

*Original article (short paper)*

## Quality of life of Brazilian wheelchair tennis athletes across competitive and elite levels

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**Abstract — Aims:** This study aimed to identify Brazilian wheelchair tennis athletes' quality of life and to compare the perception scores between competitive and elite athletes. **Methods:** Participants were wheelchair tennis athletes (N = 31) from Brazil (males = 25, females = 6) divided into two groups: competitive and elite. Data was collected using the Brazilian version of the WHOQOL-Bref. The WHOQOL-Bref asks two general questions, and is thereafter divided into four main domains: 1) physical, psychological, social, and environment, which give us an understanding of their overall quality of life perception. **Results:** The results showed that overall, 29 out of the 31 athletes perceived their quality of life positively, regardless of the competitive level. However, statistically higher perceptions were found in the physical domain and the total score of quality of life of the elite group. **Conclusion:** The findings of this study suggest that even though participation in high-performance adapted sports may offer a stressful and exhausting environment, elite wheelchair tennis athletes from Brazil perceive themselves as having a better QoL than competitive athletes.

Keywords: adapted sports, people with disability, quality of life, elite athletes.

### Introduction

Individuals with disabilities have often experienced inequities in various areas of life that negatively affected their overall physical and mental health, and consequently, their quality of life (QoL)<sup>1,2</sup>. One of the areas where these inequities are present is sports. This is in part due to lack of facilities, community awareness, transportation, programs, as well as attitudinal barriers and architectural barriers to accessibility<sup>3,4</sup>.

The good news is that worldwide there is a push to promote people with disabilities' participation in adapted sports so they can acquire the multiple health, social, and psychological benefits that often result<sup>5-7</sup>. Also, because adapted sports practice integrates different types of disabilities and offers an enjoyable environment for social integration, it breaks down barriers of disability, prejudice, age, gender, and socioeconomic status<sup>8,9</sup>. Thus, adapted sports have been identified as an option for promoting an overall better QoL of athletes with disabilities<sup>9-13</sup>.

QoL refers to a multi-dimensional construct related to the person's perception and satisfaction of their own living conditions, considering all the different aspects of their own life<sup>10</sup>. In fact, there is no universal definition of QoL. Some professionals associate QoL with ideas of satisfaction and happiness, while for other professionals, QoL is more complex, including also general physical and mental health, cognitive functions, and private and social life functioning<sup>14</sup>.

Although researchers recommend participation of people with disabilities in adapted sports for rehabilitation and recreation purposes<sup>8,13</sup>, it seems that participation in sporting events do not receive the same attention. Sporting events create important opportunities for athletes to showcase their skills and integrate themselves into the community<sup>15,16</sup>. Events such as the Parapan and Paralympics games are widely respected and attended. Within the Parapan and the Paralympics games, wheelchair tennis has emerged as one of the favorites among players and spectators. Wheelchair tennis was invented in 1976 by Brad Parks and established as a Paralympic event at the

Seoul 1988 Games<sup>17</sup>. The levels of interest and competition have both been increasing.

Traditionally, highly competitive sporting events for athletes without disabilities have been identified as a source of stress due to physical, social, and emotional demands<sup>18-20</sup>. In addition, the literature regarding physical activity and physical education teaches us that families of children with disabilities tend to be overprotective, and in many cases do not provide physical activity opportunities for their family member with a disability because of fears of injury<sup>21,22</sup>. For these reasons, wheelchair tennis might not be desirable and supported by some families of athletes with disabilities.

On the one hand the literature regarding to the impact of adapted sports on people with physical disabilities QoL is well established, considering the multiple studies identifying positive perception of athletes with disabilities when compared to their inactive peers<sup>10-12</sup>. On the other hand, the literature regarding to the participation of athletes with disabilities in high-performance contexts is only incipient<sup>23</sup>, especially in terms of QoL perception. Hence, the purpose of this study was twofold: first, to identify Brazilian wheelchair tennis athletes' QoL in competitive settings; and second, to compare QoL perception scores between Brazilian competitive and elite wheelchair tennis athletes.

For purpose of this study, competitive athletes were defined as those players who practice sports for participating in regional, state and national competitions but neither reach the top results nor represent their country in international competitions. Elite athletes, on the other hand, were defined as top-level players who practice sports representing their country in national and

international competitions, aiming to break records and to reach their maximum performance. We selected Brazil as a potential model for South America to advocate for an increase in adapted sports events in other South American countries. By promoting a better understanding of Brazilian wheelchair tennis athletes' QoL perceptions, other South American countries can follow suit and begin to launch similar programs within their own communities. Universities, parents of individuals with disabilities, and sport programs can use this information to integrate adapted sports into their programs.

