criteria* stipulated that participants (of any race and gender) had to have had their amputation for more than 18 months, be 18 years and older, have access to the internet and email, and be able to read and understand English. Participants who were pregnant at the time of data collection and/or had other disabilities or injuries apart from their LLA were excluded from participating in the study. Thirty-four percent (n=17) of participants had an above-knee amputation, 62% (n=31) had a below-knee amputation, and 4% (n=2) indicated a different/other type of amputation (such as a bilateral amputation). Fifty-two percent of participants reported having an amputation owing to accident-related incidents (n=26), 4% owing to cancer (n=2), 10% owing to diabetes (n=5), 6% because of peripheral vascular disease (n=3), and 28% for other reasons such as interpersonal violence, pressure sores, congenital deformities, blood clots, infections, sports injury, septicaemia, and fibular hemimelia (n=14).

The research team comprised four members: the first author, an independent researcher, and two mediators. The researcher contacted potential mediators in the private and public sectors to obtain their assistance in identifying participants for the study. The mediators posted the survey link on their social media platforms and emailed former patients to invite them to participate in the online survey via Google Forms. The independent researcher corresponded

with the mediators, answered questions asked by participants (via email), and extracted the data from Google Forms. The data were then sent to the statistical analyst from the NWU Centre of Statistical Consultation, who was also consulted during the statistical calculations of the study. Detailed information about informed consent and protecting participant confidentiality appeared on the survey's cover page. Informed consent was obtained when the participants clicked on the box to continue to the next section of the survey. The survey was available for 2 months and 46 surveys were collected. Thereafter, snowball sampling was conducted, and four additional surveys were added. A total of 50 surveys were collected.

Questionnaires

Two unaltered questionnaires were employed, administered via a single online survey using Google Forms: the Trinity Amputation and Prosthesis Experience Scale–Revised questionnaire (TAPES-R) comprising questions 1–16, followed by the Constraints to Participation Questionnaire comprising questions 17–57.

TAPES-R questionnaire

The TAPES-R questionnaire is a multidimensional assessment tool used to measure an individual's adaptation to amputation and prosthesis. The questionnaire included a section to gather demographic information, after which the three subscales, namely *psychosocial adjustment* (general adjustments, social adjustment and adjustment to limitation), *activity restriction*, and *satisfaction with the prosthetic device* (aesthetic satisfaction and functional satisfaction), followed.

Scoring of the TAPES-R questionnaire

The scoring of the questionnaire was calculated as specified by the manual, which indicated that the values corresponding to the questions of each subscale should be added together and then divided by the number of questions. High scores indicated that participants had adjusted to their prosthesis/amputation. There are no norms for the TAPES-R questionnaire; however, the World Health Organization (WHO, 2011) indicated that they are developing norms.

Constraints to Participation Questionnaire

It is important to note that this questionnaire was specifically designed for individuals with physical and mental disabilities and should, therefore, not be confused with other questionnaires generally used to determine constraints to participation in general population groups. This questionnaire gathered data on the type of activities participants participated in, how often they participated (frequency), and if they experienced any leisure constraints. In addition to the 14 identified recreation programme areas, suggested by Russell and Jamieson (2008), "going to church" as a leisure activity was added in a study by Creighton-Smith *et al.* (2017). The reliability of the questionnaire was established using Cronbach alpha values with the following results: community α=0.92, time α=0.84, equipment α=0.87, economic α=0.90, intrapersonal α=0.81, transport α=0.80 and interpersonal α=0.84, as indicated by Darcy *et al.* (2017).

The items of the Constraints to Participation Questionnaire were originally divided into seven sections (community, economics, equipment, intrapersonal, interpersonal, transport and time). For this study, questions were categorised into the three leisure constraints (intrapersonal,

interpersonal and structural constraints) suggested by Crawford *et al*. (1991), to be compared with other studies. They were answered using a six-point Likert scale.

Scoring of the Constraints to Participation Questionnaire

Open-ended questions were used to identify the recreation programme areas/activities in which participants took part during their leisure time, measured by different Likert scales, and included descriptive statistics (Darcy *et al*. 2017). Each constraint's questions had a six-point Likert scale and mean scores and standard deviations were reported for each construct/subscale. This questionnaire had not been used in an SA context before; therefore, permission to use it was obtained from the author of the questionnaire.

Statistical analysis

The statistical analysis was performed using SPSS (version 27), which consisted of descriptive statistics for each construct, scale and subscale. The activities of the leisure participation questionnaire were categorised according to Russell and Jamieson's (2008) 14 recreation areas (aquatics, adventure, sport, drama, dance, fine arts, hobbies, crafts, music, outdoor activities, literature, travel, social recreation and volunteer services). Additionally, "going to church" was added as a recreation programme area, similar to the study by Creighton-Smith *et al*. (2017).

Ethical considerations

Ethical approval was obtained from the North-West University (NWU) Ethics Committee at the Faculty of Health Sciences (HREC; reference: NWU-00937-19-A1).

RESULTS

Table 1 represents the TAPES-R questionnaire and reports on the demographic information, as well as residual limb pain. The majority of participants were male (68%), with a mean age of 46.22 (±11.63) years and a mean body mass index (BMI) value of 28.76 (±5.82) kg/m^2, classifying them as being overweight (WHO, 2020). Participants had had their amputation for approximately 10 years, had worn a prosthetic device for about 9 years, and had their current prosthesis for about 1 year and 8 months.

