



JÖNKÖPING UNIVERSITY  
*School of Health and Welfare*

# **Patient satisfaction and mobility with their assistive device and service**

PAPER WITHIN *Prosthetics and Orthotics*  
AUTHORS: *Mehdi Nasser, Robert Westergren*  
TUTOR: *Nerrolyn Ramstrand*  
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## Abstract

### Objective

To gather knowledge related to patient satisfaction and mobility with lower limb prosthetic and orthotic devices and to investigate satisfaction with services received. Another purpose of this study is to analyze potential differences between orthotic and prosthetic patients in relation to patient satisfaction and mobility.

### Design

Cross-sectional study

### Subjects

21 participants with a mean age of 58 (SD 16) with an average duration of use of devices of 10 (SD 10) years. 12 out of the 21 participants were orthotic users and 9 were prosthetic users.

### Methods

Patients were asked to complete two questionnaires, one regarding satisfaction with assistive device and service (QUEST 2.0) and one regarding mobility.

### Results

Patients mean score regarding satisfaction with assistive device and service were 4.0 (SD 0.8) and 4.2 (SD 1.0) respectively. 91% reported that they had the ability to walk at least 100 meters with their assistive device. The areas where participants experienced most difficulties were walking on uneven ground (70%), walking up and down a hill (57%) and walking on stairs (57%).

### Conclusion

Overall this study demonstrates that participants were quite satisfied with their assistive device and the service received by the P&O clinic. No statistically significant differences regarding satisfaction with assistive device and service, or mobility, were found between prosthetic and orthotic participants.

## Sammanfattning – Patientnöjdhet med hjälpmedel och service samt patientmobilitet

### Syfte

Att samla kunskap kring patientnöjdhet och mobilitet med protes och ortos för nedre extremiteter och nöjdhet med mottagen service. Ytterliggare ett syfte är att jämföra potentiella skillnader kring patientnöjdhet och mobilitet mellan ortos- och protesbrukare.

### Design

Cross-sectional studie.

### Deltagare

21 deltagare med en medelålder på 58 (SD 18) år med ett snitt på 10 (SD 10) års användarperiod. Av de 21 deltagarna var 12 ortosbrukare och 9 protesbrukare.

### Metod

Patienter ombads att fylla i två enkäter, en gällande patientnöjdhet med hjälpmedel och service (QUEST 2.0) och en rörande mobilitet.

### Resultat

Patienternas betygsatte deras nöjdhet med hjälpmedlet med ett medelvärde på 4.0 (SD 0.8) och servicen med ett medelvärde på 4.2 (SD 1.0). 91% rapporterade att de hade förmågan att gå minst 100 meter med hjälpmedlet. De största rapporterade problemområden av patienterna var förmågan att gå på ojämn terräng (70%), förmågan att gå i upp- och nedförsbacke (57%) och att gå i trappor (57%).

### Slutsats

Studien visar att deltagarna var ganska nöjda med deras hjälpmedel och servicen de fått på kliniken. Ingen statistisk signifikant skillnad gällande nöjdhet med hjälpmedel och service, eller mobilitet, kunde hittas mellan protes- och ortosbrukare.

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## Introduction

Today, we have come to a point where more importance is being placed on quality of our healthcare system. The ease in which patients and consumers can gather information and be better informed puts more pressure on the quality of care provided by healthcare professions. In 2007 the United Nations put forward The Convention of Rights for Persons with Disabilities (CRPD), an agreement between 159 parties with the purpose of promoting and protecting the freedom and human rights for all persons with disabilities (1). Sweden is one of the parties to have signed and agreed upon the CRPD. Article 20 of the CRPD specifically relates to personal mobility and states that parties who have signed the CRPD are to provide available and affordable prosthetic and orthotic services. One way to evaluate this is to gather data on patient mobility and patient satisfaction of their assistive device and received service. The data will help us evaluate the prescribed assistive device for the patient and find potential areas of improvement.

Given that satisfaction with service and mobility of patients within the field of Prosthetics and Orthotics (P&O) has been shown to differ across countries (2-4) it is relevant to investigate the situation in Sweden. Measuring patient satisfaction related to provision of orthotic and prosthetic devices has primarily been done by using standardized questionnaires (2, 3, 5). The Quebec User Evaluation of Satisfaction with assistive Technology 2.0 (QUEST 2.0) is one survey that has been used in the field of Orthotics and Prosthetics to measure patient satisfaction with assistive devices (2, 3).

The Orthotics and Prosthetics User's Survey (OPUS) is another standardized questionnaire related to patient satisfaction and mobility as well as quality of life. The Short Form 36 Health Survey (SF-36) is also a standardized questionnaire that measures quality of life and mobility. The OPUS and SF-36 have both been used in the field of Orthotics and Prosthetics and they have proven to be both reliable and valid (6-10).

Prostheses and orthoses are devices used by patients with different kinds of diagnoses. Orthotic devices are used as an externally applied device used to modify the structural and functional characteristics of the neuro-muscular and skeletal systems (11). Prosthetic devices are used as an externally applied device used to replace wholly, or in part, an absent or deficient limb segment (11).

Prostheses and orthoses for lower extremities are often prescribed to patients to improve different parameters related to walking. The result might be an increased level of activity and participation that will help improve the overall health of the patient (12).

Questionnaires focusing on patient satisfaction would validate the given treatment of a facility from a patient perspective and could be used as a tool in order to improve the quality of care. In Sweden it is of great importance to follow the CRPD agreement and the National Health Service. Patient satisfaction with a device could possibly be related to their mobility. Patients who are less satisfied with their assistive device may show less hours of usage and in return they may restrict activities of daily living (ADL). Studies have shown that the presence of mobility disabilities increases the risk of low health-related quality of life and lack of participation (13). Therefore it is also important to evaluate patient mobility when evaluating patient satisfaction with a device. I.e. if results from patient satisfaction over weight of the device would show low scores, there could be a correlation to patients walking distance with the assistive device. This could direct the area of improvement of a P&O facility and in the end might improve patient ADL.

