Patients with Lower Limb Amputation in Vietnam

A quantitative study on Patients’ Satisfaction with their given Prosthetic Device and Service
Abstract

**Aim:** The aim of this thesis is to evaluate patients’ satisfaction with prosthetic device and service on lower limb amputations in Danang, Vietnam and to implement comparisons between the subgroups gender, living area, amputation cause and level.

**Method:** A cross-sectional study design was conducted using the Quebec User Evaluation of Satisfaction with assistive Technology (QUEST) 2.0 questionnaire to measure patients’ satisfaction. Fifty patients were recruited through the International Committee of the Red Cross (ICRC) and the data collection was performed in the patients own homes with an interpreter. The collected data was statistically analyzed with suitable tests using Statistical Package for the Social Sciences (SPSS).

**Result:** The patients were quite satisfied with their prosthetic devices (mean 4.16 SD ± 0.561) and more or less satisfied with their given services (mean 2.83 SD ± 1.213). Significant differences were found between genders regarding the patients’ satisfaction with prosthetic device. There were no significant differences between the remaining subgroups; living area, amputation cause and amputation level.

**Conclusion:** This thesis demonstrates that the patients in Danang appear to be quite satisfied with their prosthetic device, even though they reported problems with the durability of the device. Furthermore, the patients were more or less satisfied with their prosthetic services. The findings in this thesis also reveals that women were less satisfied compared to men regarding the prosthetic device. These conclusions should however be taken with caution, since the reliability and validity was lower than desired and it’s difficult to generalize the results to the population.

**Keywords:** patients’ satisfaction, QUEST 2.0, Vietnam, developing country, prosthetic device, lower limb amputation.
Patienter med nedre extremitetsamputationer i Vietnam

– En kvantitativ studie på patienters nöjdhet med deras utgivna protes och service

Sammanfattning

Syfte: Syftet med denna studie är att evaluerat patienters nöjdhet med deras utgivna protes och service på nedre extremitetsamputerade i Danang, Vietnam och att implementera jämförelser mellan subgrupperna kön, bostadsområde, amputations orsak och nivå.

Metod: En cross-sectional studiedesign blev utförd genom användning av Quebec User Evaluation of Satisfaction with assistive Technology (QUEST) 2.0 enkäten för att mäta patienters nöjdhet. Femtiotio patienter blev rekryterade genom International Committee of the Red Cross (ICRC) och datainsamlingen blev utförd i patienternas egna hushåll med en tolk. Den insamlade datan blev statistiskt analyserad med lämpliga tester genom användning av Statistical Package for the Social Sciences (SPSS).

Resultat: Patienterna var ganska nöjda med deras utgivna proteser (medelvärde 4,16 SD ± 0,561) och mer eller mindre nöjda med deras utgivna service (medelvärde 2,83 SD ± 1,213). Signifikanta skillnader hittades mellan kön gällande patienters nöjdhet med deras utgivna protes. Det fanns inga signifikanta skillnader mellan de resterande subgrupperna; bostadsområde, amputationsorsak och amputationsnivå.

Slutsats: Den här studien demonstrerar att patienterna i Danang verkar vara ganska nöjda med deras utgivna proteser, fastän de rapporterade problem med protesens hållbarhet. Dessutom var patienterna mer eller mindre nöjda med deras utgivna service. Fynden i denna studie påvisar också att kvinnorna var mindre nöjda gällande protesen jämfört med männen. Dessa slutsatser skall dock tas med aktsamhet, eftersom reliabiliteten och validiteten blev lägre än önskat och det var svårt att generalisera resultaten till populationen.

Nyckelord: patienters nöjdhet, QUEST 2.0, Vietnam, utvecklingsland, protes, nedre extremitetsamputation.
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### Abbreviations

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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>CIOMS</td>
<td>The Council for International Organizations of Medical Sciences</td>
</tr>
<tr>
<td>DFID</td>
<td>Department for International Development</td>
</tr>
<tr>
<td>ICRC</td>
<td>International Committee of the Red Cross</td>
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<tr>
<td>ILO</td>
<td>International Labour Organization</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental Organization</td>
</tr>
<tr>
<td>POF</td>
<td>Prosthetic Outreach Foundation</td>
</tr>
<tr>
<td>QUEST</td>
<td>Quebec User Evaluation of Satisfaction with assistive Technology</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
</tr>
<tr>
<td>TF</td>
<td>Transfemoral</td>
</tr>
<tr>
<td>TT</td>
<td>Transtibial</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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Introduction

A major problem in Vietnam is the current traffic situation, remaining of landmines and the effects of the war (Fisk, Söderberg, Trebbin, Cochrane & Stills, 2010; Day, 1996). This results in a high level of injuries involving amputations and other disabilities in the country, which increases the need of prosthetic devices and services. According to Day (1996) there are 200,000 amputees estimated in Vietnam 1996, and is increasing by 3-4% per year. The amputees in developing countries generally tend to get ignored by health care providers, which affect the service quality for the patients (Andaleeb, 2001). Therefore, it would be interesting to evaluate patients’ satisfaction with their prosthetic device and service. It is also clinically important to evaluate the satisfaction on amputees’ prosthetic device and service (Demers, Wessels, Weiss-Lambrou, Ska & De Witte, 1999; Demers, Monette, Lapierre, Arnold & Wolfson, 2002). This could improve and develop the prosthetic devices and services in Vietnam, which would make the amputees use their prosthetic devices and decrease unnecessary costs of reoccurring health-related visits. Since Vietnam is a developing country with a high rate of amputees, it would be a great success for their healthcare and prosthetic services (Gallaudet University, 2016; Demers et al., 1999; Nielsen, Psonak & Kalter, 1989).

There are few studies made on patients’ satisfaction with prosthetic device and service, and indicates a serious insufficiency in academic research within the topic (Matsen, 1999; Steen Jensen, Nilsen & Zeffer, 2005; Magnusson, Ahlström, Ramstrand & Fransson, 2013; Borg, 2011). This specifies a significant clinical importance and relevance to make a study based on patients’ satisfaction with given prosthetic device and service in developing countries for future improvements in healthcare.

Background

Amputees in Vietnam

The Vietnamese people take their agriculture very seriously, and it is significantly important for the economy in Vietnam (Cervantes-Godoy & Dewbre, 2010). It’s of high importance for sustainable development and poverty reduction in the country. By getting amputated you can’t resume previous occupations such as farming in most cases without a prosthetic device (Matsen, 1999; Weerasinghe, Fonseka, Dharmaratne, Jayatilake & Gielen, 2015). The social acceptance isn’t easy either, especially in the amputee’s families where they could see them as a burden because of the occupational situation they are in. In Vietnam, the families of the
amputees are responsible to take care of them during hospitalization, which also affect the families’ economy since they need to be absent from work (International Labour Organization [ILO], 2013; Parnes et al., 2009; Matsen, 1999). Even after the hospitalization many amputees can’t go back to their previous occupations because of their restrictions, which make them vulnerable. Especially in the urban areas where people with disability get unemployed three times more than persons without disability.

Being an amputated woman gives them a greater disadvantage than amputated men in a developing society (Parnes et al., 2009; Department for International Development [DFID], 2000). They feel more ashamed of their disability due to gender discrimination and cultural aspects. The abuse rate towards these women is two to three times more than other women because of their disability. In developing countries women also have limited access to service (Magnusson et al., 2013). Therefore, it would be interesting to investigate potential differences between men and women regarding patients’ satisfaction with prosthetic device and service.

Providing prosthetics in Vietnam

There is a clear connection between health, poverty and disability which makes independence a very important factor for survival in developing countries (Parnes et al., 2009). Prosthetic devices can be a great access for person’s independent living and sometimes lifesaving. Even though prosthetic use is important, there are difficulties with providing these in developing countries (Cummings, 1996). Factors such as economic issues, time, material and distance to prosthetic and orthotic workshops could affect the patients’ prosthetic care. In Vietnam the costs for accommodation and transport can be twice as high compared to the price of a new prosthetic device (Day, 1996; O’Donnell, 2007). Since the patients often pay these costs for themselves it’s hard especially for those who live in rural areas and have a long distance to afford repairs and refitting of their prosthetic device. The patients living in rural areas have also higher poverty rate compared to those in the urban areas (Khan, 2001). Because of these factors, it is interesting to investigate if there are any differences between patients living in rural and urban areas regarding patients’ satisfaction with device and service.