## Methods

### Participants

Participants (N = 31) consisted of wheelchair tennis athletes from Brazil (males = 25, females = 6) between the ages of 19-65 ( $M = 39.25$ ,  $SD = 11.5$ ). The sample was stratified according to its competitive level: competitive group ( $n = 25$ ) and elite group ( $n = 6$ ). The competitive group was composed of athletes from a wheelchair tennis program run by a university in the south of Brazil, as well as participants of an international tournament of wheelchair tennis in the south of Brazil. The elite group was composed of the entire six members of the Brazilian wheelchair tennis national team, all of which have previously participated in Parapan American Games, and five out of the six subjects also participated in the London 2012 Paralympic Games. See table 1 for further information about the personal characteristics of both groups.

Table 1. Personal characteristics of Wheelchair tennis participants

Competitive level	Mean age (years)	Gender		Cause of disability		Average years practicing wheelchair tennis
		Female	Male	Congenital	Acquired	
Competitive	40.9±11.50	4	21	2	23	7.2±6.22
Elite	32.8±10.25	2	4	1	5	10.3±2.42
Total	39.2±11.57	6	25	3	28	7.8±5.80

### Measuring Quality of Life

The Brazilian version of the World Health Organization Quality of Life - Bref (WHOQOL-Bref) instrument was used to analyze the participants' quality of life perception. This instrument was validated and translated by Fleck, Louzada<sup>24</sup> to Brazilian Portuguese and presented a satisfactory correlation ( $0 \pm 69$  or above) to the English version. Fleck, Louzada<sup>24</sup> found satisfactory reliability scores for all the domains: physical (0.84), psychological (0.79), social (0.69), and environment (0.71). The WHOQOL-Bref uses a five-point Likert-scale design, where athletes rate their level of satisfaction (strongly agree, agree) or dissatisfaction (strongly disagree, disagree), or remain

neutral by selecting 'neither agree nor disagree'. The instrument contains 26 questions and is divided in four domains; see table 2 for further understanding. The authors also administered a short, informational survey to the athletes in order to collect personal information such as type of injury, cause of disability, competitive level, and total years practicing wheelchair tennis.

### Data Collection

Prior to the selection of participants, permission was obtained from the lead author's university institutional review board. The research method was a descriptive, cross-sectional survey<sup>26</sup>. To

participate in the study, subjects signed an informed consent (IC) given by two of the coauthors, who were trained and standardized

for applying the IC, the instrument, and the informational survey. Participants spent 10 to 15 minutes completing the questionnaire.

Table 2. WHOQOL-Bref's facets according to the domains and the number of the question it appears

Domain	Questions' facets	Question number in the WHOQOL-Bref
General items	Quality of life rating	1
	Health satisfaction	2
Physical	Pain and discomfort	3
	Medication	4
	Energy and fatigue	10
	Mobility	15
	Sleep quality	16
	Daily activities	17
	Work capacity	18
	Psychological	Positive Feelings
Spirituality, religion and personal beliefs		6
Thinking and concentration		7
Body image and appearance		11
Self-esteem		19
Negative feelings		26
Social	Relationships	20
	Sexual activity	21
	Social support	22
Environment	Safety and security	8
	Physical environment quality	9
	Finances	12
	Information access	13
	Leisure activities	14
	Home environment	23
	Access and quality of health care services	24
Transport	25	

Note. Adapted from Krägeloh, Henning<sup>25</sup>

The data collection took place over a period of six months and at two different sites: In May of 2014, six regional participants from a wheelchair tennis program run by a university in the south of Brazil were contacted to schedule an appointment for data collection before the beginning of a practice. In October of 2014, 25 participants from an international tournament of wheelchair tennis in the south of Brazil were contacted on the first day of competition to participate in this study; questionnaires were distributed between the athletes' matches, in order not to compromise their participation in the competition.

### Data Analysis

In order to analyze participants' responses provided through the WHOQOL-Bref instrument, the authors performed the data interpretation suggested by the World Health Organization<sup>27</sup>. Specifically for the first question of the questionnaire "How would you rate your QoL?", participants who answered "very poor", "poor" or "neither poor nor good" were classified with a negative perception, and participants who answered "good" or "very good" were classified with a positive perception.