## Research related to patient satisfaction and mobility

Hagberg et al. compared results from two assessments of SF-36 and Q-TFA (Questionnaire for persons with a Transfemoral Amputation) in their OPRA (Osseointegrated Prostheses for the Rehabilitation of Amputees) study (14). The assessments were conducted with 2.5 years in between. It was shown that Physical Functioning (PF), Role functioning from a physical perspective (RP), Bodily Pain (BP) and Physical Component Score (PCS) was significantly improved for 17 cases. Results from the Q-TFA showed that the patients improved all four scores (Prosthetic Use, Prosthetic Mobility, Problem and Global score) between assessments (14).

A study conducted in the Netherlands in 2005 analyzed consumer satisfaction regarding the service provided by 15 P&O facilities (5). The consumers included were patients who had been provided with orthoses, prostheses, orthopaedic shoes or other devices at one of the 15 P&O facilities. 1364 subjects completed the SERVQUAL questionnaire which consisted of 16 items measuring consumer perceptions and expectations of the quality of the service provided. Patients were also asked to fill in questions related to satisfaction with delivery time of the device and to rate the P&O facility regarding the service provided on a scale from 1-10 (1 being lowest score and 10 highest). Results showed a mean overall rating of 8.1 regarding service provided by the facilities. It also showed that 93% of the patients were satisfied with the delivery time. The study showed that 8/16 (50%) items of the SERVQUAL questionnaire fulfilled criterion for a satisfactory quality (5). An earlier study conducted at 4 facilities in the Netherlands in 2002 by the same author showed that 12/14 (86%) items of the SERVQUAL questionnaire fulfilled criterion for a satisfactory quality (15). These results suggest decreased patient satisfaction with the quality provided between investigations. The authors suggest that a possible reason why patients have higher expectations on provided quality of service might be because they are more informed through internet.

A retrospective cohort study was conducted in the USA regarding use and satisfaction with prosthetic limb device and satisfaction with service provided. It was shown that patients waiting more than 60 days for first prosthesis fitting were less likely to be satisfied with prosthetic comfort, fit, appearance and overall performance in relation to those waiting within 30 days from limb loss (16). The median time for the whole group (n=935) receiving their first prosthesis was 90 days. The results indicate a negative association between long waiting times for first fitting of a prosthesis and satisfaction with device and use (16). On a 4-point Likert scale, 15,5% of the subjects agreed or strongly agreed to the statement "Prosthetist did not discuss issues that should be discussed" and 17,3% strongly agreed or agreed to "Prosthetist appeared to be in hurry" (16). Results suggest that in order to improve the quality of care, focus should be directed toward improving communication between patient and Prosthetist.

Patient satisfaction with device and service has also been investigated in developing country contexts.

Magnusson et al. used questionnaires in their studies of prosthetic and orthotic users in Malawi and Sierra Leone (2, 3). The items in the questionnaires were comprised of questions related to patient's mobility and use of their assistive device, general satisfaction with the device and the service received (QUEST 2.0), and specific questions related to rehabilitation services. The answers provided by the patient on each items were converted into numbers which formed the data for the cross-sectional study design. Results from the study in Malawi conducted by Magnusson et al. showed that approximately half of the assistive devices that were in use needed repairs. 39% experienced pain from their assistive device and 75% experienced wounds or skin irritation (2). The study conducted in Malawi also demonstrated that the developing country were in need of urgent attention according to implementation of the CRPD regarding personal mobility and access to rehabilitation service (2). The

study conducted in Sierra Leone showed that approximately half of the assistive devices needed repairs (3). The main problem patients reported in the study in Sierra Leone was pain associated with use of the device and service delivery including the fact that they could not afford the fees. The results also indicate that more attention should be given to orthotic patients in developing countries (3).

### **Importance**

Previous research suggests that treatment option for a specific need is easily accessible via internet which might increase patient expectations (5). Evaluating questionnaire results related to patient satisfaction is important in order to analyze if patient's expectations meet up with actual satisfaction of device and provided service of a P&O facility. It would be of great importance to conduct a study of patient satisfaction and mobility with device and service received in Sweden. It would also benefit the P&O profession when evaluating which areas Swedish patients' shows to be less satisfied with. It would be interesting to compare results between similar conducted studies. As no known studies regarding patient satisfaction and mobility with Prosthetics and Orthotics have been conducted in Sweden, the investigators suggest that a study within this field would benefit the implementation of the CRPD agreement and might improve the quality of care. To our knowledge, no study has been conducted in Sweden investigating mobility and patient satisfaction with lower-limb prostheses and orthoses using QUEST 2.0.

### **Aim**

The aim of this study is to gather knowledge related to patient satisfaction and mobility with lower limb prosthetic and orthotic devices. Another purpose of this study is to analyze potential differences between orthotic and prosthetic patients in relation to patient satisfaction and mobility.

## Method

The authors of this report conducted a cross-sectional study based on questionnaires regarding mobility and satisfaction of lower limb orthotic and prosthetic patients.

## Setting & Sampling

Collection of data was conducted at two different facilities in the two largest cities of Sweden, the P&O facilities of Sahlgrenska Universitetssjukhus in Gothenburg and TeamOlmed in the capital Stockholm. The facility in Gothenburg is governed by Västra Götaland County and is one of the largest P&O facilities in Sweden. There are around 70 employees at Sahlgrenska of which you can find P&O clinicians, orthopaedic technician as well as physiotherapists and they hold a good collaboration with orthopaedic doctors at the university hospital nearby. TeamOlmed in Stockholm is a privately owned company that provides P&O service. The company is spread out and has about 20 facilities covering a large part of Sweden with approximately 350 employees. They are also a part of the international company Össur. TeamOlmed have four different facilities in Stockholm, the collection of data was conducted at the facility of Södersjukhuset.

During a five week span eligible patients were asked to participate in the study. Individuals who were eligible to participate were those who were 18 years or older at the time and had had a lower limb prosthesis or orthosis for at least one year. Excluded were partially foot amputated prosthetic patients as well as those who were only prescribed shoes and/or insoles.

