The Use and Non-use of Assistive Technology in Italy: Preliminary Data

Stefano FEDERICI*1 and Simone BORSCI*

*Department of Human and Education Sciences, University of Perugia, Italy

Abstract

Purpose The present pilot study aims to analyse the relationship between the reasons of assistive technology (AT) use/non-use and the levels of user satisfaction of Italian users/patients in order to identify which features better predict AT non-use in the Italian Territorial Health Service Providers (THSPs) AT assessment process.

Method Between November 2010 and January 2011, a telephone structured interview with open- and closed-ended questions was administrated to 430 THSP users/patients who have received a hearing aid or a stairlift at least one year before.

Results Findings show a 25% of AT non-use and a strong correlation (p<.001) between AT non-use and the AT users/patients' dissatisfaction reasons – adjustments and personalisation, safety, and comfort. Of particular interest is the fact that users/patients tend to not use the AT if the follow-up provided by the THSP is dissatisfactory. A strong correlation (p<.001) is also founded among the AT satisfaction, measured by the QUEST 2.0, and some reasons of non-use; the users, indeed, claimed that they are likely to not use the AT when they are not satisfied by: i) The AT dimension or the weight, since it was hard to make it work and it did not help users/patients to perform better; ii) The AT personalisation, since they had to require more assistance than was really necessary and the AT did not help them to achieve their goals; iii) The AT safety, since users/patients had to spend a lot of energy using the AT, so involving other people (caregivers) who complained about the AT; in other cases, conversely, the safety dissatisfaction was linked to a low degree of transportability and storability of the aids; iv) The AT simplicity of use and effectiveness, since the AT did not help users/patients to perform better; v) The AT comfort, since AT required a lot of training and assistance in use, did not help to achieve users/patients goals, was not comfortable and/or was difficult to wear.

Conclusion Our data clearly show that the users' satisfaction of AT and of service providers are strongly correlated to the AT non-use, by suggesting that just a user-driven process of AT assignation process, centred on the user/patient needs and expectations might reasonably prevent the AT non-use and abandonment. The 25% of AT non-use estimated in this survey is slightly lower compared to the range of percentages usually reported by international studies that is rated from 29% to 33%. Albeit our findings suggest that there is a lower percentage of non-use than in other health systems, the AT non-use level remains high (about one quarter of the ATs assigned are not used), becoming a significant economic loss for the Italian National Health System.

Keywords. Assignation Process, Assistive Technology Assessment, Non-use and abandonment, QUEST 2.0, User-Centred Design, Satisfaction, National Health Systems.

---

1 Stefano Federici email: stefano.federici@unipg.it.
Introduction

Assistive Technology (AT) plays a key role in facilitating the social integration and participation of people with physical, sensory, communication, and cognitive disabilities. The process of matching AT and person requires a well-designed and researched sequential set of assessments administered by professionals with different areas of expertise: the success of the matching is determined by the evaluation protocol/model and by the skills of the multidisciplinary team members. In Italy and other countries, matching may be provided primarily by centres for technical aids, where a team of experts connects the person with a disability and one or more AT devices.

In Western countries, the process is characterised by two apparently opposing models: in one of them, the most widespread in Italy and other European countries, the person who requires an aid is considered to be a user/patient of a public health system; in the other one, more widespread in English-speaking countries (e.g. USA), the person with a disability may be viewed more as a customer of a private/non-national health system. In the first case, the centre does not sell products but provides evaluation services and aids to users/patients; in the second case, the centre for technical aids may also sell the technological aid provided. The first model guarantees more professional neutrality in assessing and matching technology; the second model favours user-centred satisfaction with the product found to be a good match.

Nowadays, there are no studies that have analysed the differences in the AT use/non-use between users of private/non-national health systems and those of national health systems. On this particular issue, there are no Italian assessment published studies. Anyway, well-known international studies on abandonment in private/non-national health systems [1, 3, 6–9, 13, 15–19] agree on abandonment equal to about one-third of the assigned devices. These data point out users’ widespread dissatisfaction and frustration, probably because the user did not find facilitated his or her performance.