There are only 31 governmental prosthetic and orthotic workshops and some small private ones in Vietnam (mostly in the bigger cities), which makes it even harder for the amputees’ living far away from the workshops to get a prosthetic device (Fisk et al., 2010; Matsen 1999). There is also a variation in the regions regarding number of year’s patients have to wait for their first government- provided prosthetic device, in some regions it can take up to 9
years (Matsen, 1999). Many patients have to wait a very long time to get their prosthetic device and therefore they built one on their own or borrow from someone else (Staats, 1996). Therefore, it would be clinically relevant and interesting to evaluate patients’ satisfaction with prosthetic device and service.

The governments in Vietnam often prioritize different amputees based on their amputation cause (Matsen, 1999). When you are a veteran from the Vietnamese war it often comes with privileges and a higher place in the hierarchy. Hence, it would also be interesting to investigate if there are any potential differences regarding satisfaction between war and other amputation causes.

Non-governmental organizations (NGO) are of great importance after the war in developing countries to provide rehabilitation for the amputees since there is an insufficiency of governmental support (Staats, 1996; Pearlman et al., 2008). Some examples of NGOs in Vietnam are: ICRC, Vietnam Assistance for the Handicapped (VNAH), Vietnam Veterans of America Foundation (VVAF), World Rehabilitation Fund (WRF) and Prosthetic Outreach Foundation (POF). The NGOs receive their funding from foreign countries such as Sweden, Norway and Germany.

The employed staff and the level of their education in different provision centers could influence fabrication and fitting techniques (Day, 1996). They often provide low tech solutions for the patients when choosing components due to economic expenses. Therefore, it would be interesting to investigate if the patients are satisfied with their prosthetic device and service. The prosthetic and orthotic staff could subsequently be enlightened about what improvements regarding patients satisfaction with given prosthetic device and service that can be done and it would be of clinical relevance (Bosmans, Geertzen & Dijkstra, 2009).

Development of QUEST

The Quebec User Evaluation of Satisfaction with assistive Technology (QUEST) is used to evaluate patient’s satisfaction with given assistive device and service. The first and experimental version of QUEST consisted of 24 variables (Demers et al., 1999). With this version it took 45 minutes for the researcher to administer an interview with the patient (Demers, Weiss-Lambrou, & Ska, 2000b). The developers of QUEST needed to shorten the questionnaire by finding the most important measurement variables and dimensions in the original version to achieve a more rapid and easier interview. This was conducted in the study made by Demers, Weiss-Lambrou and Ska (2000a) where it was shown that the fundamental structure of satisfaction is built by the two measurements variables “Device” and “Service”.

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The new developed QUEST 2.0 consists of 12 questions regarding satisfaction with given assistive device and service divided in two parts: Device and Service. The questionnaire is easy to use and can be applied to a wide range of assistive devices. It can also be used for international comparisons and takes approximately 10-15 minutes to administer (Demers, Weiss-Lambrou, & Ska, 2002). In a study conducted by 12 assistive technology experts, it was concluded that all of the 12 questions in QUEST 2.0 were relevant and important when they used the questionnaire on different assistive devices (Demers et al., 1999). Previous studies have also established that QUEST 2.0 is a reliable and validated assessment tool with a clinical relevance (Demers, Monette et al., 2002; Demers et al., 2000a; Wessels & De Witte, 2003). It is recommended to use QUEST 2.0, but it’s also suggested that further measurements regarding different categories of assistive devices shall be investigated in the future. Evaluation with questionnaires regarding patients’ satisfaction is important for quality improvement in the prosthetics and orthotics profession (Bosmans et al., 2009). This to discover if the patients’ satisfaction with prosthetic device and service are living up to their expectations and to see what variables they are less satisfied with.

Previous studies in Asia

Several studies have investigated patients’ satisfaction with their prosthetic and orthotic device and service on lower limb amputations in developing countries, but only four in Asia (Matsen, 1999; van Brakel, Poetsma, Thanh Tam & Verhoeff, 2010; Durham, Sychareun, Santisouk, & Chaleunvong, 2016; Ghoseiri & Bahramian, 2012). Two of these studies measures patients’ satisfaction in Vietnam (Matsen, 1999; van Brakel et al., 2010). Matsen (1999) measured patients satisfaction with interviews and a standarized questionnaire designed by the author and the POF on 83 amputees from different geographic locations in Vietnam. This study showed that 13% of the participants were dissatisfied with their prosthetic device and service. They used their prosthetic device for 12 hours per day in average and rated the prosthetic as quite comfortable. But they also concluded that the participants’ working environment has change due to the amputation. This was associated with the lack of an advanced rehabilitation process so the participant couldn’t proceed with their occupation.

Similar results on user satisfaction with prosthetic device and service were found in the study made by van Brakel et al. (2010) where they investigated 818 participants with a lower limb amputation. The study showed that 6.6% of the participants were dissatisfied with given prosthetic device and service and the prosthetic devices were used approximately 8 hours per
day. Dissatisfaction with the prosthetic devices could be explained by socket fit, replacement of prosthetics, suspension and foot component. The participants who were satisfied with their prosthetics used it twice as much compared to those who were dissatisfied. They also concluded that the environment played a big part in the use of the participants prosthetic devices, many of the participants lived in a tough environment which lead to a decrease in use. Those participants who had the possibility for a prosthetic replacement showed to be significantly more satisfied than those who didn’t have the possibility. Other factors that influenced user satisfaction were mobility and physical activity. The study also showed that transfemoral (TF) amputees used their prosthetic device less frequently compared to transtibial (TT) amputees. This was explained by poor alignment, socket fit and suspension on the TF prosthetic device.

Two studies have been found that measure user satisfaction in Laos and Iran (Durham et al., 2016; Ghoseiri & Bahramian, 2012). In Laos user satisfaction with prosthetic and orthotic device and service were investigated on 247 participants using QUEST 2.0 (Durham et al., 2016). The study was conducted in three provinces and showed that overall the participants were quite satisfied with their prosthetic and orthotic device and service. It was no significant difference between prosthetic and orthotic users, but there were significant differences between provinces and gender. The lack of follow-up visits and participants’ difficulties to use their prosthetic and orthotic devices were parameters that had a negative impact on satisfaction. By using QUEST 2.0 they concluded that comfort (35.3%) and effectiveness (38.3%) were the most important factors when using a device and these were also the major reasons for dissatisfaction. The most important factors regarding service were service delivery (63.9%), quality of the professional services (39.5%) and effectiveness in fulfilling the participants needs (38.8%).

Ghoseiri and Bahramian (2012) evaluated user satisfaction with prosthetic and orthotic device and service with the Orthotics Prosthetics Users’ Survey on 293 participants in Iran. Regarding device satisfaction, the appearance of the device resulted in low scores and fitting of the device resulted in high scores. The participants in this study felt that they were treated with respect and courtesy from the orthotic and prosthetic staff, therefore this was the highest score regarding service satisfaction. But they also felt that it wasn’t a good coordination between the orthotic and prosthetic staff and the remaining health care providers, therefore this factor was rated with the lowest scores. The participants also felt that they weren’t a part of decision making regarding their prosthetic and orthotic device and service and rated this with low scores.
Aim

The aim of this thesis is to evaluate patients’ satisfaction with given prosthetic device and service on lower limb amputations in Danang, Vietnam. Comparisons between gender, living area, amputation cause and level will be implemented to identify if there are any significant differences regarding patients’ satisfaction with given prosthetic device and service.

Main research question

The main research question regarding satisfaction with given prosthetic device and service for this thesis is:

- How satisfied are the patients with lower limb amputations in Danang?

Further research questions

Further research questions regarding satisfaction with given prosthetic device and service for this thesis are:

1) Are there differences between men and women?
2) Are there differences between rural and urban living areas?
3) Are there differences between war related and other amputation causes?
4) Are there differences between the amputation levels TT and TF?