## Subjects

Out of 23 subjects who fulfilled the inclusion criteria, 21 chose to participate and were included in the study (n=21). Two patients decided to not participate at the time with fatigue being the reason. 13 (62%) of the participating subjects were men, and 8 (38%) women. The total mean age of the participating subjects was 58 years (SD 16), with the youngest being 30 years and the oldest 91. The average usage time of assistive device of all the participants were 9.5 years (SD 10) with a range of 1-40 years. 57% of the subjects included in the study were orthotic users and 43% were prosthetic users. Information about gender, type of assistive device, mean age and average years of usage are presented in Table 1.

Table 1. Subject demographics, characteristics of device.

	<b>Subjects n (%)</b>
<b>Gender</b>	
- <i>Men</i>	13 (62)
- <i>Women</i>	8 (38)
<b>Prosthesis</b>	9 (43)
- <i>Transtibial (TT)</i>	5 (56)
- <i>Transfemoral (TF)</i>	4(44)
<b>Orthosis</b>	12 (57)
- <i>Ankle Foot Orthosis (AFO)</i>	6 (50)
- <i>Knee Orthosis (KO)</i>	4 (33)
- <i>Knee Ankle Foot Orthosis (KAFO)</i>	2 (17)
	<b>Years (SD)</b>
<b>Mean age</b>	
- <i>All participants</i>	58 (16)
- <i>Men</i>	59 (17)
- <i>Women</i>	57 (14)
- <i>Prosthetic users</i>	63 (17)
- <i>Orthotic users</i>	55 (14)
<b>Average years of usage</b>	
- <i>All participants</i>	10 (10)
- <i>Men</i>	10 (12)
- <i>Women</i>	8 (7)
- <i>Prosthetic users</i>	6 (6)
- <i>Orthotic users</i>	12 (12)

## Procedure

Patients were given two types of questionnaires to fill in, one regarding mobility of prosthetic and orthotic patients which was developed by Magnusson et al. (2, 3), and one regarding service and device satisfaction, Quebec User Evaluation of Satisfaction with Assistive Technology (QUEST 2.0) (17). The patients were given oral and written information about the study as well as a description on how to fill in the questionnaires. Altogether, the questionnaire consisted of 27 items including mobility, service and device satisfaction, demographics and characteristics of device. The demographics and characteristics consisted of 4 items including age, gender, type of assistive device and years using the assistive device.

## Mobility

The mobility questionnaire consisted of 10 items related to mobility with and without the assistive device (Appendix A). The questionnaire related to mobility was developed by Magnusson et al. and was used in their previous studies in low-income countries (2, 3). The items in the questionnaire were constructed after reviewing relevant checklists and questionnaires previously used in studies investigating mobility of patients with assistive devices (2, 3). Patients were required to choose one of 3 or 4 alternative responses for each item. As the authors have no knowledge of a Swedish version of the mobility questionnaire, a translation process was necessary in order to avoid misunderstandings and ensure content validity. The English version, taken from Magnusson et al. was translated into Swedish by the authors. It was then sent to a translator whom back-translated the questionnaire to English. The authors then compared the original version with the back-translated version and it was discussed by the authors.

## QUEST 2.0

The QUEST 2.0 is a standardized assessment tool that collects data related to user satisfaction with assistive devices (Appendix B). It is comprised of 12 items with a rating scale of 1 to 5. 1: Not satisfied at all; 2: Not very satisfied; 3: More or less satisfied; 4: Quite satisfied; 5: Very satisfied (17). In addition to the questions on 12 items, participants are asked to point out the 3 items they feel are the most important. The questionnaire is divided into two sections: device satisfaction and service satisfaction. The section related to device satisfaction consists of 8 items including dimensions, weight, ease in adjusting, safe and secure, durability, easy to use, comfort and effectiveness. The section concerning service includes satisfaction over 4 items; service delivery program, repair and servicing, quality of professional service and follow-up. A Swedish version of QUEST 2.0 has been used in studies which were available for the authors and there was subsequently no need for translation (18). Previous studies have documented the QUEST 2.0 to be valid and reliable (17, 19, 20).

## Data analysis

Total score, total score device and total score service for each subject was calculated manually using the QUEST 2.0 manual (21). Means, medians, standard deviations (SD) and frequency of item responses were calculated using IBM SPSS Statistics 21. Sub-groups divided by gender were used when comparing mean age and average years of usage. Sub-groups divided by type of assistive device (Prosthesis/Orthosis) were used when comparing mean age, average years of usage, Total score, Total score device, Total score service, Item-by-item analysis of QUEST 2.0 and item analysis of mobility scores. Ratings ranging from 1-5 in the QUEST items were recoded into two variables. Ratings "Not satisfied at all", "Not very satisfied" and "More or less satisfied" (1, 2 and 3) were recoded into one variable for each item of QUEST. "Quite satisfied" and "Very satisfied" (4 and 5) were also recoded into one variable for each item of QUEST 2.0. Shapiro-Wilks tests were used to determine if data was normally distributed. Data was normally distributed if P-values were higher than 0.05. Independent t-test and Mann-whitney U test were used when analyzing significant differences between sub-groups regarding gender, type of assistive device, age, years of usage, total

scores and items from QUEST 2.0 and mobility questionnaire. P-values equal to 0.05 or less were considered as statistically significant.

### **Ethical consideration**

Patients were informed that their participation in the study was fully optional and that they were free to leave the study at any time and skip any questions with no given reason, without it impacting their treatment in any way. They were informed about the aim of the study and how it would be presented. Written individual informed consent was obtained from the participants (Appendix C). Participants were told that no kind of information were to be withheld from them. They were informed that no personal information would be obtained apart from age, gender and type of device. Their answers were to be anonymously and they would not be able to be identified in any publication resulting from the study. With the help of the P&O facilities at hand, any potential cultural or non-cultural issues that would arise were discussed and taken into consideration.

## Results

The mean age of women and men were 57 (SD 14) and 59 (SD 17) years respectively. Average years of usage for men were 10 (SD 12) years and women 8 (SD 7) years. The mean age of prosthetic and orthotic users were 63 (SD 17) and 55 (14) years respectively. Average years of usage for prosthetic users were 6 (SD 6) years and orthotic users 12 (SD 12) years. No statistically significant differences regarding age ( $P=0.793$ ) and years of usage ( $P=1.000$ ) were found between men and women, or between prosthetic and orthotic users ( $P=0.223$ ,  $P=0,213$  respectively). There were no statistically significant differences regarding gender of the participating subjects ( $P=0.469$ ).

