

Abstract

Worldwide, approximately 10% of the population live with disability. Of those, 10% require a wheelchair; only 15% have a wheelchair suitable for them. (Toro, Eke, & Perlman, 2016). Economic realities in low-and-middle-income countries create the necessity of outcome measures for wheelchair users in these areas. Evidence-based practice in wheelchair provision can be supported by wheelchair outcome measures. These practices are of distinct importance due to the low level of provision for individuals whose physical disabilities require the use of a wheelchair. Existing outcome measures largely omit user feedback, relying on therapist or helper feedback (Harris, 2007). Risk of faulty interpretation and erroneous data is therefore inherent to these measures. The Wheelchair Satisfaction Questionnaire (WSQ) was developed as a user-informed snapshot of the individual's level of satisfaction regarding the interface with their wheelchair. The current study examined the development of the WSQ and its test-retest reliability. The WSQ is comprised of 16 visual analogue scale questions; each question includes a section for explanatory comments.

Introduction

Research in the area of wheelchair suitability is vitally important for the establishment of adequate provision of wheelchairs for those who need them (Van der Veen et al., 2017). Existing outcome measures either omit input from the user or encompass a spectrum spanning all types of assistive technology. If assistive devices, including wheelchairs, are to be improved, user satisfaction is a relevant measure. As most users of wheelchairs are not direct consumers, their input rarely affects design or functionality.

The WSQ represents a unique test measure that is user-informed and wheelchair-specific. It is brief, comprehensive, and generalizable. Simplicity of word choice and sentence structure gives the WSQ the possibility of being easily translated into other languages. Parametric precision is provided by a visual analogue scale.

For individuals in low-and-middle-income countries (LMICs), input from wheelchair users is insufficient. This lack of data is reflected in unsatisfactory design and provision of wheelchairs often found in these areas. The goal of the WSQ is the inclusion of previously excluded persons in the process of improving design and provision.



Method

All participants were students who attended the Joytown Secondary School in Thika, Kenya, which serves students with disabilities. Ages ranged from thirteen to 24, with a mean age of 17.86 years. Thirty-four participants were female; 39 were male. Four diagnoses represented the majority of participants: Muscular Dystrophy (21.9%), Cerebral Palsy (16.4%), Spina Bifida (15.1%), and Osteogenesis Imperfecta (13.7%). All students at the school who had used a manual wheelchair for at least six months were eligible to participate.

The WSQ is comprised of 16 questions. Fifteen questions address explicit aspects of a wheelchair (foot supports, casters, etc.) and the final question addresses overall satisfaction. Strong parametric statistical analysis methods best reflect responsiveness to difference. The format of the WSQ, therefore, employs a visual analogue scale. Continuous data was thus obtained. Space for explanatory comments are included with each question, allowing for increased responsiveness of mixed methods patient report studies (see Figure 1).

Seventy-three participants completed the WSQ twice. There was one week between each test administration. The WSQ instructs placement of a vertical mark anywhere on the line to indicate each question's score. One full sentence is requested via each question's comment section, in order to qualify said score. A visual demonstration was given to the participants by the researcher in marking the analogue scale (line) via white board. Each administration of the WSQ occurred during one session. The WSQ was presented in English. Assistants were present in case translation into the local dialect was required. Participants were given a verbal reminder to answer each question honestly and without peer input.

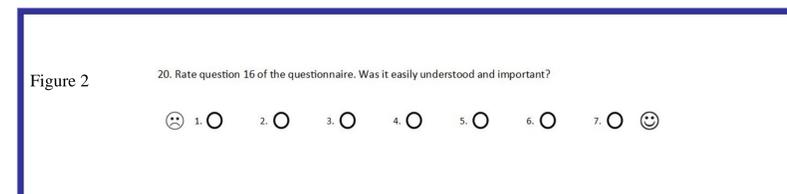
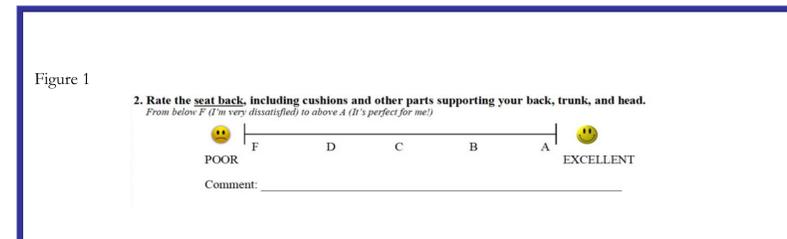
Following Test 2, the WSQ was rated by an expert panel comprised of 15 Participants. Each completed the Feedback for the WSQ (WSQ-F) (see Figure 2).

Results & Discussion

Of 73 participants who completed the WSQ, eight were excluded after Test 1 due to incomplete Questionnaires. This left 65 Participants, all of whom completed the questionnaire fully in test 1, and in test 2. An Interclass Correlation Coefficient resulted in $r(63) = .863$, $p = .0001$.

The WSQ was determined to have test-retest reliability, confirming the original hypothesis. The WSQ is an outcome measure that can provide user-informed data to manufacturers and providers of manual-push wheelchairs. The data can be utilized to better inform design and provision. Due to the scope of data, the efficacy of individual components can be analyzed. Wheelchair types can also be analyzed, and those indicating consistent problems can be identified. As a result of this data, wheelchair users will be better represented and thus better served. The WSQ was therefore determined to be reliable as an outcome measure for an individual's level of satisfaction with their current wheelchair.

Data obtained from the WSQ can provide wheelchair manufacturers and providers with relevant information leading to better design and provision for individuals in previously underrepresented groups.



Conclusions

The results support the WSQ as a reliable measure, confirming the original hypothesis. Because the WSQ provides user feedback on particular aspects of wheelchair structure and function, the efficacy of individual components can be underscored. Studies using the WSQ to assess specific wheelchair types could indicate consistent patterns of response, revealing relevant design issues. The WSQ enables wheelchair users to give wheelchair-specific feedback: thus, they gain a voice that allows better representation and benefit. Consequent prospects for increased mobility offer improved health, opportunity, and interaction.

Limitations of the current study include participant age range and geographic representation. Ideally, a sample might reflect a multi-national population or wider age range for broader perspective. Recommended future research utilizing the WSQ includes between-subjects analyses regarding wheelchair type/overall satisfaction, gender/components, and age/components.

References

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