Fifty-two percent of participants (n=26) did not experience any residual (limb) pain. The remaining 48% of participants (n=24) were asked how often they had experienced stump pain during the last week. Two per cent of participants (n=1) stated that they did not count the number of times they experience stump pain, and 4% (n=2) mentioned that although they do experience pain occasionally, they did not experience pain during the last week. Twenty-four per cent of the participants (n=12) reported having pain between one and seven times per week, and 18% (n=9) experienced stump pain daily. Participants were asked to rate their pain on a scale from 1 to 5 (1=Discomforting, 2=Mild, 3=Distressing, 4=Horrible, 5=Excruciating). Sixteen per cent (n=8) described the pain as *discomforting*, 14% (n=7) as *mild*, 10% (n=5) as *distressing*, 6% (n=3) as *horrible* and 2% (n=1) as *excruciating*. Furthermore, 14% (n=7) mentioned that the pain interfered with their normal lifestyle (work, social and family activities) *a little bit*, and 10% (n=5) indicated that it influenced their life *quite a bit*. Experiencing residual (limb) pain is a condition that occurs in about half of individuals who have had an amputation

and is described as a type of pain that occurs in the part of the limb that remains after amputation (Burden *et al.*, 2018).

Table 1. **DEMOGRAPHIC AND PROSTHETIC-RELATED INFORMATION OF INDIVIDUALS WITH LOWER LIMB AMPUTATION**

Characteristics of participants	**N**	**Mean (±SD)**
Gender		M=68%, F=30%, P=2%
Age (years)	49	46.22 (±11.63)
BMI (kg/m^2)	34	28.76 (±5.82)
Prosthesis related information		
How long they have had their amputation (months)	50	120.88 (120.18) (±10 y)
How long they have had a prosthesis (months)	50	109.90 (128.81) (±9 y)
How long they had the prosthesis they wear now (months)	50	22.83 (14.74) (±1 y 8 m)
Residual limb pain		**n (%)**
Do you experience residual limb (stump) pain?		
Yes		24 (48)
No		26 (52)
During the last week, how many times have you experienced stump pain?		
Respondents not reporting		26 (52)
Don't count		1 (2)
None		2 (4)
1–7 times a week		12 (24)
Everyday		9 (18)
Average level of limb (stump) pain experienced during that week		
Respondents not reporting		26 (52)
Discomforting		8 (16)
Mild		7 (14)
Distressing		5 (10)
Horrible		3 (6)
Excruciating		1 (2)
How much limb (stump) pain interfered with their routine lifestyle (work, social and family activities) during that week		
Respondents not reporting		24 (52)
Not at all		4 (8)
A little bit		7 (14)
Moderately		6 (12)
Quite a bit		5 (10)
A lot		2 (4)

N=Sample size SD=Standard deviation F=Female M=Male P=Prefer not to say BMI=Body mass index

Table 2 indicates how well participants adjusted to their amputation and their experience living with a prosthetic device (scales derived from the *TAPES-R* questionnaire). The first scale measured participants' *psychological adjustment*, their satisfaction with the prosthesis, and the *activity restriction scale*.

Table 2. **TAPES-R QUESTIONNAIRE PROSTHETIC EXPERIENCE SCALE**

Variables	**N**	**Mean (±SD)**
Psychosocial adjustment subscales (1=Strongly disagree, 2=Disagree, 3=Agree, 4=Strongly agree)		
General adjustment	50	3.42 (±0.52)
Social adjustment	50	3.49 (±0.61)
Adjustments to limitations	50	2.31 (±0.92)
Satisfaction with prosthesis subscales (1=Not satisfied, 2=Satisfied, 3=Very satisfied)		
Aesthetic satisfaction	50	2.42 (±0.57)
Functional satisfaction	50	2.31 (±0.55)
Activity restriction subscale (0=No, not at all, 1=Limited a little, 2=Yes, limited a lot)		
	50	0.78 (±0.53)

Activity restriction subscale items, n (%)	**N**	**0**	**1**	**2**
Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	50	6 (12)	22 (44)	22 (44)
Climbing several flights of stairs	50	17 (34)	15 (30)	18 (36)
Running for a bus	50	41 (82)	8 (16)	1 (2)
Sport and recreation	50	10 (20)	22 (44)	18 (36)
Climbing one flight of stairs	50	26 (52)	13 (26)	11 (22)
Walking more than a kilometre	50	26 (52)	14 (28)	10 (20)
Walking half a kilometre	49	32 (65.3)	12 (24.5)	5 (10.2)
Walking 100 metres	50	41 (82)	8 (16)	1 (2)
Working on hobbies	50	31 (62)	13 (26)	5 (12)
Going to work	50	38 (76)	7 (14)	5 (10)

N=Sample size SD=Standard deviation
General adjustment=Adjustment, acceptance, etc., of prosthesis **S**ocial adjustment=Wearing of prosthesis, being open about prosthesis Adjustments to limitations=Work, dependence, and limitations
Activity restriction=Walking, running and stairs Aesthetic satisfaction=Colour, shape, and appearance of the prosthesis Functional satisfaction=Weight, usefulness, reliability, fit and comfort of prosthesis.

The *psychological adjustment* scale had three subscales: general adjustment, social adjustment and *adjustment to limitations*. *General adjustment* dealt with "acceptance and adjustment to the prosthesis". The mean value of the group for this subscale was 3.42 (±0.52), suggesting that participants mostly *agreed* that they had adapted to prostheses in *general*. For *social adjustment*, which refers to "being open about the prosthesis and the wearing of a prosthesis", the group had a mean value of 3.49 (±0.61), illustrating that participants *agreed* that they had

adjusted on a social level. *Adjustment to limitations* refers to "dependence, limitations and work", which reported a value of 2.31 (±0.92), implying that participants *disagreed* with adjusting to their limitations.

The *satisfaction with the prosthesis* scale had two subscales: aesthetic and functional. *Aesthetic satisfaction* refers to the "appearance, the shape and colour of the prosthetic prosthesis". The mean value of the cohort for this subscale was 2.42 (±0.57), illustrating that the participants were satisfied with the *aesthetics* of their prosthesis. The second subscale, *functional satisfaction*, refers to the *comfort, usefulness, weight, reliability and fit of the prosthesis*. The mean value of the cohort for this subscale was 2.31 (±0.55), revealing that the participants were *very satisfied* with the *functioning* of their prostheses.