## QUEST 2.0 – Patient satisfaction

Results from QUEST 2.0 are presented in Table 2. The results showed that patients were quite satisfied with their assistive device and service. The mean score for satisfaction of assistive device was 4.0 (SD 0.8) and 4.2 (SD 1.0) for satisfaction of service. The total mean score for satisfaction of both assistive device and service was 4.1 (SD 0.8). Although the mean score differed between prosthetic users and orthotic users in both satisfaction with assistive device and satisfaction with service, no statistically significant differences were found between the prosthetic and orthotic groups regarding the total score of QUEST 2.0 ( $p=0.476$ ), total score of satisfaction with assistive device ( $p=0.618$ ) and total score of satisfaction with service ( $p=0.420$ ).

Table 2. Results of patients level of satisfaction of assistive device and service

Response scale 1-5	N	Mean (SD*)
<b>Satisfaction assistive device</b>		
Q1. How satisfied are you with the dimensions of your assistive device?	21	4,1 (0,9)
Q2. How satisfied are you with the weight of your assistive device?	21	4,3 (0,7)
Q3. How satisfied are you with the ease in adjusting the parts of your assistive device?	18	3,4 (1,4)
Q4. How satisfied are you with how safe and secure your assistive device is?	21	4,1 (0,9)
Q5. How satisfied are you with the durability of your assistive device?	21	4,1 (1,0)
Q6. How satisfied are you with how easy it is to use your assistive device?	21	4,2 (0,9)
Q7. How satisfied are you with how comfortable your assistive device is?	20	3,7 (1,2)
Q8. How satisfied are you with how effective your assistive device is (the degree to which your assistive device meets your needs?)	21	4,1 (1,2)
<b>Total score assistive device</b>	21	<b>4,0 (0,8)</b>
- Prosthetic users	9	<b>4,1 (0,7)</b>
- Orthotic users	12	<b>3,9 (0,8)</b>
<b>Satisfaction services</b>		
Q9. How satisfied are you with the service delivery program in which you obtain your assistive device?	21	4,1 (1,2)
Q10. How satisfied are you with the repairs and servicing provided for your assistive device?	19	4,2 (1,0)
Q11. How satisfied are you with the quality of the professional services you received for using your assistive device?	21	4,3 (0,9)
Q12. How satisfied are you with the follow-up services received for your assistive device?	21	4,3 (1,0)
<b>Total score services</b>	21	<b>4,2 (1,0)</b>
- Prosthetic users	9	<b>4,4 (0,8)</b>
- Orthotic users	12	<b>4,0 (1,1)</b>
<b>Total score assistive device and service</b>	21	<b>4,1 (0,8)</b>
- Prosthetic users	9	<b>4,2 (0,7)</b>
- Orthotic users	12	<b>4,0 (0,8)</b>

\*SD: standard deviation

Although the total mean score showed that patients were quite satisfied with their assistive device and service, the mean score differed among items. Patients were least satisfied with the ease in adjusting their device with a mean score of 3.4 (SD 1.4) and comfortableness of the device with a mean score of 3.7 (SD 1.2). Patients were most satisfied with the weight of the assistive device, quality of service received and follow-up services received as the 3 items had a mean score of 4.3 (SD 0.7), 4.3 (SD 0.9) and 4.3 (SD 1.0) respectively. The most important items according to the patients are presented in Table 3. Out of the 12 items in satisfaction of assistive device and service, the patients viewed effectiveness of assistive device (19%), ease in using the assistive device (17%) and comfort of the assistive device (14%) as the 3 most important items. Patients viewed service delivery (0%), dimension of the assistive device (2%) and professional service (2%) as the least important out of the 12 items.

Table 3. The most important items in QUEST 2.0

Importance of items according to the patients	QUEST 2.0 items *	The most important items n = 51 (%)
1	Effectiveness, Q8	10 (19)
2	Easy to use, Q6	9 (17)
3	Comfort, Q7	7 (14)
4	Safety, Q4	6 (12)
5	Repairs and servicing, Q10	6 (12)
6	Durability, Q5	5 (10)
7	Follow-up, Q12	2 (4)
8	Ease in adjusting, Q3	2 (4)
9	Weight, Q2	2 (4)
10	Professional service, Q11	1 (2)
11	Dimensions, Q1	1 (2)
12	Service delivery, Q9	0 (0)

\* Patients chose the most 3 important QUEST 2.0 items

### Satisfaction subgroups

Table 4 presents an item-by-item analysis of subgroup answers in percentages. Marked results represent highlights according to the QUEST 2.0 manual (21). The item from QUEST 2.0 that patients were least satisfied with (Q3 - ease in adjusting) did not differ between prosthetic and orthotic patients. In each subgroup, 56 % of the subjects rated this item as “more or less satisfied” or less. Some of the items in the item-by-item analysis demonstrated percentage gaps when comparing the rating of satisfaction by the subgroups. A 13 percentage gap was found regarding satisfaction with comfort of assistive device, but this did not prove to be a statistically significant difference (P=0.592). When comparing satisfaction ratings between subgroups regarding satisfaction with effectiveness of assistive device and service delivery, a 20 percentage gap was found but did not prove to be a statistically significant difference (P=0.361, P=0.361 respectively). The biggest percentage difference between the subgroups was found on satisfaction with follow-up services. 33 % of the subjects in the orthotic group rated satisfaction with follow-up service as “More or less satisfied” or less, compared to 0 % of the subjects in the prosthetic group. The difference between the subgroups on satisfaction with follow-up services was not found to be statistically significant (P=0.06). No other differences between subgroups in the item-by-item analysis were found to be statistically significant.