Materials & Methods

Study design

This bachelor thesis is classified as an observational cross-sectional study (O3) where one or more subject groups are evaluated at one point in time (American Academy of Orthotists & Prosthetists, 2008; Mann, 2003). The thesis involves a convenience sample, which means that the patients were chosen depending on their availability during the data collection (Pruchno et al., 2008; Mathers, Fox & Hunn, 2007). It contains a descriptive and comparative study design and patients’ satisfaction with given prosthetic device and service was investigated through a quantitative based questionnaire.
Participants

Sixty participants with lower limb amputation were asked to take part of this thesis. Eight of these (7 men and 1 woman) were participating in a pilot study and two participants didn’t fulfill the inclusion criteria (Table 1), this lead to a total of fifty participants for the thesis. The distributions of gender were forty-two men (84%) and eight women (16%) with a mean age of 60 (range 18-83) years. Thirty-seven (74%) of all participants used a TT prosthetic device and thirteen (26%) a TF prosthetic device, the average years of usage was 34 (SD ± 14) years. The major amputation cause among the participants was war related (54%) and these were all men. The less frequently causes were landmine, congenital, disease, traffic- and work accident. For further information about participants’ socio-demographics, prosthetic characteristics and usage see table 2-3 below.

Table 1. Inclusion criteria

<table>
<thead>
<tr>
<th>Inclusion criteria</th>
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<tbody>
<tr>
<td>Lower limb amputation between Syme's and Hip Disarticulation level</td>
<td></td>
</tr>
<tr>
<td>Unilateral amputation</td>
<td></td>
</tr>
<tr>
<td>Over the age of 18</td>
<td></td>
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<tr>
<td>Adequate cognitive ability</td>
<td></td>
</tr>
<tr>
<td>Have used a prosthetic device for at least 1 year</td>
<td></td>
</tr>
<tr>
<td>Still a prosthetic user</td>
<td></td>
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</table>

Table 2. Participants Socio-demographics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n  (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>**Mean age ***</td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>62</td>
</tr>
<tr>
<td>Women</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>42 (84)</td>
</tr>
<tr>
<td>Women</td>
<td>8 (16)</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
</tr>
<tr>
<td>Working</td>
<td>24 (48)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>3 (6)</td>
</tr>
<tr>
<td>Retired</td>
<td>21 (42)</td>
</tr>
<tr>
<td>Student</td>
<td>2 (4)</td>
</tr>
<tr>
<td><strong>Living area</strong></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>7 (14)</td>
</tr>
<tr>
<td>Urban</td>
<td>43 (86)</td>
</tr>
</tbody>
</table>

n=number, %=percentage of group, *Years
### Table 3. Prosthetic characteristics and usage

<table>
<thead>
<tr>
<th>Amputation level/Prosthetic device</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT</td>
<td>37 (74)</td>
</tr>
<tr>
<td>TF</td>
<td>13 (26)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amputation cause</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>War</td>
<td>27 (54)</td>
</tr>
<tr>
<td>Landmine</td>
<td>14 (28)</td>
</tr>
<tr>
<td>Traffic accident</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Disease</td>
<td>5 (10)</td>
</tr>
<tr>
<td>Congenital</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Work accident</td>
<td>2 (4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average years using prosthetic device*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>36</td>
</tr>
<tr>
<td>Women</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hours prosthetic device is used per day</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 hours</td>
<td>0 (0)</td>
</tr>
<tr>
<td>4-6 hours</td>
<td>3 (6)</td>
</tr>
<tr>
<td>7-9 hours</td>
<td>1 (2)</td>
</tr>
<tr>
<td>10-12 hours</td>
<td>3 (6)</td>
</tr>
<tr>
<td>13-15 hours</td>
<td>5 (10)</td>
</tr>
<tr>
<td>&gt; 15 hours</td>
<td>38 (76)</td>
</tr>
</tbody>
</table>

*n=number, %=percentage of group, *Years

### Procedure

**Instruments**

The QUEST 2.0 (Appendix 1) and additional questions (Appendix 2) about participants’ socio-demographics, prosthetic characteristics and usage were used to address the thesis aim. The additional questions were designed and influenced by Kerstin Hagberg (2006) to cover participants’ background regarding age, occupation, living area, prosthetic use etc. QUEST 2.0 consists of 12 questions in total regarding patients’ satisfaction with assistive device and service (Demers et al., 2000b). Every question has a comment section for the participants to fill in additional information. There are 8 questions within the device section and 4 questions within the service section. All questions are scored with a 5-point scale where 1: Not satisfied at all; 2: Not very satisfied; 3: More or less satisfied; 4: Quite satisfied; 5: Very satisfied. Additionally to the 12 questions participants shall choose 3 items each that they consider is of most importance out of: Dimensions, Weight, Adjustments, Safety, Durability, Easy to use,
Comfort, Effectiveness, Service delivery, Repairs/servicing, Professional service and Follow-up services.

**Translation of questionnaires**
Two highly educated Vietnamese interpreters working at Danang University of Medical Technology and Pharmacy within the field of rehabilitation and knew the prosthetic and orthotic terms, translated the English version of consent form (Appendix 3), additional questions and QUEST 2.0 into Vietnamese. Permission was granted to translate the English version of QUEST 2.0 into Vietnamese from the developer of the questionnaire. Answers from the questionnaires were translated back from Vietnamese into English by the same interpreters.

**Data collection**
The participants were recruited in collaboration with the ICRC and approval was obtained from the organization to use their patients in this thesis. Two interpreters from Danang University of Medical Technology and Pharmacy were recruited for the data collection and didn’t have any attachment with the participants. The data collection of QUEST 2.0 was conducted with guidance from the QUEST manual (Demers et al., 2000b). Before the data collection the interpreters received an instruction sheet (Appendix 4) about how the translations should be performed and how the questionnaires should be administered. Hand-outs of the questionnaires took place at the participants’ own homes in a separate room, with an interpreter and one of the researchers. Each participant received following translated documents: 1) Consent form with information about the thesis aim; 2) Additional questions regarding socio-demographics, prosthetic characteristics and usage; 3) QUEST 2.0. Before starting with the questionnaires it was important that the participants read the consent form and signed it if agreeing with the participation. In some cases where the participant wasn’t able or didn’t want to read by themselves the consent form, additional questions and QUEST 2.0 was read to them by the interpreter. Some participants self-reported the questionnaires by themselves, and some wanted to verbally tell the answers to the researchers. If any questions occurred the interpreter translated these to the researchers for an explanation.

**Pilot study**
In advance a pilot study was established with eight participants, both the researchers and interpreters. This due to investigate: 1) the translated versions of questionnaires; 2) if any potential language barriers occurred between the researchers and interpreters; 3) if any specific questions in QUEST 2.0 needed more explanation than others; 4) if any of the
additional questions needed adjustments or further explanation; 5) if any other additional questions related to socio-demographics, prosthetic characteristics and usage was required; 6) if the instruction sheet was detailed enough and abided by the interpreters.

During the pilot study some errors occurred regarding the instruction sheet, additional questions and QUEST 2.0. The researchers needed to explain about the process to both interpreters during the pilot study, which indicated that the instruction sheet wasn’t detailed enough. This was adjusted with the interpreters for a better understanding of the process.

The thesis required further information about participants’ socio-demographics and prosthetic usage in the additional questions therefore two more questions were added. Some questions in QUEST 2.0 needed more explanations for the participants regarding; 1) Device: dimensions and effectiveness (question 1 & 8); 2) Service: service delivery and follow-up services (question 9 & 12). The researchers took these questions into consideration and were well prepared to explain them.

Data analysis

The collected data was statistically analyzed and coded with SPSS; IBM SPSS Statistics 21. This program also calculated mean values, standard deviations (SD), p-values and frequencies for evaluation and comparisons of the collected data. Descriptive statistics were used to summarize variables from participants’ socio-demographics, prosthetic characteristics and usage. For evaluation of the variables in QUEST 2.0, descriptive statistics was also conducted.

Patients’ satisfaction on the subscale scores and total quest score was summarized manually and evaluated with the QUEST 2.0 manual (Demers et al., 2000b). The frequency of the participants three most important items were calculated and analyzed manually by the researchers.