1. The Matching Aid and Person project

Our study presents preliminary data of a research project entitled Matching Aid and Person (MAP), financed by the Umbria Region in 2009. The MAP project aims to identify the percentage of AT non-use and the users’ satisfaction of AT in a national health system in order to check the quality of health service provided by the Umbria Region to residential citizens and prevent waste of public money. The development of the MAP project is based on the proposals of the Umbria Regional Health Plan 2009–2011 [12], in which the need of improving the service quality and the users’ satisfaction have been declared, reducing the risk of abandonment and the consequent waste of public resources. This goal can be obtained only by improving communication and sharing of expertise among the Territorial Health Service Providers (THSPs), building up a best practice guide. The MAP project is structured on a “User-Centred...
Design” ergonomic approach suited on the biopsychosocial model of disability that complies with the request and the need of disabled people of “nothing about us without us” [2]. The Umbria Region declares [11] a strong diversity of the care and organisational models and of the therapeutic pathways among the THSPs, which inevitably affects the processes for the assignment of assistive tools to disabled people. This non-homogeneity of organisational models is associated with a lack of planning and optimisation of the assignment process, showing also a delay in revising the models that are not user centred. These factors, usually, show a high correlation with the abandonment and non-use of ATs, with a consequent waste of resources and a high users’ dissatisfaction; thus failing the aim stated in the Regional Plan to “encourage the disabled people in the achievement of the best possible activity and participation” [12]. The MAP project aims to make clear not only the model of the assignment process and specifically how much that model takes into account human needs and satisfaction, but also the amount of AT that would be available for their reuse into the virtual cycle of health for the benefit of other users. The MAP project pursues two main goals: i) the first one aims to design, analyse and compare the regional THSP assignation processes in order to build up a best practice guide able to unify and standardise the different kinds of assignation process. The MAP team has used the ideal model of AT assignation process described by Scherer and Federici [14] as criterion to compare and evaluate each THSP of the Umbria Region. This analysis is still going on; ii) the second one aims to analyse, by a user-centred perspective, the relation among the assignation process, the satisfaction and the non-use of the AT. The present study is focused on the second aim of the MAP project.

2. Materials and methods

Between November 2010 and January 2011, a telephone structured interview with open- and closed-ended questions was administrated to 430 THSP users who have received an AT at least one year before.

2.1. Tool

A user/patient evaluation of use of and satisfaction with AT survey questionnaire was developed by using some of the questions of the Philips and Zhao’s Abandonment Survey Questions [10], the entire Quebec User Evaluation of Satisfaction with Assistive Technology (QUEST 2.0) [4, 5] and by creating new questions about demographic user data and the evaluation of all services provided by the THSP. The survey questionnaire, so composed, is a structured interview with open- and closed-ended questions in four sections, as described in the following list:

- **Anamnestic – section 1**: composed of eight questions; the main goal of this section is to identify who answers the questions (the user, the caregiver, or the user and the caregiver together), and the kind of AT.
- **National services evaluation – section 2**: composed of five questions; this section aims to obtain a global evaluation of the i) THSP office for assignation; ii) general health care services provided by the THSP; iii) the time perceived by users spent obtaining the AT; iv) the number of steps perceived by users obtaining the AT; v)
the bureaucracy perceived by users in the process. Each question is a 5-point Likert scale from 1 (not satisfied at all) to 5 (very satisfied).

- **Users' satisfaction with AT – section 3**: composed of a QUEST Italian version 2.0 [4, 5]. The QUEST can be used as a self-administration questionnaire or as an interview, with the response categories ranging from 1 (not satisfied at all) to 5 (very satisfied). The QUEST scores can be analysed by three scales: Device (from Q1 to Q8), Services (from Q9 to Q12), and a Total score. All scores are calculated by summing and then averaging valid responses to assigned items [4, 5].

- **AT non-use – section 4**: composed of 17 questions (from A1 to A17), this section is administered only to the users that declared the abandonment of the AT. For the interview on the abandonment, we selected among the 30 questions used in the study of Philips and Zhao [10], the 23 that those authors have indicated as the questions that have obtained the most number of answers, in their study, by the users. We also excluded six questions indicated by Philips and Zhao from our survey on abandonment, because they are contained (implicitly or explicitly) in other sections of the global survey (Table 2). All these questions have three options of answers: Yes, No, I do not know [10] except for A15 (How long have/did you use AT?) that is expressed by four time options.

The survey questionnaire was administered through a telephone interview to 430 THSP users who have received an AT at least one year before. The list of participants was provided by the THSP subject to the agreement between the Department of Health of the Umbria Region and the Department of Human and Education Science of the University of Perugia.

### 2.2. Participants

A database of 430 participants was provided by the THSP with users who have obtained a hearing aid (HA) (355) or a stairlift (SL) (75) at least one year before the survey. One hundred and four participants (25 male, 79 female) accepted to respond to a telephone interview with a response rate of 24.1%, of whom 81 (77.9%) obtained a HA and 23 (22.1%) have obtained a SL. Data about AT users was provided via telephone by the users themselves alone (25%: M of AT users age = 72.5; SD = 16.2); or by the user with the help of third-party, e.g. family members or caregivers (2%; M of AT users age = 77.3; SD = 12.7); or third-party alone, e.g. family members or caregivers (73%; M of AT users age = 78.5; SD = 12.1).