The *activity restriction scale* included several physical activities that could hinder participation in activities (Table 2). For this scale, the cohort had a mean value of 0.78 (±0.53), meaning that participants indicated that they experienced "a little bit more" dissatisfaction and restrictions in this scale when compared with the other scales. Activities they found "a bit more" challenging included physical activities (i.e., *walking, running, and climbing stairs)*, with a mean value of 0.78 (±0.53), showing that the participants *were not satisfied*. They further demonstrated that they struggled with vigorous activities such as running, lifting heavy objects and strenuous sports (44%), and climbing several flights of stairs (36%), in which they were *limited a lot*. Likewise, in sport and recreation activities, 36% of the participants were also *limited a lot*.

Moreover, the participants showed that they "agreed" to have made the psychosocial adjustment to their amputations (general adjustment with a mean of 3.42 [±0.52], social adjustment 3.49 [±0.61] and adjustments to limitations with a mean value of 2.31 (±0.92). Participants were also "satisfied" with their prosthesis (aesthetic satisfaction with a mean value of 2.42 [±0.57] and functional satisfaction 2.31 [±0.55]).

Table 3 represents the *Constraints to Participation Questionnaire*. This questionnaire explored the main recreational activities participants chose to participate in and the frequency of their participation. The categorisation of frequencies included low participation frequency (no participation and once per month), moderate participation frequency (participation more than once per month and once per week) and high participation frequency (more than once per week or every day). Only 10% of the participants indicated that they did not participate in any recreational activity. This cohort's most popular recreational activity was sport (52%, n=26), followed by aquatics (14%, n=7), attending church (14%, n=7), adventure (8%, n=4) and social (2%, n=1). The frequency of participation in the activities was high, with 56% (n=26) of the participants reporting engaging in recreational activities more than once a week or daily, 16% (n=8) participating moderately, 20% (n=10) reporting low participation and 8% (n=4) not responding to this question.

***Table 3*. CONSTRAINTS TO PARTICIPATION QUESTIONNAIRE – RECREATIONAL ACTIVITIES**

Recreation area (N=50)	**n (%)**
No response	5 (10)
Adventure	4 (8)
Aquatics	7 (14)
Church	7 (14)
Social	1 (2)
Sport	26 (52)
Frequency of participation (N=50)	
No response	4 (8)
Low	10 (20)
Moderate	8 (16)
High	8 (16)

Tables 4–6 present the *Constraints to Participation Questionnaire*. This questionnaire explored the leisure constraints experienced by individuals living with LLAs. Table 4 summarises the intrapersonal constraints, Table 5 summarises the interpersonal constraints, and Table 6 summarises the structural constraints. The *Constraints to Participation Questionnaire* indicated low mean scores for intrapersonal constraints (1.89±0.38) and interpersonal constraints (1.8 ±0.22), with the most constraints reported for structural, with a mean value of 2.22 (±0.46).

Table 4 displays the *intrapersonal constraints* experienced by participants. Sixteen per cent of the participants indicated they *always* experience a "fear of public transportation", and 26% specified that they *often* have "too many responsibilities". However, a "lack of information" regarding available leisure activities is experienced *often* (26%) and *most of the time* (10%). These results portrayed that participants from this cohort did not experience *intrapersonal constraints* frequently, with a mean value of 1.89 (±0.38), "a little".

Table 5 illustrates the *interpersonal constraints* of participants and shows that 8% of participants implied that they *always* had "no support to participate", 10% reported that they *often* had "no friends to participate with", and 8% of the group "did not wish to participate alone". Moreover, the participants stipulated that they only *sometimes* had a "lack of companions" (18%) and a "lack of skills" (20%). Interpersonal constraint had a mean value of 1.88 (±0.22).

Table 6 indicates the *structural constraints* experienced by this group. Twenty-four per cent of participants reported a "lack of government support", 16% stipulated that "adaptable equipment is too expensive", and 16% claimed that "pricing was too expensive" *most of the time*. The cohort's higher mean value of 2.22 (±0.46) for *structural constraints* illustrated that participants generally experienced more structural constraints than the other constraint areas.

Table 4. **CONSTRAINTS TO PARTICIPATION QUESTIONNAIRE – INTRAPERSONAL CONSTRAINTS**

Items (n=12)	Frequencies, n (%) (N=50)						Constraint grouping and top rankings			
							Low ranking (1–3)		High ranking (4–6)	
	1 Never	2 A little	3 Sometimes	4 Often	5 Most of the time	6 Always	%	Rank	%	Rank
Fear of public transportation	16 (32)	14 (28)	6 (12)	3 (6)	3 (6)	8 (16)	72	6	28	4
I do other activities within my leisure time	14 (28)	8 (16)	13 (26)	10 (20)	4 (8)	1 (2)	70	7	30	3
Fear of violence	28 (56)	8 (16)	7 (14)	4 (8)	2 (4)	1 (2)	86	5	14	5
Lack of safety	24 (48)	9 (18)	13 (26)	3 (6)	0 (0)	1 (2)	92	4	8	6
Lack of interest in group activities	28 (56)	5 (10)	13 (26)	2 (4)	2 (4)	0 (0)	92	4	8	6
Not accustomed to sports and recreation	27 (54)	8 (16)	11 (22)	0 (0)	4 (8)	0 (0)	92	4	8	6
Sport and recreation are not important to me	35 (70)	3 (6)	9 (18)	3 (6)	0 (0)	0 (0)	94	3	6	7
Overcrowding	26 (52)	8 (16)	15 (30)	1 (2)	0 (0)	0 (0)	98	2	2	8
Poor health	34 (68)	6 (12)	10 (20)	0 (0)	0 (0)	0 (0)	100	1	0	9
Feelings of guilt	38 (76)	6 (12)	6 (12)	0 (0)	0 (0)	0 (0)	100	1	0	9
Too many responsibilities	17 (34)	0 (0)	17 (34)	13 (26)	2 (4)	1 (2)	68	8	32	2
Lack of information	11 (22)	2 (4)	17 (34)	13 (26)	5 (10)	2 (4)	60	9	40	1
						Average percentage, %	85		15	
Intrapersonal constraints	**Mean**		**SD**			**Maximum**			**Minimum**	
	1.89		±0.38			1.36			2.7	