A Shapiro-Wilk’s test was used for all comparisons between the subgroups: gender, living area, amputation cause and level to investigate if the data was normally distributed. Independent t-test (two-sided) and Mann-Whitney U test (two-sided) were used when comparing age, years using a prosthetic device, the level of satisfaction on each subscale and total score between these subgroups. The level of significance (α) was set to 0.05 and p-values equal or lower were considered as a significant difference. Where it was shown significant differences in subscale and/or total score an Independent t-test (two-sided) and Mann-Whitney U test (two-sided) were used to determine on which QUEST 2.0 variables these differences were.
Content analysis

The comments from QUEST 2.0 were analyzed with a quantitative content analysis, which means that the qualitative comments got converted into numerical values to achieve quantitative data (Krippendorff, 2004; Neuendorf, 2002). The comments that were related to problems with prosthetic device and service according to the participants were counted, coded and sorted to the 12 items of QUEST 2.0. This was accomplished in a systematic way with guidelines from the guidebook by Neuendorf (2002).

Ethical considerations

The consent form was assembled by following the ethical guidelines from World Health Organization (n.d) for clinical studies. In the consent form the participants received information about the bachelor thesis aim and its relevance for amputees in Vietnam. If the participants thought that the researchers were from a NGO it would lead to false hopes, which the researchers wanted to avoid. Therefore it was important to assure that the participants understood that it was a bachelor thesis and not a NGO research. During participation the information in this thesis was kept anonymous and confidential. The participation was entirely voluntary and the participants had the right to withdraw at any time they chose. If they chose not to participate or withdraw, all of their rights were respected. A cognitive ability was substantial and important to make sure that the participants could make their own choice to participate or not. When deciding to participate, the participants’ written consent was obtained. The consent form declares that no benefits for the participants would be received when participating.

According to the Ethical principles in international research it is important with an equal approach between gender, culture, economics and ethnicity (Marshall, 2007; The Council for International Organizations of Medical Sciences [CIOMS], 2002). This has been taken in consideration by the researchers to prevent indifferent treatments between the participants and conduct a justified approach towards them.

For those participants that chose to get the consent form read to them, it was significantly important for ethical considerations to have educated interpreters that spoke the native language and understood the ethical principles.
Results

Evaluation of patients satisfaction with given prosthetic device and service from QUEST 2.0 will be presented followed by comparisons between the subgroups gender, living area, amputation cause and level.

Evaluation of satisfaction

Table 4 presents patients satisfaction with their given prosthetic device and service on each question in QUEST 2.0 among all the participants. The most satisfactory variables was “effective” with a mean score of 4.38 (SD ± 0.635) and “easy” with a mean score of 4.32 (SD ± 0.621). The least satisfactory variables was “follow-up services” with a mean score of 1.84 (SD ± 1.167) and “repairs and servicing” with a mean score of 2.58 (SD ± 1.703).

Table 4. Patients' satisfaction with given prosthetic device and service

<table>
<thead>
<tr>
<th>Prosthetic device</th>
<th>not satisfied at all n (%)</th>
<th>not very satisfied n (%)</th>
<th>more or less satisfied n (%)</th>
<th>quite satisfied n (%)</th>
<th>very satisfied n (%)</th>
<th>Mean score (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How satisfied are you with the <strong>dimensions</strong> (size, height, length, width) of your assistive device?</td>
<td>0 (0)</td>
<td>1 (2)</td>
<td>8 (16)</td>
<td>19 (38)</td>
<td>22 (44)</td>
<td>4.24 (0.797)</td>
</tr>
<tr>
<td>2. How satisfied are you with the <strong>weight</strong> of your assistive device?</td>
<td>0 (0)</td>
<td>4 (8)</td>
<td>11 (22)</td>
<td>18 (36)</td>
<td>17 (34)</td>
<td>3.96 (0.947)</td>
</tr>
<tr>
<td>3. How satisfied are you with the <strong>ease in adjusting</strong> (fixing, fastening) the parts of your assistive device?</td>
<td>0 (0)</td>
<td>1 (2)</td>
<td>5 (10)</td>
<td>24 (48)</td>
<td>20 (40)</td>
<td>4.26 (0.723)</td>
</tr>
<tr>
<td>4. How satisfied are you with how <strong>safe and secure</strong> your assistive device is?</td>
<td>0 (0)</td>
<td>2 (4)</td>
<td>5 (10)</td>
<td>27 (54)</td>
<td>16 (32)</td>
<td>4.14 (0.756)</td>
</tr>
<tr>
<td>5. How satisfied are you with the <strong>durability</strong> (endurance, resistance to wear) of your assistive device?</td>
<td>0 (0)</td>
<td>5 (10)</td>
<td>10 (20)</td>
<td>25 (50)</td>
<td>10 (20)</td>
<td>3.80 (0.881)</td>
</tr>
<tr>
<td>6. How satisfied are you with how <strong>easy</strong> it is to use your assistive device?</td>
<td>0 (0)</td>
<td>1 (2)</td>
<td>1 (2)</td>
<td>29 (58)</td>
<td>19 (38)</td>
<td>4.32 (0.621)</td>
</tr>
<tr>
<td>7. How satisfied are you with how <strong>comfortable</strong> your assistive device is?</td>
<td>1 (2)</td>
<td>1 (2)</td>
<td>5 (10)</td>
<td>25 (50)</td>
<td>18 (36)</td>
<td>4.16 (0.842)</td>
</tr>
</tbody>
</table>
Table 5. Mean scores on patients' satisfaction

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Mean</th>
<th>SD</th>
<th>Scores within M ± 1 SD</th>
<th>Min</th>
<th>Max</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device</td>
<td>4.16</td>
<td>0.561</td>
<td>3.60 to 4.72</td>
<td>2.88</td>
<td>5.00</td>
<td>2.13</td>
</tr>
<tr>
<td>Services</td>
<td>2.83</td>
<td>1.213</td>
<td>1.62 to 4.04</td>
<td>1.00</td>
<td>5.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Total</td>
<td>3.71</td>
<td>0.663</td>
<td>3.05 to 4.37</td>
<td>2.50</td>
<td>5.00</td>
<td>2.50</td>
</tr>
</tbody>
</table>

Response scale: 1) Not satisfied at all; 2) Not very satisfied; 3) More or less satisfied; 4) Quite satisfied; 5) Very satisfied (Demers et al., 2000b).
The frequency of patients’ most important satisfaction items and comments related to problems are presented in Table 6. Out of the twelve items from QUEST 2.0 the patients’ three most important items were “durability” (20%), “easy to use” (16%) and “comfort” (15%).

The majority of patients’ comments were related to problems with the QUEST item “durability” (24%). The patients reported mostly in the comments that the socket, suspension and especially the foot component of the prosthetic device easily broke. Furthermore, the patients commented to have problems related to “dimensions” (21%) and “weight” (17%). With the dimensions patients reported that the volume of the socket was too big and that the prosthetic leg was too long or short. The main reason that the patients reported problems with the weight was that their prosthetic leg was too heavy.

Table 6. Frequency of the most important satisfaction items and comments related to problems

<table>
<thead>
<tr>
<th>QUEST items</th>
<th>n (%) *</th>
<th>n (%) **</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durability</td>
<td>30 (20)</td>
<td>20 (24)</td>
</tr>
<tr>
<td>Easy to use</td>
<td>24 (16)</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Comfort</td>
<td>22 (15)</td>
<td>8 (10)</td>
</tr>
<tr>
<td>Safety</td>
<td>18 (12)</td>
<td>5 (6)</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>15 (10)</td>
<td>3 (4)</td>
</tr>
<tr>
<td>Weight</td>
<td>13 (9)</td>
<td>14 (17)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>11 (7)</td>
<td>17 (21)</td>
</tr>
<tr>
<td>Adjustments</td>
<td>9 (6)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Follow-up services</td>
<td>5 (3)</td>
<td>5 (6)</td>
</tr>
<tr>
<td>Repairs/Servicing</td>
<td>3 (2)</td>
<td>3 (4)</td>
</tr>
<tr>
<td>Service delivery</td>
<td>0 (0)</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Professional service</td>
<td>0 (0)</td>
<td>3 (4)</td>
</tr>
</tbody>
</table>

* n=150, patients were asked to choose 3 most important items  
** n=82, comments related to problems

Comparisons between subgroups

There were no significant differences regarding age and years using a prosthetic device between the subgroups gender, living area and amputation level. Concerning amputation causes there was a significant difference with age (p=0.000) and years using a prosthetic device (p=0.000). The veterans had higher mean age and average years of prosthetic usage compared to the other amputation causes.
Table 7 shows comparisons between subgroups and p-values on their subscale and total scores of QUEST 2.0. There were no significant differences found between rural and urban living areas, war and other amputation causes or TT and TF regarding the level of satisfaction with given prosthetic device and service. Nor were there any statistical differences on the total level of satisfaction (device and service combined) between these subgroups. There was a significant difference in level of satisfaction with prosthetic device (p=0.011) between men and women. Male patients showed to be more satisfied with a mean of 4.24 (SD ± 0.516) compared to the female patients with a mean of 3.70 (SD ± 0.605). Furthermore the level of satisfaction with the total quest score (device and service combined) and the prosthetic service between men and women showed no significant differences.