### 2.3. Data analysis

Initially, descriptive analyses (Mean [M], Standard deviation [SD]) were conducted to explore the features of the sample. Psychometric properties of reliability and validity in the QUEST 2.0 Italian version were then assessed. The correlations among the subscales of the QUEST and the scores of the section 2 (national services evaluation) and the section 4 (non-use of AT) of the survey questionnaire were calculated by Pearson’s correlation coefficient. A sufficiently high score indicates that users’ satisfaction correlates with AT non-use reasons. Data were processed using the software IBM®/PAWS Statistics18.
3. Results

3.1. Users’ evaluation of national service and user satisfaction

The users’ evaluation of the national service (survey section 2) shows that 70.6% of the users are satisfied with the service provided by the HTSP (51.9% quite satisfied, 11.5% very satisfied), albeit the 29.4% of the participants claimed that they are more or less satisfied 11.1%, not very satisfied 12.5%, or not satisfied at all 5.8%. The analysis of users’ satisfaction with AT (section 3) obtained by the administration of the QUEST’s total scores shows that the global score for the HAs’ satisfaction (M=4.08, SD=.81) is less than the satisfaction of the users that have received a SL (M=4.43, SD=.87). The level of users’ satisfaction that have obtained HAs is decreased due to low scores (but sufficient) of satisfaction for the services provided by the HTSP (M=3.19, SD=.86). The different levels of satisfaction are clearer when we analyse the satisfaction percentage declared by the users in each question of the QUEST. Overall, users have a good level of device satisfaction (from Q1 to Q8), with some problems with the safety (Q4) of the AT, particularly for HA users who declared a 38.3% of dissatisfaction, while SL users are dissatisfied for 17.4% of the cases. A durability problem is evident for the HA users who are dissatisfied for 19.8% of the cases (Q5); at the same time, these users show a high dissatisfaction also for the comfort (Q7) and for the effectiveness (Q8) of the AT. A higher degree of dissatisfaction is declared by the HA users than the SL ones: 21% of the HA users are dissatisfied with the comfort and 37% with the effectiveness, while the SL users declared a dissatisfaction of 17.4% for the comfort and 13% for the effectiveness. The analysis of the QUEST’s questions from Q9 to Q12, concerns the users’ satisfaction of the service offered by the THSP in providing the AT. This analysis shows that there is a very high degree of dissatisfaction with the THSP service delivery (Q9), particularly 83% of users declared that the problem is the time spent obtaining the AT (25.9% for HA users, and 34.8% for SL ones). A warning level of users’ dissatisfaction also concerns both the professional service (Q11) and the follow-up (Q12) which respectively have obtained a dissatisfaction degree equal to 14.8% (HA) and 13% (SL) for the professional service, and 13.6% (HA) and 21.7% (SL) for the follow-up.

The correlation between national service evaluation (survey section 2) and the users’ satisfaction with AT (survey section 3) is analysed by the Pearson’s coefficient. This analysis shows a good correlation between the national service evaluation and the following questions that composed the QUEST’s device satisfaction scale: the weight of the aids (Q2; r=.201, p<.05), the easiness of adjustment of the aids (Q3; r=.206, p<.001), the simplicity of use (Q6; r=.206, p<.05), the comfort (Q7; r=.245 p<.05) and the effectiveness of the aid (Q8; r=.239, p<.05).

At the same time a very strong correlation (p<.001) is shown between the evaluation expressed by users in the section 2 and all the questions that composed the scale service of QUEST (from Q9 to Q12).

3.2. Users’ satisfaction and users’ non-use

The analysis of the non-use of AT (section 4) shows that there are 25% of AT non-use in the THSP and a strong inverse correlation among the users’ AT non-use and section 3 (Table 1).
Table 1. Pearson’s correlation index between the non-use of AT (section 4) and the QUEST scales ‘Device’ and ‘Service’ (survey section 3). Significant correlations are found within the scale ‘Device’ – Adjustments (Q3), Safety (Q4), Comfort (Q7) – and ‘Service’ – Follow-up (Q12).