***Table 5*. CONSTRAINTS TO PARTICIPATION QUESTIONNAIRE – INTERPERSONAL CONSTRAINTS**

Items (n=6)	Frequencies, n (%) (N=50)						Constraint grouping and top rankings			
							Low ranking (1–3)		High ranking (4–6)	
	1 Never	2 A little	3 Sometimes	4 Often	5 Most of the time	6 Always	%	Rank	%	Rank
No support to participate	26 (52)	9 (18)	7 (14)	3 (6)	1 (2)	4 (8)	84	5	16	2
No friends to participate with	26 (52)	9 (18)	6 (12)	5 (10)	2 (4)	2 (4)	82	6	18	1
Lack of companions	28 (56)	8 (16)	9 (18)	1 (2)	2 (4)	2 (4)	90	3	10	4
Not wishing to participate alone	30 (60)	8 (16)	6 (12)	4 (8)	2 (4)	0 (0)	88	4	12	3
The behaviour of others in public towards me	35 (70)	6 (12)	6 (12)	2 (4)	1 (2)	0 (0)	94	2	6	5
Lack of skills	27 (54)	11 (22)	10 (20)	2 (4)	0 (0)	0 (0)	96	1	4	6
						Average percentage, %	89		11	
Interpersonal constraints	**Mean**		**SD**		**Minimum**		**Maximum**			
	1.88		±0.22		1.56		2.12			

Table 6. **CONSTRAINTS TO PARTICIPATION QUESTIONNAIRE – STRUCTURAL CONSTRAINTS**

Items (n=29)	Frequencies, n (%) (N=50)						Constraint grouping and top rankings			
							Low ranking (1–3)		High ranking (4–6)	
	1 Never	2 A little	3 Sometimes	4 Often	5 Most of the time	6 Always	%	Rank	%	Rank
Adaptable equipment is too expensive	16 (32)	14 (28)	6 (12)	3 (6)	3 (6)	8 (16)	72	13	28	4
Lack of government support	14 (28)	7 (14)	8 (16)	3 (6)	6 (12)	12 (24)	58	16	42	1
No access to facilities close to home/work	18 (36)	9 (18)	9 (18)	4 (8)	3 (6)	7 (14)	72	13	28	4
Scarcity of places	21 (42)	8 (16)	10 (20)	5 (10)	0 (0)	6 (12)	78	11	22	6
Lack of money	13 (26)	6 (12)	13 (26)	8 (16)	7 (14)	3 (6)	64	15	36	2
Pricing – too expensive	19 (38)	10 (20)	10 (20)	0 (0)	8 (16)	3 (6)	78	11	22	6
No integrated sports and recreation programmes are available	19 (38)	9 (18)	10 (20)	3 (6)	6 (12)	3 (6)	76	12	24	5
Scarce access to adaptable equipment	20 (40)	9 (18)	9 (18)	4 (8)	5 (10)	3 (6)	76	12	24	5
Opportunities to be far from home	21 (42)	8 (16)	10 (20)	4 (8)	4 (8)	3 (6)	78	11	22	6
Sport and recreation staff don't include individuals with disabilities	22 (44)	10 (20)	9 (18)	3 (6)	3 (6)	3 (6)	82	9	18	8
Lack of accessible public transport	26 (52)	6 (12)	8 (16)	5 (10)	2 (4)	3 (6)	80	10	20	7
Unequal access to facilities	19 (38)	13 (26)	7 (14)	7 (14)	1 (2)	3 (6)	70	14	30	3
Lack of private transportation	29 (58)	4 (8)	12 (24)	2 (4)	0 (0)	3 (6)	90	5	10	12
Lack of personal income	20 (40)	8 (16)	13 (26)	2 (4)	5 (10)	2 (4)	82	9	18	8
No access to accessible facilities	25 (50)	13 (26)	5 (10)	3 (6)	2 (4)	2 (4)	86	7	14	10
No assessment of the needs of individuals with disabilities	23 (46)	9 (18)	10 (20)	4 (8)	3 (6)	1 (2)	84	8	16	9

***Table 6*. CONSTRAINTS TO PARTICIPATION QUESTIONNAIRE – STRUCTURAL CONSTRAINTS (*cont.*)**

Work commitments	20 (40)	7 (14)	14 (28)	6 (12)	2 (4)	1 (2)	82	9	18	8
Only segregated sports and recreation programmes are available	24 (48)	12 (24)	7 (14)	5 (10)	2 (4)	0 (0)	86	7	14	10
Restrictions for individuals with disabilities in public	23 (46)	8 (16)	7 (14)	9 (18)	3 (6)	0 (0)	76	12	24	5
Hygiene and cleanliness issues	25 (50)	8 (16)	13 (26)	2 (4)	2 (4)	0 (0)	92	4	8	13
Lack of time	17 (34)	11 (22)	19 (38)	1 (2)	2 (4)	0 (0)	94	3	6	14
Lack of access to accessible toilets and change rooms	21 (42)	11 (22)	12 (24)	5 (10)	1 (2)	0 (0)	88	6	12	11
Permission needed to participate	37 (74)	4 (8)	8 (16)	0 (0)	1 (2)	0 (0)	98	1	2	15
No adaptable equipment to use	22 (44)	11 (22)	14 (28)	2 (4)	1 (2)	0 (0)	94	3	6	14
Too many domestic duties to do	23 (46)	6 (12)	13 (26)	8 (16)	0 (0)	0 (0)	84	8	16	9
Low quality/boring choice of opportunities	24 (48)	5 (10)	15 (30)	2 (4)	1 (2)	3 (6)	88	6	12	11
Sport and recreation only for men	40 (80)	2 (4)	6 (12)	2 (4)	0 (0)	0 (0)	96	2	4	14
Integration of sexes not allowed	43 (86)	0 (0)	6 (12)	1 (2)	0 (0)	0 (0)	98	1	2	15
Poor health of family member	6 (12)	0 (0)	38 (76)	5 (10)	1 (2)	0 (0)	88	6	12	11