Table 7. Comparisons between subgroups subscale and total scores

<table>
<thead>
<tr>
<th></th>
<th>Satisfaction with device p-value</th>
<th>Satisfaction with service p-value</th>
<th>Satisfaction with device and service combined p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (Men; Women)</td>
<td>0.011*</td>
<td>0.284</td>
<td>0.459</td>
</tr>
<tr>
<td>Living area (Rural; Urban)</td>
<td>0.094</td>
<td>0.315</td>
<td>0.203</td>
</tr>
<tr>
<td>Amputation cause (War; Other)</td>
<td>0.148</td>
<td>0.590</td>
<td>0.288</td>
</tr>
<tr>
<td>Amputation level (TT; TF)</td>
<td>0.652</td>
<td>0.763</td>
<td>0.991</td>
</tr>
</tbody>
</table>

*There is a significant difference between the subgroups α=0.05

Table 8 shows that there are significant differences with level of satisfaction between men and women regarding following prosthetic device variables; “weight” (p=0.001), “ease in adjusting” (p=0.028) and “comfortable” (p=0.049). The women were less satisfied with the weight of the prosthetic device and had a mean score of 3.00 (SD ± 1.069) compared to the mean score for men 4.14 (SD ± 0.814). Regarding the ease in adjusting the prosthetic device, women were also less satisfied (mean 3.50 SD ± 0.926) compared to the men (mean 4.40 SD ± 0.587). The men were more satisfied with the comfort of the prosthetic device (mean 4.26 SD ± 0.767) compared to the women (mean 3.63 SD ± 1.061).

Table 8. Comparisons on satisfaction with prosthetic device between men and women

<table>
<thead>
<tr>
<th>Prosthetic device variables</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dimensions</td>
<td>0.427</td>
</tr>
<tr>
<td>2. Weight</td>
<td>0.001*</td>
</tr>
<tr>
<td>3. Ease in adjusting</td>
<td>0.028*</td>
</tr>
<tr>
<td>4. Safe and secure</td>
<td>0.112</td>
</tr>
<tr>
<td>5. Durability</td>
<td>0.863</td>
</tr>
<tr>
<td>6. Easy</td>
<td>0.354</td>
</tr>
</tbody>
</table>
*There is a significant difference between men and women
\[ \alpha=0.05 \]

Discussion

This discussion section will consist of a method and result discussion followed by limitations and advantages and future research. In the method section there will be discussions about issues regarding the implemented method. The result section will consist of a discussion about the main findings regarding evaluation of patients’ satisfaction with prosthetic device and service. This followed by a discussion about the findings in the comparisons between the subgroups. The reliability and validity will be generally discussed throughout the discussion section.

Method discussion

Study design

With a cross-sectional study design it’s a challenge for the researcher to retrieve an explanation of the results and when evaluation only exist at one point in time, data could differ if the evaluation was set in another time (Levin, 2006; Mann, 2003). But to achieve the opportunity to investigate multiple outcomes regarding patients’ satisfaction in a short amount of time and with a restricted budget, a cross-sectional study design with a questionnaire is recommended (Levin, 2006; Mann, 2003; Mathers et al., 2007). By using questionnaires in a study, it is a higher risk for having a low response rate (Mathers et al., 2007). The low response rates can cause unreliable results and the outcome can be criticized (Mann, 2003). This was prevented in the current thesis by using a hand out approach, which is recommended for achieving a higher response rate (Mathers et al., 2007). Conducting this current thesis with a questionnaire can lead to ethical benefits (Mann, 2003; Mathers et al., 2007). The patients will not be exposed or used in a treatment that can be unsafe or lead to that their treatment would be withhold compared to an experimental situation where this can occur.

Additional questions

As mention before in the background section, the QUEST 2.0 is a reliable and validated measurement tool (Demers, Monette et al., 2002; Wessels & De Witte, 2003). But a problem with the questionnaire is that it doesn’t contain information about participants’ socio-demographics, assistive device characteristics and usage (Samuelsson & Wressle, 2008).
Therefore, the additional questions were added. These are not validated but were influenced by Kerstin Hagberg (2006).

**Recruitment**

The participants were recruited from a NGO, but it was unknown for the researchers if the participants had received a prosthetic device and service from the government before the data collection of each participant. Therefore it is difficult to obtain a generalization of the result within NGOs because the participants could have received their prosthetic device and service from the government instead. In this thesis, the majority of the participants were men with a mean age of 62 and an amputation cause due to war, these socio-demographics and distributions are similar to those in the study made by van Brakel (2010). According to Matsen (1999) veterans often get prioritized by the governments, this could also indicate that most of the patients receiving service are veterans. For these reasons this thesis sample distribution could be representative to the general population of those who receive a prosthetic device and service weather it’s from a NGO or the government. However, the researchers didn’t have access to the registration system with detailed patient information nor the exact information about population distribution regarding amputees receiving prosthetic device and service in Vietnam. Therefore it is difficult to generalize the thesis results to the general population receiving a prosthetic device and service. Another aspect that affects the generalization is that it was a convenience sample used in this thesis, since the sample was determined by the availability from ICRC (Pruchno et al., 2008; Mathers et al., 2007). The researchers had the possibility to exclude patients among those that chose to participate, but didn’t have the possibility to select from all patients in the register from ICRC. This can lead to that a risk of bias occurs from the staff working at ICRC. They could have affected the results in a positive direction through recruiting the patients that they knew were satisfied with their prosthetic device and service.

**Sample**

A sample size of 50 participants is considered to be small which can affect the reliability and validity (Jackson, 2001). Compared to previous studies with a cross-sectional design the current thesis sample size is relatively smaller, which also indicates that the sample size might not be adequate (Magnusson et al., 2013; Magnusson, Ramstrand, Fransson & Ahlström, 2014; van Brakel et al., 2010). A small sample size would subsequently make it difficult to generalize the results to the population of the research (Harry & Lipsky, 2014; Thomson, 2011). But since this thesis was conducted in a limited time of period and with a restricted
economic budget, the sample size unfortunately got affected. A previous study indicates that a decrease of the sample size is a common consequence when conducting a study with these kinds of circumstances (Lenth, 2001).

The inclusion criteria were implemented to avoid patients who wasn’t appropriate to participate for the thesis, this to avoid that the results would go in an unwished direction. The researchers chose to only have unilateral amputees participating in the thesis, this because QUEST 2.0 had to be evaluated two times (one on each prosthetic device) if the patient were bilateral. If QUEST 2.0 had been evaluated two times on one person it could have affected the results since it is the same socio-demographics and possibly the same service on the two outcomes. To avoid a low response rate and subsequently achieve a more reliable result, the researchers aimed to have patients who had been using a prosthetic device for at least one year, so they would be able to answer all the questions in QUEST 2.0 (Mann, 2003).

When comparing the amputation causes, the researchers aimed to get an equal distribution between the subgroups. Therefore, a comparison between war and other amputation causes was implemented to get an equal distribution and a more reliable result (Brookes et al., 2004). This was also made since previous studies have concluded that veterans in Vietnam get prioritized by the governments in comparison to other amputees (Matsen, 1999; van Brakel, 2010). It was therefore interesting and clinical relevant to investigate and compare the current thesis result in this matter to see if this was accurate. But because the ICRC recruited the patients, the researchers couldn’t have any influence on the proportions of the other subgroups. Instead the proportions of subgroups were decided by the availability of patients, which can explain the small group sizes in these subgroups.