Table 4. QUEST 2.0 Item-by-item analysis

Items	Prosthetics (n=9)		Orthotics (n=12)	
	% subjects	% subjects	% subjects	% subjects
	“More or less satisfied” or less (scores 1,2,3)	“Quite satisfied” or “Very satisfied” (scores 4,5)	“More or less satisfied” or less (scores 1,2,3)	“Quite satisfied” or “Very satisfied” (scores 4,5)
1. Dimensions	22	78	33	67
2. Weight	22	78	8	92
3. Ease in adjusting	56	44	56 <sup>b)</sup>	44 <sup>b)</sup>
4. Safety	22	78	33	67
5. Durability	22	78	33	67
6. Easy to use	22	78	17	83
7. Comfort	37 <sup>a)</sup>	63 <sup>a)</sup>	50	50
8. Effectiveness	22	78	42	58
9. Service delivery	22	78	42	58
10. Repairs and servicing	22	78	30 <sup>c)</sup>	70 <sup>c)</sup>
11. Professional service	22	78	33	67
12. Follow-up	0	100	33	67

<sup>a)</sup> One patient did not answer the item

<sup>b)</sup> Three patients did not answer the item

<sup>c)</sup> Two patients did not answer the item

## Mobility

Table 5 presents mobility item responses by all participants, prosthetic users and orthotic users. 19% of the overall subjects reported that they could walk 1 km or more without the assistive device. 56% of the prosthetic subjects reported that they could not walk at all without the use of assistive device. One subject in this group reported ability to walk 1 km or more without assistive device. 17% of the orthotic subjects reported no ability to walk without assistive device. No statistically significant difference between sub-groups were found in this item ( $P=0.09$ ). 62% of the overall subjects reported that they could walk 1 km or more with the use of their assistive device. Of the prosthetic and orthotic subjects, 67% and 59% reported that they could walk 1 km or more with the use of their assistive device respectively.

Subjects reported difficulties with the ability to walk on uneven ground, walk up and down a hill and walk on stairs with their assistive device. 70% of the overall subjects reported difficulties with walking on uneven ground, 57% reported difficulties with walking up and down a hill and walking on stairs. Between the sub-groups, 67% of the orthotic patients and 44% of the prosthetic subjects reported difficulties with walking on stairs ( $P=0.431$ ). Prosthetic subjects reported more difficulties

with walking up and down a hill than the orthotic subjects (67% and 50% respectively), though this was not statistically significant ( $P=0,478$ ).

44% of the prosthetic patients reported difficulties with the ability to get in and out of a bus in contrast to orthotic patients with 25% reporting difficulties on the same item. No statistically significant difference were found between sub-groups of this item ( $P=0,393$ ). 86% of the overall subjects reported possibility to access the workshop.

Table 5. Mobility for prosthetic and orthotic patients

	<b>n (%)</b>	<b>Prosthetics n (%)</b>	<b>Orthotics n (%)</b>
<b>Walking distance without assistive device</b>	21 (100)	9 (100)	12 (100)
- Not at all, 0 m	7 (33)	5 (56)	2 (17)
- A few meters	6 (29)	2 (22)	4 (33)
- Approximately 100 meters	4 (19)	1 (11)	3 (25)
- Approximately 1 km or more	4 (19)	1 (11)	3 (25)
<b>Walking distance with assistive device</b>	21 (100)	9 (100)	12 (100)
- A few meters	2 (9)	1 (11)	1 (8)
- Approximately 100 meters	6 (29)	2 (22)	4 (33)
- Approximately 1 km or more	13 (62)	6 (67)	7 (59)
<b>Ability to rise from a chair?</b>	21 (100)	9 (100)	12 (100)
- Yes, without any difficulty	15 (71)	7 (78)	8 (67)
- Yes, with difficulty	5 (24)	2 (22)	3 (25)
- Not applicable	1 (5)	-	1 (8)
<b>Ability to move around in my home?</b>	21 (100)	9 (100)	12 (100)
- Yes, without any difficulty	12 (57)	6 (67)	6 (50)
- Yes, with difficulty	6 (29)	3 (33)	3 (25)
- No, not at all	2 (9)	-	2 (17)
- Not applicable	1 (5)	-	1 (8)
<b>Ability to walk on uneven ground?</b>	20 (100)	9 (100)	11 (100) <sup>a)</sup>
- Yes, without any difficulty	6 (30)	3 (33)	3 (27)
- Yes, with difficulty	9 (45)	4 (45)	5 (46)
- No, not at all	5 (25)	2 (22)	3 (27)
<b>Ability to walk up and down a hill?</b>	21 (100)	9 (100)	12 (100)
- Yes, without any difficulty	9 (43)	3 (33)	6 (50)
- Yes, with difficulty	10 (48)	5 (56)	5 (42)
- No, not at all	2 (9)	1 (11)	1 (8)
<b>Ability to walk on stairs?</b>	21 (100)	9 (100)	12 (100)
- Yes, without any difficulty	9 (43)	5 (56)	4 (33)
- Yes, with difficulty	10 (48)	3 (33)	7 (59)
- No, not at all	2 (9)	1 (11)	1 (8)
<b>Ability to get in and out of a car?</b>	21 (100)	9 (100)	12 (100)
- Yes, without any difficulty	14 (67)	6 (67)	8 (67)
- Yes, with difficulty	6 (28)	3 (33)	3 (25)
- No, not at all	1 (5)	-	1 (8)
<b>Ability to get in and out of a bus?</b>	21 (100)	9 (100)	12 (100)
- Yes, without any difficulty	14 (67)	5 (56)	9 (75)
- Yes, with difficulty	5 (24)	3 (33)	2 (17)
- No, not at all	2 (9)	1 (11)	1 (8)
<b>I have the possibility to access the workshop?</b>	21 (100)	9 (100)	12 (100)
- Completely true	18 (86)	8 (89)	10 (84)
- Sometimes true	2 (9)	1 (11)	1 (8)
- Completely false	1 (5)	-	1 (8)