			Average percentage, %	**82**	**18**
Structural constraints	**Mean**	**SD**	**Minimum**	**Maximum**	
	2.22	0.46	1.30	3.32	

DISCUSSION

The aim of this study was to investigate the type of leisure activities individuals with LLA participate in and to explore the leisure constraints they experience. It was clear that the participants enjoyed various recreational activities, including sports, aquatics, attending church, adventure, and social activities (Table 3). Participants also indicated a high frequency of participation in leisure activities (Table 3). Furthermore, participants reported low values when investigating the leisure constraints they experienced (Tables 4–6). A possible explanation for these findings is that individuals from this cohort had adjusted to their amputation as they had had it for more than 10 years (Table 1). Another explanation could be that they had accepted their amputation and were satisfied with their prosthesis (Table 2) (Matos *et al.,* 2020). Furthermore, the participants might have dealt with their constraints, and their intrapersonal and interpersonal needs could have changed over time (Wadey & Day, 2018). The findings of this study were the opposite of other studies that investigated the leisure constraints experienced by individuals with LLA. Ehde *et al.* (2000); Kars *et al.* (2009); Couture *et al.* (2010); Gallagher *et al.* (2011); Bragaru *et al.* (2011); and Wadey and Day (2018) state that individuals with LLA experience various leisure constraints including intrapersonal (affects, residual limb pain), interpersonal (attitudes of others) and structural (architecture and transportation) constraints. Although 52% of participants did not experience residual (limb) pain, a high percentage (48%) (n=24) of the cohort did, with 24% (n=12) of the group experiencing it between one and seven times per week (Table 1). Sixteen per cent described the pain as *discomforting*, 14% (n=7) as *mild,* 10% (n=5) as *distressing*, 6% (n=3) as *horrible* and 2% (n=1) as *excruciating*.

The activities in which this cohort participated were also mentioned in the systematic review of Bragaru *et al.* (2011), suggesting that the interests of individuals with LLA could have been the same as those they might have participated in before amputation (Kars *et al.*, 2009). It could also be that these activities are mostly available for participation, easily accessed and require limited equipment (Magi, 1999). The most frequent programme area that the participants participated in was sport (Table 3). Possible explanations for this finding could be that participation in sports was mainly associated with the health benefits that sports offer, or that participants might have participated in a sport before their amputation and/or even that sports facilities were more readily available (Magi, 1999; Kars *et al.*, 2009; Bragaru *et al.*, 2011; Wadey & Day, 2018).

Another factor investigated in our study was whether individuals with LLA had adapted to their amputation. This is important as adaptation to an amputation could directly influence the leisure constraints that individuals with LLA may or may not experience (Ehde *et al.*, 2000). With the TAPES-R questionnaire, we could determine that this cohort adjusted quite well (Table 2) to their amputations in terms of *psychosocial adjustment* (general adjustment, social adjustment and adjustment to limitations) and *satisfaction with the prosthesis* (aesthetic satisfaction and functional satisfaction). An explanation for this could be that the individuals in our study had had enough time to adjust to their amputation, having had their amputation for approximately 10 years (Table 1). The TAPES-R questionnaire included the following subscales: psychosocial adjustment, satisfaction with a prosthesis and activity restriction. The psychosocial adjustment subscale values were *general adjustment* 3.42 (±0.52), *social adjustment*s 3.49 (±0.61) and *adjustment to limitations* 2.31 (±0.92). These scores were consistent with the scores of Matos

et al. (2020), who also used the TAPES-R questionnaire and had similar results. The study by Matos *et al*. (2020) had 49 participants from Brazil with a similar inclusion criterion (aged over 18 years, had an LLA for more than 6 months, and had good literacy), the results of which also suggested that individuals who had their amputation for longer (over 10 years) showed better limitation adjustments.

The results of the activity restriction scale of the TAPES-R questionnaire (Table 2) determined that the cohort did not wholly adjust to their activity restrictions. This study's activity restriction scale average was 0.78 (±0.53) and aligned with the results of Yari *et al*. (2008). In the study by Yari *et al*. (2008), high scores in activities such as running, lifting heavy objects, participating in strenuous sports, climbing several flights of stairs, and participating in sports and recreation were reported. This could demonstrate that individuals with LLA choose to participate in leisure activities that are not physically exhausting. Moreover, the mean age of this study's participants was 46.22 (±11.63) years, which could have contributed to activity restriction, along with the participants' BMI of 28.76 (±5.82) kg/m^2 (Table 1), which classified them as being overweight (WHO, 2020).

The leisure constraints experienced by individuals with LLA in our study were in contrast to other studies (Gallagher *et al*., 2011; Wadey & Day, 2018; Batten *et al*., 2020). Participants in our study did not experience many intrapersonal, interpersonal or structural constraints (Tables 4–6), which could possibly be attributed to constraint negotiation. Constraint negotiation is the interaction between constraints and the individual to overcome those constraints (Jackson *et al*., 1993). Constraint negotiation, as suggested by Jackson *et al*. (1993), is supported by the findings of Lyu *et al*. (2013), wherein the desire to participate in the activity leads to modified participation.