Translation process and data collection
Since a Vietnamese version of QUEST 2.0 doesn’t exist, the English version had to be translated into Vietnamese by the two interpreters. There was no study performed by the researchers to see if the Vietnamese version was validated. However, previous studies in other countries have also used this translation method of QUEST 2.0 where the questionnaire didn’t exist in the native language (Magnusson et al., 2013, 2014; Durham et al., 2016). Since the Vietnamese version of QUEST 2.0 wasn’t validated, the pilot study was implemented to decrease the risk of error sources that can occur regarding the translation of the questionnaire. The pilot study was also implemented to test the communication between the researchers and the interpreters during data collection, this to investigate if any potential language barriers occurred and to achieve a more reliable result.
Before the data collection the primary recruitment method was that the researchers should recruit the patients from Danang Rehabilitation and Orthopedic Hospital with one interpreter. But approval to do this was withdrawn when the data collection should’ve begun. This lead to a huge time limit with the data collection and therefore the ICRC was contacted to provide patients for this thesis. It also led to that the researchers had to make the data collection separately with one interpreter each to be able to collect as many patients as possible during the short amount of time. This method has its advantages and disadvantages. When looking at the total collected data it has been two interpreters involved. It is although recommended according to Wallin and Ahlström (2006) to have one interpreter during the data collection. The advantage of this is that it’s more likely that the interpreter gives the same interpretations regarding all types of communications, which increase the dependability and credibility of the data. However, using one interpreter can also lead to that the interpreter gets bored and tired, which can lead to a higher risk for the interpreter to summarize patients answers instead of giving the exact translation, which subsequently lead to a threat towards the validity (Kapborg & Berterö, 2002). Considering this and with the time limit with this thesis, it was a sustainable solution and substantial for the researchers to make the data collection separately and to have two interpreters so all the recruited patients could be a part of the thesis. This results in that the advantage of having one interpreter is lost, but as mentioned before it was the optimal solution at the time considering the thesis circumstances. Therefore it was significantly more important to prevent other error sources during data collection by aiming to have interpreters that spoke the native language and had the same culture as the patients. This because it would gain the patients trust and make them feel safe, significantly for ethical reasons but also for a more reliable and validated data collection (CIOMS, 2002; Kapborg & Berterö, 2002; Marshall, 2007; Tsai et al., 2004;). Furthermore the recruited interpreters had earlier experiences in interpreting, which were important to achieve trustworthiness with the data collection (Wallin & Ahlström, 2006). It was also beneficial to have interpreters that spoke English fluently and was familiar with the prosthetic and orthotic terms, since it made the translation process easier. The reliability can though decrease when the researchers don’t understand the Vietnamese language and a lack of full control over the data collection occurs. However, the whole translation process of working with interpreters during this thesis was necessary to be able to administer QUEST 2.0 in Vietnam.

During a data collection it is a risk that other people is influencing on the patients answers, this includes for example the interpreters and family members. To prevent this as much as possible, the data collection was established in the patient’s own home in a separate room.
with only the researcher, interpreter and patient. To assure that the interpreter didn’t influence on the patients’ answers the instruction sheet were established and the researchers made sure that this was abided and let the interpreter know when the instruction sheet wasn’t followed. It was considered that the researchers’ presence could affect the patients’ answers. This due to that the patients might think the researchers would provide them with a new prosthetic device, which could lead their answers in an undesirable direction. This would subsequently decrease the reliability of the collected data. Therefore during the data collection, the researchers made sure that the patients understood that they only were students to minimize this error source.

In developing countries, there are plenty of amputees not having the economy to travel far distances for healthcare (DFID, 2000; Matsen, 1999). Concerning the ethical considerations it is recommended to not let the patients put their own money for travel costs when participating in a research (CIOMS, 2002). For these economic issues and ethical considerations it was beneficial for the researchers to travel to the patients’ homes instead. Furthermore, the clinical environment has an impact on patients and if they aren’t accustomed it can make them feel uncomfortable and stressed (Fornara, Bonaiuto & Bonnes, 2006). Therefore, it was also an advantage that the hand-outs took place in the patients own homes to avoid this.

Statistical methods

When using a Shapiro-Wilk’s test it is acceptable to have a sample size of 50 to achieve an adequate power, in comparison to Kolmogorov-Smirnov, Lilliefors and Anderson-Darling tests, where it is required to have at least 100 in the sample size to achieve enough power (Razali & Wah, 2011). Therefore, a Shapiro-Wilk’s test was optimal to use in this thesis to achieve a high power and a more reliable result (Button et al., 2013; Razali & Wah, 2011). It’s hard to entirely avoid Type 1 and Type 2 errors in research, but the researchers aimed to collect as many patients as possible, since the more patients you have in a sample the more you minimize the risk of making these errors (Banerjee, Chitnis, Jadhav, Bhawalkar & Chaudhury, 2009).

Result discussion

Main research question

The results in this thesis shows that the patients were quite satisfied with their prosthetic devices and more or less satisfied with their given services, overall were they quite satisfied (device and service combined). Although the patients were quite satisfied with their prosthetic device, they still reported in the comments to have problems with the durability. They had
problems especially with that the foot component of their prosthetic devices easily broke. This might be explained by that the employed staff in developing countries often choose low tech solutions, due to a cheaper price (Day, 1996; Ghoseiri & Bahramian, 2012). Furthermore, the patients’ results showed that they were least satisfied with the follow-up services and repairs among all the variables in QUEST 2.0. This might be because the patients can’t afford the transport to the prosthetic workshop and accommodation costs to receive follow-ups and repairs, since amputees can have more economical difficulties because of their limitations (Cummings, 1996; ILO, 2013; Magnusson et al., 2013; Matsen, 1999). These results could be an indication to why the patients rated durability as the most important QUEST 2.0 item, since they might not need repairs and follow-up visits if the durability of the prosthetic device was optimal. The most common comments regarding problems with the durability was that the foot component easily broke, which also was a problem in the study made by van Brakel et al. (2010). This might also be a factor that contributes to choosing durability as the most important item, since the foot and ankle component decides the durability of the entire prosthetic device (Day, 1996). The majority of the patients rated the dimensions as “very satisfied” and durability as “quite satisfied” in QUEST 2.0, but these items had also most comments related to problems. This could indicate that the patients’ expectations might have had an influence on their answers with the satisfaction (Kark & Simmons, 2011). If the expectations were low it could explain the high rate of satisfaction with these items and could indicate that the problems with the prosthetic durability and dimensions wouldn’t have an impact on the patients’ satisfaction. The device subscale was relatively high, which also could indicate that the patients’ expectations influenced on more than just the durability and dimensions items. There were similar results on the device subscale score in previous studies who measured patients’ satisfaction using QUEST 2.0 in developing countries (Durham et al., 2016; Magnusson et al., 2013; Magnusson et al., 2014). But compared to these studies the results on the service subscale score in the current thesis were lower. In the study made by Magnusson et al. (2013) the researchers indicated that the high education of the staff could have affected the high rate on satisfaction with the services. However, in the current thesis it was hard to know where the patients got their prosthetic device provided and the education of the staff, since the researchers didn’t have access to patients’ information. Therefore, it could be a possibility that the patients have gotten their prosthetic device provided by a low educational staff, which might have resulted in a lower satisfaction with the service. Day (1996) indicates that education and training programs are usually an issue in developing countries and that a long term solution should be implemented to achieve a higher level of
prosthetic service. The amputees in developing countries also tend to get ignored by the healthcare providers which affect the given service quality (Andaleeb, 2001). This could be a reason for the lower rate on satisfaction with the service in the current thesis. Since there were a high percentage of the patients rating follow-up services as “not satisfied at all”, this could also have contributed to lower the service subscale score. It is important to have access to follow-up service, since the absence of this service can lead to that the patients stop using their prosthetic device (Durham et al., 2016; Weerasinghe et al., 2015). If the patients stop using their prosthetic device it will be difficult for them to proceed with their occupation and would affect their independent living (Parnes et al., 2009; Weerasinghe et al., 2015). This might lead to economic issues for the patient (ILO, 2013; Weerasinghe et al., 2015). If their previous occupation was farming it could also affect the economy of Vietnam, since farming is important for poverty reduction and sustainable development in the country (Cervantes-Godoy & Dewbre, 2010).