<sup>a)</sup> One subject did not answer the item

## Discussion

The results in this study demonstrate that patients were quite satisfied with their assistive device as well as the service provided by the P&O clinics. The majority of patients (86%) in this study totally agreed with the concept that they had easy access to the clinic based on availability, transport, distance and cost. The percentage is higher than results from previous studies in developing countries (29% & 59%) where availability, distance and travel cost were common barriers for patients who were in need of appointments for different reasons (2, 3). The results in this study could be interpreted as good results as it means that patients experience no problem with coming in for their treatment. At the same time it must be taken into account that the participants in this study were patients recruited at the clinic and we cannot be sure that these results reflect the entire population. We can easily see that patients in this study have benefitted from use of their device as the majority had problems walking more than a few meters without their device. When using their assistive device the majority reported that they could walk more than 100 meters. The majority also reported no problems in ability to move around in their home. The most problematic areas for the patients regarding mobility were walking on uneven ground (70%), walking up and down a hill (57%) and walking on stairs (57%). These results are in agreement with previously reported results in developing countries where the majority of the patients also reported difficulties in walking up and down a hill, walking on uneven ground and walking on stairs (2, 3). It is important to keep in mind that the accessibility for patients can differ between developed and developing countries. In more developed countries alternatives to stairs and hills are often found in the environment. This may not be the case for patients in developing countries where the accessibility for patients might be very poor. This may mean that these three problems can have a greater effect on satisfaction and mobility for patients living in developing countries compared to those in more developed countries.

### QUEST 2.0

Subjects reported that they were quite satisfied with the items in QUEST 2.0 with a total mean score of 4.1. They reported to be quite satisfied with assistive device (total mean score 4.0) and quite satisfied with service provided (total mean score 4.2). It is interesting to compare these results with previous studies conducted within the same area. Subjects completing the SERQUAL questionnaire in the study published by Bosman et al. scored an overall mean of 8.1 on a 1-10 scale regarding satisfaction with service provided in the Netherlands (5). This overall result is similar to the mean score regarding satisfaction of service presented in this study with both studies conducted in a developed country. Magnusson et al. showed in their study, conducted in the developing country Sierra-Leone, that subjects were quite satisfied with both assistive device and service provided from QUEST 2.0 (total mean score 3.7 respectively) (3). In their other study, Malawian subjects were reported to be quite, or very satisfied, with the assistive device and service provided (total mean score 3.9 and 4.4 on QUEST 2.0 respectively) (2). The results from this study, conducted in a developed country, and results from similar studies conducted in developing countries shows that patients rate their satisfaction with device and service as high. Subjects from both studies in Malawi and Sierra-Leone made comments regarding the lack of ability to pay for costs associated with service provision. None of the subjects in this study made comments regarding fees as a problem with service provision. It is interesting that subjects from the developing countries Malawi and Sierra-Leone showed similar results regarding satisfaction with service as subjects from this study, even though there are gaps with financial support between the countries. It is important to notice that the studies conducted in the Netherlands included 1364 subjects, Malawi included 83 subjects and the study in Sierra-Leone included 139 subjects (2, 3, 5). This study included only 21 subjects and because of the small group sample results might have looked different if a larger subject group would have been included.

Subjects in this study were least satisfied with the ease in adjusting their device and the comfortableness of their device. Results from previous studies by Magnusson et al. also demonstrated that patients rated their satisfaction regarding comfortableness with their device

among the lowest scores over the QUEST 2.0 device items (2, 3). With this in mind it is essential for a P&O facility to focus on improving patient satisfaction regarding comfortableness with their device. The results from this study which presented least satisfaction with ease in adjusting the device would be difficult to improve because of the fact that device adjustments are performed by a certified Prosthetist and Orthotist, and not by the patient. Areas of improvement with this item could possibly focus on orthotic strap strategies for easiness of tighten or loosen the assistive device as the patient does this by him/herself. For prostheses it is more difficult because of the fact that there are no direct adjustment possibilities which the patient is capable of, or should, do on their own behalf.

### **Most important items**

Subjects rated device effectiveness, easy to use and comfort as the three most important items on QUEST 2.0. Even though subjects rated satisfaction with device comfort as “quite satisfied”, focus from a P&O facility could concentrate on further improvement with this item as it is considered as an important item by patients. It was shown that subjects from the Magnusson et al. study in Sierra-Leone also rated device comfort as one of the three most important items in QUEST 2.0 (3). Even though subjects from these two particular studies rated this item as one of the three most important, results from the study by Magnusson et al. in Malawi showed that device comfort was rated as one of the three least important items by subjects (2). These findings suggest that results might look different depending on where the study is conducted, and it is not possible to draw conclusions over item importance by patients in a global perspective.

Results from both studies in Malawi and Sierra-Leone showed that subjects rated follow-up service (Q12) and access to repairs (Q10) as one of the three most important items in QUEST 2.0 (2, 3). Furthermore, findings from the study in Sierra-Leone suggested that there was an association between the ability to pay for costs with receiving services that contributed to service delivery satisfaction. This could be an explanation why subjects in the developing country rated follow-up service and access to repairs as two of the three most important items. It is interesting that these two items were not rated under the three most important items in this study conducted in a developed country. One explanation could be that, beside the limited entrance fee, health-care in Sweden is free and patients don't have to pay for i.e. device repairs or follow-up services. Patients visiting a P&O facility in Sweden might therefor take these items for granted and not rate them as high as other items.

### **Subgroups**

Percentage score for the prosthetic group in the item-by-item analysis showed that the majority of subjects were “quite satisfied” or “very satisfied” for all of the items in QUEST 2.0, except ease in adjusting device (Q3). The majority of the orthotic subjects were “quite satisfied” or “very satisfied” with 10 out of 12 items in QUEST 2.0. Though subjects from both groups presented high scores on the QUEST 2.0 items, there are some results from the item-by-item analysis that differ between groups. It is important to mention that there were no statistically significant differences between the prosthetic and orthotic group for any of the items in QUEST 2.0. The following section is a discussion of percentage differences between subgroups in the item-by-item analysis.