Regarding statistical data analysis, descriptive statistics with mean values, standard deviation, and absolute and relative frequency were used (e.g., average years practicing wheelchair tennis). The Shapiro-Wilk test was used to verify the data normality of the quantitative variables. The WHOQOL-Bref domains presenting normal distribution were physical, environment, and the overall score for QoL, whereas the psychological and social domains did not show normal distribution.

Fisher's exact test was performed for the categorically classified variables (QoL perception). Participants' data contained no gender differences. Student's t-test was used to compare the scores of the physical and the environment domains, and the overall QoL between the competitive and elite groups, while the Mann-Whitney U test was performed to compare the scores of psychological and social domains. The effect size was calculated from the information suggested by Cohen<sup>28</sup>. Data were analyzed using SPSS v.21.0. with confidence levels set at 95%.

## Results

By analyzing the general perception of QoL among all participants, this study found that 29 out of the 31 athletes perceived their QoL positively. When observing each group's overall QoL perception, all of the participants of the elite group felt satisfied, whereas two out of the 25 participants of the competitive group presented negative perceptions of QoL. After applying the Fisher's exact test to verify similarities between the two groups, no significant differences were found regarding their general perception of QoL ( $p=.645$ ) (See Table 3).

Statistically higher scores were found in the elite group regarding the physical domain ( $p=.003$ ) and the total score of QoL ( $p=.001$ ), whereas no statistical differences were found regarding the psychological ( $p=.105$ ), social ( $p=.095$ ), and environment domains ( $p=.323$ ). In addition, the effect size indicated a moderate difference between the groups analyzed for the physical domain and the total score of QoL perception (See Table 4).

Table 3. Quality of life perception according to the competitive level

Groups	Quality of life perception		<i>p</i> <sup>a</sup>
	Positive	Negative	
	n (%)	n (%)	
Competitive	23 (92.0)	2 (8.0)	0.645
Elite	6 (100.0)	0 (0.0)	
Total	29 (93.5)	2 (6.5)	

<sup>a</sup>Fisher's exact test.

Table 4. WHOQOL-Bref's quality of life domains according to the competitive level

Quality of life domains	Competitive Group	Elite Group	<i>p</i>	Cohen'D	Effect Size
	M ± SD	M ± SD			
Physical	69.4 ± 13.4	82.1 ± 6.4	0.003 <sup>b</sup>	1.209	0.517
Psychological	78.8 ± 11.7	86.8 ± 4.9	0.105 <sup>†</sup>	0.891	0.407
Social	77.3 ± 14.1	87.5 ± 7.0	0.095 <sup>†</sup>	0.916	0.416
Environment	70.1 ± 13.8	75.5 ± 10.7	0.323 <sup>b</sup>	0.437	0.213
Total	73.9 ± 10.2	83.0 ± 3.1	0.001 <sup>b</sup>	1.207	0.516

<sup>b</sup>Student's t-test. <sup>†</sup>Mann-Whitney U test.

## Discussion

The perceived QoL of athletes with disabilities have been studied in the field of adapted physical activity for many years. Overall, results reveal the positive impact of adapted sports in the QoL perception of these athletes<sup>10,12,29</sup>. However, the research-base is underdeveloped on the QoL of elite athletes with disabilities who participate in the high-performance setting. The current study

covered 100% of the Brazilian national wheelchair tennis team and collected data during one of the biggest wheelchair tennis events in Brazil. Despite the small sample size, the exclusion of players who practice wheelchair tennis recreationally, and those who participate in different competitions around the country, this study's findings magnify the need for heighten their awareness. Faculty and administrators should be developing and implementing strategies to further promote adapted sports in high-performance

environments, due to the higher scores of QoL among Brazilian elite athletes in comparison to competitive athletes with disabilities.

The first purpose of this study was to identify Brazilian wheelchair tennis athletes' QoL in competitive settings. Although this study focused on wheelchair tennis athletes, our findings are in agreement with previous research on other adapted sports<sup>10,12,14</sup>. In this particular study, wheelchair tennis might have served as an outlet for these athletes to present a positive QoL, considering that this population often encounters social, physical and psychological barriers throughout their life due to the physical impairments<sup>8,30</sup>. Professionals have demonstrated that when someone has a positive QoL their overall perception of life satisfaction is higher<sup>12</sup> and consequently, the individual may perceive he/she has better control of his/her life, and may pursue social relationships and engage in activities for personal improvements or for society in general. Most of the data collection process for the current study took place in a competitive environment, which might have influenced negatively the QoL perceptions of both groups due to stress and anxiety. Nevertheless, the results showed that the vast majority of the athletes who participated in this study, regardless of their level of competition, perceived their QoL positively.