The results from the total QUEST 2.0 score (device and service combined) showed that patients were overall quite satisfied. However, the results from the current thesis should been taken with caution because the researchers don’t know if the patients received their prosthetic device and service for free. This could have had an impact on the patients’ answers, if they received the device and service for free, they might rate their satisfaction higher because they don’t want to be ungrateful (Durham et al., 2016). But if they had to pay their prosthetic device and service by themselves, their satisfaction might have went in a negative direction instead. The satisfaction with the prosthetic device and service could have also been affected by the patients’ expectations, healthcare standards, earlier experiences, current physical and mental condition (Kark & Simmons, 2011; Williams, 1994). This is important to take into consideration and highlight since it could have had an impact on these results. Previous studies indicate that it is also important to pay attention and to take every individuals need and wishes into consideration to maintain a high patient satisfaction (Geertzen, Gankema, Groothoff & Dijkstra, 2002; Steen Jensen et al., 2005). Besides patients’ satisfaction, this also concerns the human rights meaning that every individual shall be able to get an assistive device provided (Borg, Larsson & Östergren, 2011).

Further research questions
There was a significant difference between men and women regarding the device subscale score and the women were less satisfied. These results are similar to previous studies (Durham et al., 2016; Magnusson et al., 2014). The result in the current thesis could reflect
over that women in developing countries have difficulties with their disability in social contexts because they feel ashamed of their disability due to gender discrimination and cultural aspects (Gallagher, Desmond & MacLachlan, 2008; Parnes et al., 2009; DFID, 2000). Therefore, this could lead to that women might change their attitude towards their prosthetic device, which affects their satisfaction (Kark & Simmons, 2011). This could explain the differences regarding the device subscale score between men and women. The women were less satisfied compared to men with the “weight”, “ease in adjusting” and “comfort” of their prosthetic device, which indicates that the prosthetic device doesn’t fulfill the women’s requirements on these parameters. The previous study made by Durham et al. (2016) recommends that it is important to take differences between men and women into consideration and get a better understanding of women’s requirements with their prosthetic device. Furthermore, there were no significant difference between men and women regarding the overall satisfaction with the service subscale score or the total score (device and service combined) in QUEST 2.0. These results are interesting since women have limited access to service in developing countries (Magnusson et al., 2013). Hypothetical this could have an influence on the satisfaction with the service between men and women. But previous studies have also got the same results as in the current thesis (Magnusson et al., 2013; Magnusson et al., 2014). Magnusson et al. (2013) indicated that support from the women’s family and friends could have contributed to the high level of satisfaction and that no significant differences were found. This might have influenced the results in the current thesis as well, since families gives support and take care of the amputee in Vietnam (ILO, 2013; Parnes et al., 2009; Matsen, 1999).

Patients living in rural areas have a long distance to the workshops and limited access to service, they have also a higher poverty rate compared to those living in urban areas, which makes it difficult for them to pay the transport to the workshops and the accommodations (Day, 1996; Khan, 2001; Magnusson, 2013; O’Donnell, 2007). This might have had an influence on the patients’ satisfaction in the current thesis. However, there were no significant differences regarding device, service or total score in QUEST 2.0 between patients living in rural and urban areas. Similar results were found in the study made by Magnusson (2013), but in the study made by Durham et al. (2016) the results showed that patients living in rural areas were more satisfied than those living in urban areas. They indicated that patients living in rural areas would have lower expectations than those living in urban, which made them more satisfied. Since there were no significant differences in the current thesis, patients’
expectations might not have had as great impact as in the above mentioned study made by Durham et al. (2016).

There were no significant differences between war and other amputation causes, which is an interesting result since previous studies have indicated that veterans get prioritized within the healthcare (Matsen, 1999; van Brakel et al., 2010). The study made by van Brakel et al. (2010) have also concluded that veterans were more satisfied compared to other patients with non-violent amputation causes. The current thesis had though significant differences regarding the subgroups age and average years of prosthetic usage. The veterans had a longer prosthetic usage, which could have affected that there were no significant differences found between these subgroups since the average years of usage could influence on patients’ satisfaction (Chen et al., 2014). Veterans had also a higher mean age in the current thesis, which perhaps could have had an impact on the results. However, there have been previous studies indicating that the age doesn’t affect the patients’ satisfaction (Chen et al., 2014; Geertzen et al., 2002; Pezzin, Dillingham, MacKenzie, Ephraim & Rossbach, 2004).

There were no significant differences regarding device, service and total score in QUEST 2.0 between the amputation levels TT and TF in the current thesis. The study made by Magnusson et al. (2013) indicated that it is more complicated to manufacture a TF prosthetic device due to the increased biomechanical aspects that needs to be taken into consideration. Previous studies have also indicated that TF amputees have lower mobility, higher energy consumption and fall rates compared to TT amputees (Davies & Datta, 2003; Gauthier-Gagnon, Grisé & Potvin, 1999; Magnusson et al., 2014; Vrieling et al., 2008). Hypothetical this might have a negative impact on satisfaction, but it was still no significant differences found in the current thesis. However, the results of this comparison should be taken with caution since it was not possible to achieve a large sample size and an equal distribution in the sample, which contributes to low power, higher standard deviation and affect the reliability of the results (Brookes et al., 2004; Button et al., 2013; Jackson, 2001). This concern also the results from the comparisons between the subgroups gender and living area, since they weren’t equally distributed either.

Limitations and advantages

Limitations and advantages have been discussed throughout this discussion section but there are further limitations and advantages that may have had an impact on the thesis. By using a quantitative method there will be both limitations and advantages (Rahman, 2017). It is a limitation that the patients must answer according to the alternatives in the questionnaire,
which can be strongly limiting within the healthcare where it’s beneficial to understand the reasons behind specific answers (Al-Busaidi, 2008; Ofili, 2014; Pope, van Royen & Baker, 2002). It’s also difficult to achieve an explanation or in-depth information about the outcome using a quantitative method compared to a qualitative (Crow et al., 2002). However, qualitative methods are more time consuming, requires more economical finances and have a lower reliability compared to a quantitative method (Crow et al., 2002; Pope et al., 2002). Therefore, a quantitative method was more suitable in the current thesis.

As far as the researchers are aware, this is the first thesis conducted in Vietnam using QUEST 2.0 as a measurement tool on patients’ satisfaction. There are only some other studies measuring patients satisfaction in Vietnam using other measurement tools. Therefore, it was a limitation to be able to compare the current thesis with previous studies made in Vietnam.

Future research

It is aspiring to conduct future research with a higher sample size and equal distributions between the subgroups, this to achieve a more reliable result that can be generalized to the population.

Since a quantitative study have its limitations as discussed, it would be interesting to also conduct a future qualitative study on patients’ satisfaction to retrieve an explanation of the outcome. It is essential to conduct both a quantitative and qualitative study to retrieve a broader aspect and an understanding to a specific phenomenon (Al-Busaidi, 2008).

It would be interesting to investigate further differences regarding patients’ satisfaction between other subgroups such as orthotic vs. prosthetic patients or upper limb amputees vs. lower limb amputees. Furthermore, it would also be interesting to compare patients’ satisfaction between high-income countries and developing countries to investigate if there are potential differences and see if developing countries is progressing their development through time.
Conclusion
In conclusion, the patients in Danang showed to be quite satisfied with their prosthetic devices, even though the majority of patients reported problems with the durability of their prosthetic device. The thesis results also indicate that patients were more or less satisfied with their prosthetic services. Significant differences were found between genders regarding the satisfaction with their prosthetic devices, where women were less satisfied compared to men. However, no significant differences were found between men and women regarding the patients’ satisfaction with prosthetic services. In the subgroups: living area, amputation cause and amputation level, there were no significant differences regarding the prosthetic device or service. These conclusions should although be taken with caution, since it was not possible to generalize the results to the population due to the limitations in the thesis. Furthermore, the reliability and validity got unfortunately affected by the chosen method, small sample size and the unequal distribution in some of the subgroups, which makes it hard to draw trustworthy conclusions.