In this cohort, *intrapersonal* and *interpersonal constraints* (Tables 4 & 5) showed low values. "Fear of public transportation" (16%) was emphasised within intrapersonal constraints. It is not uncommon for individuals with LLA to experience numerous psychological constraints, such as fear (Batten *et al*., 2020). Within *interpersonal constraints*, the following items were emphasised: no support to participate (8%), no friends to participate with (4%) and lack of companions (4%). These findings correlate with those of Pinello (2020), who found that individuals with LLA experience frequent interpersonal constraints. Batten *et al*. (2020) also mentioned that individuals with LLA often experience various social constraints, which supports our findings.

Lastly, regarding *structural constraints*, as mentioned before, the cohort did not experience many constraints. Still, some individuals did specify that they always experienced the following structural constraints: "lack of government support" (24%) and "adaptable equipment too expensive" (16%). These constraints were also identified in the study of Katz *et al*. (2009). This may be attributed to poverty, widely acknowledged as one of SA's most serious problems (Budlender, 1999). Our results demonstrate that individuals with LLA experience more *structural* than *intrapersonal* and *interpersonal* constraints, even though the values were low (Table 6). Crawford (1991) suggested that constraints occur in a hierarchy in which an individual first experiences intrapersonal, interpersonal and then structural constraints. Thus, the participants may have not yet reached the structural level of constraints but have negotiated the intrapersonal and interpersonal constraints. Additionally, the participants indicated that they

used a prosthetic device, suggesting that the use of a prosthetic device contributes to leisure participation and might also explain why they experienced low leisure constraints. This statement is supported by the findings of Klute *et al*. (2006), who mentioned that selecting specific prosthetic devices can significantly positively influence an individual's ability to achieve their recreational goals.

Another factor that can influence leisure participation, or the lack thereof, is residual limb (stump) pain. Residual limb (stump) pain is described as disabling painful sensations that individuals with LLA commonly experience after a limb amputation (Münger *et al*., 2020). In this cohort, 48% experienced residual limb (stump) pain (Table 1). A study conducted by Burden *et al*. (2018), which included participants with LLA from various parts of the world (Australia n=10, Canada n=2, United States n=57, United Kingdom n=12, and SA n=1), reported that 68% of participants experienced residual limb (stump) pain. Thus, this condition should not be taken lightly, as an individual would not want to participate in or be interested in leisure activities when residual limb (stump) pain is experienced.

CONCLUSION

Recreational activity participation in our cohort was high, with most engaging in sports, aquatics, church attendance and adventure activities. Despite high participation frequencies, constraints were still present, particularly structural constraints, which included a lack of government support and the high cost of adaptable equipment. Intrapersonal and interpersonal constraints were less frequently experienced, but factors such as fear of public transportation, responsibilities and lack of information about available leisure activities were notable. Knowing which recreational activities individuals with LLA choose to participate in allows recreational therapists to incorporate them in their programming. Although leisure constraints were low in our cohort, leisure education can enhance opportunities for participation.

RECOMMENDATIONS

Future studies could determine the activities individuals with LLA participated in before their amputation and if these activities changed after LLA. This could indicate how individuals have had to adapt to their leisure and if a professional (such as a therapeutic recreational therapist) could assist.

Identifying leisure constraints could be beneficial in determining the point at which individuals start to negotiate their leisure constraints within their rehabilitation process. At that point, leisure education could be beneficial, a gap that a therapeutic recreational therapist could fill. *Structural constraints* such as a "lack of government support" (16%), "adaptable equipment is too expensive" (16%) and "pricing was too expensive" *most of the time* were identified. A future study could determine if the socioeconomic status of individuals with LLA determines these constraints. Using the TAPES-R questionnaire, we found that 48% of the participants in this study experienced residual limb (stump) pain with a low intensity. Other studies could explore if participation in recreational activities is influenced by residual limb (stump) pain.

Lastly, we suggest that people with other types of physical disability should also be investigated in a similar study, as each type of disability may determine the different leisure activities, frequency of participation, and leisure constraints these individuals may experience.

Conflict of interest

The authors report no conflict of interest.

REFERENCES

ARMAĞAN, E. & TEMEL, E. (2022). Flow experience in tourism activities. In G. Akel, *Handbook of research on interdisciplinary reflections of contemporary experiential marketing practices.* (pp. 166-200). Hershey, PA: IGI Global.

BATTEN, H.; LAMONT, R.; KUYS, S.; MCPHAIL, S. & MANDRUSIAK, A. (2020). What are the barriers and enablers that people with a lower limb amputation experience when walking in the community? *Disability and Rehabilitation*, 42(24): 3481-3487. https://doi.org/10.1080/09638288.2019.1597177

BRAGARU, M.; DEKKER, R.; GEERTZEN, J.H. & DIJKSTRA, P.U. (2011). Amputees and sports: A systematic review. *Sports Medicine*, 41(9): 721-740.

BRITS, L. (2019). "The importance of making time for leisure". *Medium*. Hyperlink: [https://medium.com/live-your-life-on-purpose/the-importance-of-making-time-for-leisure-33d6cf3788e0]. Retrieved on 17 September 2020.