The second purpose of this study was to compare QoL domain scores between Brazilian competitive and elite wheelchair tennis athletes. In this respect, the results showed statistically higher scores of the physical domain and the total score of QoL perception in the elite group ( $p \leq .05$ ). These findings are similar to those reported by Yazicioglu, Yavuz<sup>12</sup>, in which significantly higher scores were found in the physical, psychological, and social domains of QoL in elite adapted sports athletes in comparison to non-sports participants. However, this study highlights the fact that even when comparing two groups of people with disabilities who practice adapted sports, each for a considerable length of time (7.8 years in average), higher levels of competition present higher perceptions of QoL. These findings contradict the existing trend that high-performance sports settings might not be a desirable environment for people with or without disabilities to participate in, given the elevated psychological and physical demands of this context<sup>18-20</sup>. Since our findings suggest that athletes perceive QoL even more positively in a high-performance setting, this information can be used to educate athletes with disabilities and family members who may have reservations about adapted sports in a highly competitive environment, as well as to motivate competitive and elite South American wheelchair tennis athletes to participate in the high-performance context.

In a similar comparative study, Noce, Simim<sup>11</sup> study also used the WHOQOL-Bref instrument to assess QoL perceptions among ten inactive individuals with disabilities and ten active individuals with disabilities playing wheelchair basketball in Brazil. The authors found total QoL score means of 53.23 for the inactive group and 71.60 for the active group. Moreover, when comparing the scores found by Noce, Simim<sup>11</sup> to the ones found in this study, some points are important to highlight: a) the elite group of this study presented the highest mean of QoL among these groups (83.0); b) the competitive group of this study and the active group of Noce, Simim<sup>11</sup> study presented similar means of total QoL (73.9 and 71.6, respectively); c) the inactive group of Noce, Simim<sup>11</sup> study presented the lowest mean of total QoL (53.2). Therefore, besides adapted sports practice itself, three other important aspects are suggested to promote better

QoL perceptions among athletes with disabilities: a higher per week frequency<sup>14</sup>, the number of years spent participating in adapted sports since the onset of the disability<sup>31</sup>, and this study's suggestion that participation in higher competitive levels also contributes to higher QoL perceptions.

As previously mentioned, QoL is a multidimensional concept that includes the domains of physical, psychological, social, environment, amongst others. Professionals in the field of disability sports have suggested that sports serve as a tool for social integration, to overcome physical and psychological barriers perceived through disabilities, and to promote health and QoL<sup>8,30</sup>. Although the findings of this study support participation in high-performance adapted sports as an option for promoting a positive QoL for athletes with disabilities, participation in other contexts (e.g., recreational sports) can also bring desired improvements in QoL for this population, considering that the competitive group also presented positive perceptions of QoL (23 out of 25 athletes). According to Zabriskie, Lundberg<sup>13</sup>, participating in other contexts, such as recreational sports, results in better social interactions for individuals with disabilities, as well as helping them to strengthen their quality of family life. These athletes begin to perceive their achievements in adapted sports as something that can affect the family unit positively, which in turn, provides benefits to their families through sports practice and increased self-esteem<sup>13</sup>.

Future research should analyze more deeply the specific factors in the physical domain that provide a higher perception of QoL among professional athletes. Moreover, research is needed to better understand the specific factors that make elite athletes present higher perceived scores of QoL when compared to recreational and competitive players, which were not analyzed in this study, such as: gender, training time (in hours and years), and degree of injury, among others.

## Conclusions

In conclusion, the authors suggest that wheelchair tennis players from Brazil who participated in this study exhibited a positive QoL perception regardless of the level of competition. In addition, the current findings provide evidence that elite wheelchair tennis athletes in Brazil presented a significantly higher overall QoL perception score in comparison to competitive players, namely in the physical domain. However, people with disabilities participating in adapted sports activities do not necessarily need to have the elite competitive level as their ultimate goal; involvement in adapted sports by itself is sufficient for presenting a positive perception of quality of life.

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