Percentage results show that subjects from the orthotic group and prosthetic group rated comfort of their device as one of the items they were least satisfied with. Half of the subjects in the orthotic group and approximately one third of the subjects in the prosthetic group rated this item as “More or less satisfied” or less. Results from both groups suggest that areas of improvement could be done for both prosthetic and orthotic subjects regarding device comfort. It is important to mention that one patient from the prosthetic group did not complete this item. Also, small group samples are presented for both groups which might have an effect for the overall results of the item-by-item analysis. In the item-by-item analysis, percentage differences showed that the orthotic group was less satisfied regarding effectiveness and service delivery compared to the prosthetic group. It is

difficult to draw any conclusions between the subgroups for these items for various reasons: the results showed no statistically significant differences between the subgroups, with this in mind the percentage difference might be because of chance and due to statistical power we can't be sure that the results are reliable. The follow-up item regarding service satisfaction was rated as "quite satisfied" or "very satisfied" by all of the prosthetic subjects. For the orthotic subjects, 33% rated this as "more or less satisfied" or less. Clinical experience suggests that focus on follow-up service is put on prosthetic subjects, especially within the first year post-amputation. A prospective study conducted in Sweden showed that prosthetic patients spent a median of 55 days at rehabilitation unit during a 5 year period (22). This might explain why all of the prosthetic subjects were quite or very satisfied with follow-up service provided. The majority of orthotic subjects were also shown to be quite or very satisfied with follow-up service provided by the P&O facilities. More important, analysis showed that there were no statistically significant differences between subgroups regarding satisfaction with follow-up service.

### **Study limitations**

Due to the study limitations it is hard to draw any conclusions from the results. The mean age of the sample group was relatively high and research has shown that there is an association between age and satisfaction as the older a patient was, the more satisfied they were with the country's healthcare system (23). As the English version of QUEST 2.0 is shown to be valid and reliable (19, 20), it is important to mention that the translated version to Swedish has not been tested for validity or reliability. The Swedish version has been used in a previous study and has been available at the Swedish Handicap institute (18). As the results showed no significant difference between the subgroups it can be interpreted as good results. Although due to the small sample size and a high standard deviation that followed, results may not be reliable. Percentagewise there is a difference between the subgroups on a couple of items but as previously mentioned, the small sample size makes it difficult to demonstrate a significant difference, if there is any at all.

### **Conclusion**

Overall this study demonstrates that the subjects were quite satisfied with their assistive device and the service received by the P&O clinic. The satisfaction level was in agreement with previous studies by Magnusson et al. in two developing countries (2, 3). No statistically significant differences regarding satisfaction with assistive device and service, or mobility, were found between prosthetic and orthotic subjects. Unfortunately we cannot be sure if the results reflect the entire population due to study limitations. The authors suggest that further research is necessary with larger sample sizes in order to demonstrate more reliable results.

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## Appendix A

### Mobilitet för protes och ortos patienter.

Hjälpmedel (endast ett): \_\_\_\_\_

Hjälpmedlets märke och modell (om känd): \_\_\_\_\_

Användarperiod av hjälpmedel (år): \_\_\_\_\_

Syftet med detta frågeformulär är att evaluera användarens mobilitet med deras nuvarande hjälpmedel. Frågeformuläret består av 10 situationer som kan uppstå i den vardagliga situationen.

- Vänligen sätt ett X framför det alternativ som stämmer bäst överens för dig.

---

### FRÅGEFORMULÄR

#### 1. Gångmöjlighet utan hjälpmedel

- Inte alls, 0 m
- Några få meter
- Ungefär 100 m
- Ungefär 1 km eller mer

#### 2. Gångmöjlighet med hjälpmedel

- Inte alls, 0 m
- Några få meter
- Ungefär 100 m
- Ungefär 1 km eller mer

#### 3. Förmåga att stiga upp från en stol med hjälpmedel

- Ja, utan svårigheter
- Ja, med svårigheter
- Nej, inte alls
- Icke applicerbart

#### 4. Förmåga att förflytta sig i huset med hjälpmedel

- Ja, utan svårigheter
- Ja, med svårigheter
- Nej, inte alls
- Icke applicerbart

5. Förmåga att gå på ojämn terräng med hjälpmedel

- Ja, utan svårigheter
- Ja, med svårigheter
- Nej, inte alls
- Icke applicerbart

6. Förmåga att gå i upp- och nedförsbacke med hjälpmedel

- Ja, utan svårigheter
- Ja, med svårigheter
- Nej, inte alls
- Icke applicerbart

7. Förmåga att gå i trappor med hjälpmedel

- Ja, utan svårigheter
- Ja, med svårigheter
- Nej, inte alls
- Icke applicerbart

8. Förmåga att gå in och ur en bil med hjälpmedel

- Ja, utan svårigheter
- Ja, med svårigheter
- Nej, inte alls
- Icke applicerbart

9. Förmåga att gå in och ur en buss med hjälpmedel

- Ja, utan svårigheter
- Ja, med svårigheter
- Nej, inte alls
- Icke applicerbart

10. Jag har tillgång till kliniken (transport, avstånd, kostnad, tillgänglighet) med hjälpmedel

- Överensstämmer helt
- Överensstämmer ibland
- Överensstämmer inte alls

## Appendix B

### Användarens tillfredsställelse med hjälpmedlen och hjälpmedelsservicen

#### QUEST-frågeformulär (version 2.0)

Hjälpmedel (endast ett): \_\_\_\_\_

Hjälpmedlets märke och modell (om känd): \_\_\_\_\_

\_\_\_\_\_

Användarens namn: \_\_\_\_\_

Datum: \_\_\_\_\_

Syftet med frågeformuläret är att få veta hur nöjd du är med ditt hjälpmedel och hjälpmedelsservicen. Frågeformuläret innehåller tolv frågor.

#### SVARSANVISNINGAR:

- Besvara varje fråga med hjälp av den nedanstående skalan med fem alternativ

1	2	3	4	5
Inte alls nöjd	Inte särskilt nöjd	Mer eller mindre nöjd	Ganska nöjd	Mycket nöjd

- I var och en av de tolv frågorna ringar du in **endast den siffra** som bäst beskriver din grad av tillfredsställelse.
- Besvara samtliga frågor som rör din situation. Svaren kan inte utnyttjas om formuläret innehåller alltför många obesvarade frågor.
- Efter varje fråga finns det utrymme för dig att berätta närmare om dina erfarenheter.