Acknowledgements
A special thanks and appreciation to the Swedish International Development Cooperation Agency (SIDA) for receiving the Minor Field Study scholarship that made our thesis possible to conduct. We would also like to thank Mr. Phan Thanh Hai from the ICRC for providing us with their patients. A special thanks to our supervisors, Dr. Cao Bich Thuy and Mr. Fredrik Thidell for their support through this whole process. Furthermore, we would like to give a huge thanks to our motorbike crew, Mrs. Kim Cam Nguyen and Mrs. Cam Van Thi Luong for their support and friendship. Lastly, our families deserve a huge thanks for their endless support and love.
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doi:10.3109/03093649909071619


Appendices

Appendix 1: QUEST 2.0

Quebec User Evaluation of Satisfaction with assistive Technology

QUEST (Version 2.0)

Technology device: ________________________________

User name: ______________________________________

Date of assessment: ______________________________

The purpose of the QUEST questionnaire is to evaluate how satisfied you are with your assistive device and the related services you experienced. The questionnaire consists of 12 satisfaction items.

- For each of the 12 items, rate your satisfaction with your assistive device and the related services you experienced by using the following scale of 1 to 5.

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<tr>
<td>not satisfied at all</td>
<td>not very satisfied</td>
<td>more or less satisfied</td>
<td>quite satisfied</td>
<td>very satisfied</td>
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- Please circle or mark the one number that best describes your degree of satisfaction with each of the 12 items.

- Do not leave any question unanswered.

- For any item that you were not "very satisfied", please comment in the section comments.

Thank you for completing the QUEST questionnaire.

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<tbody>
<tr>
<td></td>
<td>not satisfied at all</td>
<td>not very satisfied</td>
<td>more or less satisfied</td>
<td>quite satisfied</td>
<td>very satisfied</td>
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**ASSISTIVE DEVICE**

**How satisfied are you with:**

1. the **dimensions** (size, height, length, width) of your assistive device?
   
   *Comments:*

   1  2  3  4  5

2. the **weight** of your assistive device?
   
   *Comments:*

   1  2  3  4  5

3. the **ease in adjusting** (fixing, fastening) the parts of your assistive device?
   
   *Comments:*

   1  2  3  4  5

4. how **safe and secure** your assistive device is?
   
   *Comments:*

   1  2  3  4  5

5. the **durability** (endurance, resistance to wear) of your assistive device?
   
   *Comments:*

   1  2  3  4  5

6. how **easy** it is to use your assistive device?
   
   *Comments:*

   1  2  3  4  5

7. how **comfortable** your assistive device is?
   
   *Comments:*

   1  2  3  4  5

8. how **effective** your assistive device is (the degree to which your device meets your needs)?
   
   *Comments:*

   1  2  3  4  5

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### SERVICES

**How satisfied are you with,...**

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<td>not satisfied at all</td>
<td>not very satisfied</td>
<td>more or less satisfied</td>
<td>quite satisfied</td>
<td>very satisfied</td>
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- **9. the service delivery** program (procedures, length of time) in which you obtained your assistive device?
  
  *Comments:*  
  
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- **10. the repairs and servicing** (maintenance) provided for your assistive device?
  
  *Comments:*  
  
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- **11. the quality of the professional services** (information, attention) you received for using your assistive device?
  
  *Comments:*  
  
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- **12. the follow-up services** (continuing support services) received for your assistive device?
  
  *Comments:*  
  
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- Below is the list of the same 12 satisfaction items. PLEASE SELECT THE THREE ITEMS that you consider to be the most important to you. Please put an X in the 3 boxes of your choice.

1. Dimensions
2. Weight
3. Adjustments
4. Safety
5. Durability
6. Easy to use

7. Comfort
8. Effectiveness
9. Service delivery
10. Repairs/servicing
11. Professional service
12. Follow-up services

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QUEST
Scoring Sheet

This page is for scoring the answers to your questions.
DO NOT WRITE ON THIS PAGE.

• Number of non-valid responses

• **Device** subscale score
  For items 1 to 8, add the ratings of the valid responses and divide this sum by the number of valid items in this scale.

• **Services** subscale score
  For items 9 to 12, add the ratings of the valid responses and divide this sum by the number of valid items in this scale.

• Total **QUEST** score
  For items 1 to 12, add the ratings of the valid responses and divide this sum by the number of valid items.

• The 3 most important satisfaction items:

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Appendix 2: Additional questions

Welcome!

Below are some questions regarding your socio-demographics, prosthetic characteristics and usage. Please put a cross by the box you consider most appropriate. If you have any questions, feel free to ask the researchers.

Age:

Gender:
☐ Male ☐ Female

Occupation
☐ Working ☐ Unemployed
☐ Retired ☐ Student
☐ Other

Living area
☐ Rural ☐ Urban

Amputation level:
☐ Transtibial (TT) Below knee
☐ Transfemoral (TF) Above knee
☐ Other

If other, what amputation level?

Amputation cause:
☐ War (veteran) ☐ Landmine accident ☐ Traffic accident
☐ Disease ☐ Congenital ☐ Work accident
☐ Other
Years using a prosthetic device (since amputation):

How many hours per day do you use your prosthetic leg (approximately)?

- 0-3 hours
- 4-6 hours
- 7-9 hours
- 10-12 hours
- 13-15 hours
- More than 15 hours
Appendix 3: Consent form

Informed Consent Form

We are inviting patients with lower limb amputation in Vietnam to participate in our bachelor thesis regarding patients satisfaction with given prosthetic device and service.

Amputations in Vietnam is very common and therefore an important subject to investigate. The reason we are doing this research is to find out how satisfied the lower limb amputees are with their given prosthetic device and service, so future development within this area can increase.

This research will involve a questionnaire regarding satisfaction and service with your prosthetic device. If you have any questions regarding this study you can ask the researchers and they will be here to help you.

Your participation in this research is entirely voluntary. It is your choice whether to participate or not. Whether you choose to participate or not, all the services you received will continue and nothing will change. You may also withdraw your participation in the research at any time you choose. It is your choice and all of your rights will still be respected.

There may not be any benefit for you but your participation is likely to help us find the answer to the research question. There may not be any benefit to the society at this stage of the research, but future generations are likely to benefit.

The information that we collect from this research project will be kept confidential. Information about you that will be collected during the research will be put away and no-one but the researchers will be able to see it. Any information about you will have a number on it instead of your name. Only the researchers will know what your number is and your personal information will be kept anonymous. It will not be shared with or given to anyone except the researchers.

If you have any further questions about the study, please contact the researchers:

Behar Rexhaj - rebe1439@student.ju.se          Therésia Danielsson - dath1390@student.ju.se

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this research.

Written Name of Participant

__________________
Signature of Participant ______________________

Date ________________________________

   Day/month/year
Appendix 4: Instruction sheet

This instruction sheet is for the interpreter about how the process of translation shall be during hand-outs and how consent form, additional questions and QUEST 2.0 shall be administered.

General instructions

- Interpreter shall have read the consent form, additional questions and QUEST 2.0.
- Interpreter shall be well prepared and have understood the above mention documents, if the interpreter has any questions about the documents an explanation from the researchers shall be given before the handouts.
- If the patients aren’t able or doesn’t want to read by themselves, all documents shall be read to them by the interpreter precisely as they are written.
- If the patients have any questions these shall be translated to the researchers for explanations, it is important that the interpreter doesn’t personally answer the questions.
- The interpreter shall not have any influence on the patients’ answers in the questionnaires.

Consent form

- It is important to make sure that the patients understands the consent form and signs it if they want to participate in the thesis.
- If the patient doesn’t want to participate, don’t judge or force them to do it.

Additional questions & QUEST 2.0

- The interpreter shall make sure that the patients understand the questionnaires and the rating system.
• If the patient talks about something beyond the questions that are asked, this shall be translated to the researchers. If it’s irrelevant information the interpreter shall try to redirect the patient to the questionnaire in a respectful manner.

• If the patients have supplementary information to add on QUEST 2.0, the patients shall write this on the comment section or communicate this to the interpreter for translation.

If you have any questions about this instruction sheet feel free to ask the researchers.