BUDLENDER, D. (1999). Patterns of poverty in South Africa. *Development Southern Africa*, 16(2): 197-219. https://doi.org/10.1080/03768359908440073

BURDEN, N.; SIMPSON, J.; MURRAY, C.; OVERTON, P.G. & POWELL, P.A. (2018). Prosthesis use is associated with reduced physical self-disgust in limb amputees. *Body Image*, 27: 109-117. https://doi.org/10.1016/j.bodyim.2018.08.001

COUTURE, M.; CARON, C.D. & DESROSIERS, J. (2010). Leisure activities following a lower limb amputation. *Disability and Rehabilitation*, 32(1): 57-64. https://doi.org/10.3109/09638280902998797

CRAWFORD, D. W.; JACKSON, E. L. & GODBEY, G. (1991). A hierarchical model of leisure constraints. *Leisure Sciences*, 13(4): 309-320. https://doi.org/10.1080/01490409109513147

CREIGHTON-SMITH, B.A.; COOK, M. & EDGINTON, C.R. (2017). Leisure, ethics, and spirituality. *Annals of Leisure Research*, 20(5): 546-562. https://doi.org/10.1080/11745398.2017.1295873

CSIKSZENTMIHALYI, M. (1997). *Finding Flow: The psychology of engagement with everyday life*. New York, NY: Basic Books.

DARCY, S.; LOCK, D. & TAYLOR, T. (2017). Enabling inclusive sport participation: Effects of disability and support needs on constraints to sport participation. *Leisure Sciences*, 39(1): 20-41. doi:10.1080/01490400.2016.1151842

EDGINTON, C.R. (2012). Leisure services and infrastructure: Transforming communities and economies. *African Journal for Physical Health Education, Recreation and Dance*, 18(4): 1-13.

EHDE, D.M.; CZERNIECKI, J.M.; SMITH, D.G.; CAMPBELL, K.M.; EDWARDS, W.T.; JENSEN, M.P. & ROBINSON, L.R. (2000). Chronic phantom sensations, phantom pain, residual limb pain, and other regional pain after lower limb amputation. *Archives of Physical Medicine and Rehabilitation*, 81(8): 1039-1044.

ENNION, L. & YU, T.W. (2019). Participation restrictions and vocational rehabilitation needs experienced by persons with a unilateral lower limb amputation in the Western Cape, South Africa. *African Journal of Disability*, 8(1): 1-7.

ESQUENAZI, A. & YOO, S.K. (2021). "Lower limb amputations: Epidemiology and assessment". *PM&R Knowledge Now*. [https://now.aapmr.org/lower-limb-amputations-epidemiology-and-assessment]. Retrieved on 1 November 2023.

FANCOURT, D.; AUGHTERSON, H.; FINN, S., WALKER, E. & STEPTOE, A. (2021). How leisure activities affect health: a narrative review and multi-level theoretical framework of mechanisms of action. *The Lancet Psychiatry*, 8(4): 329-339. https://doi.org/10.1016/S2215-0366(20)30384-9

GALLAGHER, P.; O'DONOVAN, M.; DOYLE, A. & DESMOND, D. (2011). Environmental barriers, activity limitations and participation restrictions experienced by people with major limb amputation. *Prosthesis and Orthotics International*, 35: 278-284. https://doi.org/10.1177%2F0309364611407108

GODBEY, G. (2008). *Leisure in your life: New perspectives*. Edmonton, Canada: Venture Publishing.

GODLWANA, L. & STEWART, A. (2013). The impact of lower limb amputation on community reintegration of a population in Johannesburg: A qualitative perspective. *South African Journal of Physiotherapy*, 69(4): 48-54. https://doi.org/10.4102/sajp.v69i4.379

HAWKINS, B.A.; PENG, J.; HSIEH, C.M. & EKLUND, S.J. (1999). Leisure constraints: A replication and extension of construct development. *Leisure Sciences*, 21(3): 179-192. https://doi.org/10.1080/014904099273066

HENDERSON, K. (2010). *Dimensions of leisure for life: Individuals and society*. Champaign, IL: Human Kinetics.

HENWOOD, T.; TUCKETT, A. & TURNER, C. 2012. What makes a healthier nurse, workplace or leisure physical activity? Informed by the Australian and New Zealand e-Cohort Study. *Journal of Clinical Nursing*, 21(11-12): 1746-1754. https://doi.org/10.1111/j.1365-2702.2011.03994.x

HURD, A.R. & ANDERSON, D.M. (2010). *The park and recreation professional's handbook*. Champagne, IL: Human Kinetics.

JACKSON, E. L.; CRAWFORD, D. W. & GODBEY, G. (1993). Negotiation of leisure constraints. *Leisure Sciences*, 15(1): 1-11. https://doi.org/10.1080/01490409309513182

JACKSON, E.L. (1999). Comment on Hawkins *et al*., ''Leisure constraints: A replication and extension of construct development''. *Leisure Sciences*, 21: 195-199. https://doi.org/10.1080/014904099273084

JACKSON, E.L. (2000). Will research on leisure constraints still be relevant in the twenty-first century? *Journal of Leisure Research*, 32(1): 62-68. https://doi.org/10.1080/00222216.2000.11949887

KARS, C.; HOFMAN, M.; GEERTZEN, J.H.; PEPPING, G.J. & DEKKER, R. (2009). Participation in sports by lower limb amputees in the Province of Drenthe, The Netherlands. *Prosthetics and Orthotics International*, 33(4): 356-367. https://doi.org/10.3109%2F03093640902984579

KATZ, P.; MORRIS, A.; GREGORICH, S.; YAZDANY, J.; EISNER, M.; YELIN, E. & BLANC, P. (2009). Valued life activity disability played a significant role in self-rated health among adults with chronic health conditions. *Journal of Clinical Epidemiology*, 62(2): 158-166. https://doi.org/10.1016/j.jclinepi.2008.06.002

KELLY, J.R. (2019). *Leisure identities and interactions*. New York, NY: Routledge.