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1	2	3	4	5
Inte alls nöjd	Inte särskilt nöjd	Mer eller mindre nöjd	Ganska nöjd	Mycket nöjd

## HJÄLPMEDEL

Hur nöjd är du med...

1. dimensionerna (storlek, höjd, längd, bredd) på ditt hjälpmedel? <i>Berätta om dina erfarenheter:</i>	1 2 3 4 5
2. vikten på ditt hjälpmedel? <i>Berätta om dina erfarenheter:</i>	1 2 3 4 5
3. lättheten att ställa in och justera ditt hjälpmedel? <i>Berätta om dina erfarenheter:</i>	1 2 3 4 5
4. tryggheten och säkerheten hos ditt hjälpmedel? <i>Berätta om dina erfarenheter:</i>	1 2 3 4 5
5. hållbarheten och tåligheten hos ditt hjälpmedel? <i>Berätta om dina erfarenheter:</i>	1 2 3 4 5
6. hur lätt det är att använda ditt hjälpmedel? <i>Berätta om dina erfarenheter:</i>	1 2 3 4 5
7. bekvämligheten och behagligheten hos ditt hjälpmedel? <i>Berätta om dina erfarenheter:</i>	1 2 3 4 5
8. ändamålsenligheten hos ditt hjälpmedel (hur bra motsvarar hjälpmedlet dina behov)? <i>Berätta om dina erfarenheter:</i>	1 2 3 4 5

L. Demers, R. Weiss-Lambrou & B. Ska, 2000. Svensk översättning, K. Samuelsson, Universitetssjukhuset i Linköping, 2000.  
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1	2	3	4	5
Inte alls nöjd	Inte särskilt nöjd	Mer eller mindre nöjd	Ganska nöjd	Mycket nöjd

## HJÄLPMEDELSSERVICE

Hur nöjd är du med...

9. processen att ta i bruk ditt hjälpmedel (behandlingen av ärendet, leveransen av hjälpmedlet, hur lång tid tog det)? <i>Berätta om dina erfarenheter:</i>	1 2 3 4 5
10. den tekniska servicen och reparationen av ditt hjälpmedel? <i>Berätta om dina erfarenheter:</i>	1 2 3 4 5
11. de instruktioner om hjälpmedlet som yrkespersonerna givit (information, bruksanvisningar, kundvänlighet)? <i>Berätta om dina erfarenheter:</i>	1 2 3 4 5
12. det stöd som givits efter att du börjat använda hjälpmedlet? <i>Berätta om dina erfarenheter:</i>	1 2 3 4 5

- I den nedanstående tabellen räknas de ovanstående tolv aspekterna upp. Ringa in de tre aspekter du anser är de viktigaste!

- |                          |                              |
|--------------------------|------------------------------|
| 1. Dimensioner           | 7. Bekvämlighet              |
| 2. Vikt                  | 8. Ändamålsenlighet          |
| 3. Justering             | 9. Processen med ibruktandet |
| 4. Trygghet och säkerhet | 10. Service och reparation   |
| 5. Hållbarhet            | 11. Instruktioner            |
| 6. Användbarhet          | 12. Stöd efter ibruktandet   |

Tack för att Du fyllde i QUEST-frågeformuläret!

L. Demers, R. Weils-Lambrou & B. Ska, 2000. Svensk översättning, K. Samuelsson, Universitetssjukhuset i Linköping, 2000.  
Finsk översättning Stakes, 2005. Svensk översättning Johnny Holmström, Borgå stad, 2005.

## QUEST-poängsättningsformulär

Denna sida används för att beräkna resultatet av dina svar.

**SKRIV INTE PÅ DENNA SIDA!**

✓ **ANTAL OGILTIGA SVAR TOTALT**  
(hela formuläret förkastas om sex eller flera svar är ogiltiga)

✓ **Antal ogiltiga svar i kategorin hjälpmedel**  
(kategorin förkastas om tre eller flera svar är ogiltiga)

✓ **Poäng i kategorin hjälpmedel**  
(summera poängen i frågorna 1–8 och dividera summan med antalet giltiga svar i denna kategori)

✓ **Antal ogiltiga svar i kategorin hjälpmedelsservice**  
(kategorin förkastas om två eller flera svar är ogiltiga)

✓ **Poäng i kategorin hjälpmedelsservice**  
(summera poängen i frågorna 9–12 och dividera summan med antalet giltiga svar i denna kategori)

✓ **POÄNGANTAL TOTALT**  
(summera poängen i frågorna 1–12 och dividera summan med det totala antalet giltiga svar i enkäten)

De tre viktigaste aspekterna av tillfredsställelse:


## Appendix C

# Informerande samtycke till deltagande av enkätundersökning

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Du har blivit tillfrågad att delta i en enkätundersökning angående din nöjdhet över ditt hjälpmedel och service, samt din syn på din mobilitet i den vardagliga situationen. Vi samlar in data för att sammanställa detta i ett examensarbete som presenteras i juni månad 2016 i Jönköping.

Ditt deltagande är viktigt för att utvärdera patientnöjdhet och upptäcka eventuella förbättringsområden gällande patientservice inom den ortopedtekniska verksamheten och samverkande professioner.

Ditt deltagande i undersökningen är frivilligt. Du behöver inte svara på några frågor du inte vill svara på, och du kan avbryta ditt deltagande vid vilken tidpunkt som helst under ifyllnadsprocessen av enkätundersökningarna.

Din information är konfidentiell, och du kommer att vara anonym genom hela analysprocessen samt vid presentationstillfällen.

Vänligen fyll i nedan om du samtycker till deltagande i undersökningen

\_\_\_\_\_ Jag är införstådd med ovan information och väljer att delta i undersökningen.

\_\_\_\_\_ Jag är införstådd med ovan information och väljer att EJ delta i undersökningen.

Datum: \_\_\_\_\_

Ålder: \_\_\_\_\_      Kön:     Kvinna     Man     Ospecificerat

### Undersökare

Robert Westergren  
Ortopedingenjörstudent  
Hälsö högskolan, Jönköping

Mehdi Nasser  
Ortopedingenjörstudent  
Hälsö högskolan, Jönköping