KLUTE, G.K., BERGE, J.S., ORENDURFF, M.S., WILLIAMS, R.M. & CZERNIECKI, J.M. (2006). Prosthetic intervention effects on activity of lower-extremity amputees. *Archives of Physical Medicine and Rehabilitation*, 87(5): 717-722. https://doi.org/10.1016/j.apmr.2006.02.007

LABBÉ, D., MILLER, W.C. & NG, R. (2019). Participating more, participating better: Health benefits of adaptive leisure for people with disabilities. *Disability and Health Journal*, 12(2): 287-295. https://doi.org/10.1016/j.dhjo.2018.11.007

LAYLAND, E.K.; HILL, B.J. & NELSON, L.J. (2018). Freedom to explore the self: How emerging adults use leisure to develop identity. *The Journal of Positive Psychology*, 13(1): 78-91.

LEITNER, M.J. & LEITNER, S.F. (2012). *Leisure enhancement*. (4th ed). Urbana, IL: Sagamore Publishing.

LI, J., ZENG, B. & LI, P. (2021). The influence of leisure activity types and involvement levels on leisure benefits in older adults. *Frontiers in Public Health*, 9: 659263.

LYU, S.O.; OH, C.O. & LEE, H. (2013). The influence of extraversion on leisure constraints negotiation process: A case of Korean people with disabilities. *Journal of Leisure Research*, 45(2): 233-252. https://doi.org/10.18666/jlr-2013-v45-i2-3013

MAGI, L.M. (1999). Township recreation patterns and the new order in South Africa. *Tourism Geographies*, 1(3): 293-312. https://doi.org/10.1080/14616689908721323

MAJNEMER, A.; SHEVELL, M.; LAW, M.; BIRNBAUM, R.; CHILINGARYAN, G.; ROSENBAUM, P. & POULIN, C. (2008). Participation and enjoyment of leisure activities in school-aged children with cerebral palsy. *Developmental Medicine & Child Neurology*, 50(10): 751-758. https://doi.org/10.1111/j.1469-8749.2008.03068.x

MANSFIELD, L.; DAYKIN, N. & KAY, T. (2020). Leisure and wellbeing. *Leisure Studies*, 39(1): 1-10. https://doi.org/10.1080/02614367.2020.1713195

MATOS, D.R.; NAVES, J.F. & ARAUJO, T.C.C.F.D. (2020). Quality of life of patients with lower limb amputation with prostheses. *Estudos de Psicologia (Campinas)*, 37: e190047. https://doi.org/10.1590/1982-0275202037e190047

MCLEAN, D.D.; HURD, A.R. & ROGERS, N.B. (2008). *Leisure and recreation in modern society*. Burlington, MA: Jones & Bartlet.

MÜNGER, M.; PINTO, C.B.; PACHECO-BARRIOS, K.; DUARTE, D.; ENES GUNDUZ, M.; SIMIS, M.; BATTISTELLA, L.R. & FREGNI, F. (2020). Protective and risk factors for phantom limb pain and residual limb pain severity. *Pain Practice*, 20(6): 578-587. https://doi.org/10.1111/papr.12881

O'SULLIVAN, E. (2013). *Introduction to recreation and leisure*. (2nd ed.) Champaign, IL: Human Kinetics.

PINELLO, A. (2020). Sport participation for people with disabilities: Examining perceived constraints to participation in sport. Unpublished master's thesis. Harrisonburg, Virginia: James Madison University.

PRIEST, S. & GASS, M. A. (2005). *Effective leadership in adventure programming*. (2nd ed). Champaign: IL, Human Kinetics.

RUSSELL, R.V. & JAMIESON, L.M. (2008). Leisure program planning and delivery. Champaign, IL: Human Kinetics.

SON, J.S.; KERSTETTER, D.L.; YARNAL, C.M. & BAKER, B.L. (2007). Promoting older women's health and well-being through social leisure environments: what we have learned from the Red Hat Society®. *Journal of Women & Aging*, 19(3-4):89-104. https://doi.org/10.1300/J074v19n03_07

SPAHN, K.; WYATT, M.P.; STEWART, J.M.; MAZZONE, B.N.; YODER, A.J. & KUHN, K.M. (2019). Do gait and functional parameters change after transtibial amputation following attempted limb preservation in a military population? *Clinical Orthopaedics and Related Research*, 477(4): 829. doi:10.1097/CORR.0000000000000409

STUMBO, J. N., & PETERSON, C. A. (2021). *Therapeutic recreation program design: principles and procedures*. Champaign, IL: Sagamore-Venture.

WADEY, R. & DAY, M. (2018). A longitudinal examination of leisure time physical activity following amputation in England. *Psychology of Sport & Exercise*, 37: 251-261. https://doi.org/10.1016/j.psychsport.2017.11.005

WHITING, J. & HANNAM, K. (2015). Creativity, self-expression and leisure. *Leisure Studies*, 34(3): 372-384. https://doi.org/10.1080/02614367.2014.923494

WORLD HEALTH ORGANIZATION (WHO). (2020). "Body mass index – BMI". *World Health Organization*. Hyperlink: [https://www.euro.who.int/en/health-topics/disease-prevention/nutrition/a-healthy-lifestyle/body-mass-index-bmi]. Retrieved on 6 December 2020.

WORLD HEALTH ORGANIZATION (WHO). (2011). "WHOQOL-DISABILITIES Module: Manual". *World Health Organization*. Hyperlink: [https://www.who.int/mental_health/evidence/WHOQOL_DIS_Manual.pdf]. Retrieved on 7 January 2018.

WING, Y.T. (2017). Participation restrictions and vocational needs amongst persons with a lower limb amputation in Cape Town, South Africa. Mini dissertation. Cape Town, South Africa: University of the Western Cape.

YARI, P.; DIJKSTRA, P.U. & GEERTZEN, J.H. (2008). Functional outcome of hip disarticulation and hemipelvectomy: A cross-sectional national descriptive study in the Netherlands. *Clinical Rehabilitation*, 22(12): 1127-1133. https://doi.org/10.1177%2F0269215508095088

Corresponding author: Dr Cindy Kriel; **Email:** *Cindy.Kriel@nwu.ac.za*