<table>
<thead>
<tr>
<th></th>
<th>Q3</th>
<th>Q4</th>
<th>Q7</th>
<th>Q12</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT Non-use</td>
<td>-.194*</td>
<td>-.275**</td>
<td>-.207*</td>
<td>-.225*</td>
</tr>
</tbody>
</table>

*The correlation is significant at level .05; **The correlation is significant at level .01.

The results show that unless the user is satisfied with AT adjustment (Q3), safety (Q4) and comfort (Q7), the more likely he or she does not use technology. At the same time an important role in the use/non-use of AT is played by follow-up service. The percentages of the different reasons that contribute to the AT’s non-use (survey section 4), are shown in Table 2, excluding from the analysis the question A15 (How long have/did you use it?) which provides answers in the scale of time.

Table 2. Frequencies of users’ responses to the optional survey on the reasons of AT non-use.

<table>
<thead>
<tr>
<th></th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>I do not know (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>65.4</td>
<td>30.8</td>
<td>3.8</td>
</tr>
<tr>
<td>A2</td>
<td>69.3</td>
<td>26.9</td>
<td>3.8</td>
</tr>
<tr>
<td>A3</td>
<td>46.2</td>
<td>46.2</td>
<td>7.6</td>
</tr>
<tr>
<td>A4</td>
<td>46.2</td>
<td>53.8</td>
<td></td>
</tr>
<tr>
<td>A5</td>
<td>69.2</td>
<td>30.8</td>
<td></td>
</tr>
<tr>
<td>A6</td>
<td>42.4</td>
<td>53.8</td>
<td>3.8</td>
</tr>
<tr>
<td>A7</td>
<td>38.5</td>
<td>61.5</td>
<td></td>
</tr>
<tr>
<td>A8</td>
<td>38.5</td>
<td>57.7</td>
<td>3.8</td>
</tr>
<tr>
<td>A9</td>
<td>53.8</td>
<td>46.2</td>
<td></td>
</tr>
<tr>
<td>A10</td>
<td>27%</td>
<td>61.5</td>
<td>11.5</td>
</tr>
<tr>
<td>A11</td>
<td>15.4</td>
<td>65.4</td>
<td>19.2</td>
</tr>
<tr>
<td>A12</td>
<td>15.4</td>
<td>76.9</td>
<td>7.7</td>
</tr>
<tr>
<td>A13</td>
<td>80.8</td>
<td>15.4</td>
<td>3.8</td>
</tr>
<tr>
<td>A14</td>
<td>80.8</td>
<td>15.4</td>
<td>3.8</td>
</tr>
<tr>
<td>A16</td>
<td>34.6</td>
<td>50%</td>
<td>15.4</td>
</tr>
<tr>
<td>A17</td>
<td>42.3</td>
<td>57.7</td>
<td></td>
</tr>
</tbody>
</table>

A great level of correlation is shown among the questions of QUEST (survey section 3) and the reasons of non-use gathered by section 4 (Table 3).

Table 3. Pearson’s correlation index among the QUEST items (survey section 3) and the reasons of AT non-use (survey section 4). Seven items of QUEST (Q1, Dimension of aid; Q2, Weight of aid; Q3 Adjustments; Q4, Safety; Q6, Simplicity of use; Q7, Comfort; Q8, Effectiveness), show a correlation with one or more of the following reasons of AT non-use: A3 – Did you require more than 2 hours of training in AT use? A4 – Is/was it easy to make AT work? A5 – Do you require assistance in using the device? A7 – Did/does the AT help you perform better? A8 – Was/is the AT comfortable? A11 – Did/does it demand a lot of energy/time to use (others)? A12 – Did/do others complain about the item? A13 – Was/is it easily transportable? A14 – Was/is it easily stored? A16 – Did/does it wear well?

<table>
<thead>
<tr>
<th></th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q6</th>
<th>Q7</th>
<th>Q8</th>
</tr>
</thead>
<tbody>
<tr>
<td>A3</td>
<td></td>
<td></td>
<td>-.652**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A4</td>
<td>-.408*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A5</td>
<td>-.490*</td>
<td>-.423*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A7</td>
<td>-.802**</td>
<td>-.802**</td>
<td>-.415*</td>
<td>-.414*</td>
<td>-.436*</td>
<td>-.610**</td>
<td></td>
</tr>
<tr>
<td>A8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.437*</td>
<td></td>
</tr>
<tr>
<td>A11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.452*</td>
</tr>
<tr>
<td>A12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.692**</td>
</tr>
<tr>
<td>A13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.453*</td>
</tr>
<tr>
<td>A14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.453*</td>
</tr>
<tr>
<td>A16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-.617**</td>
</tr>
</tbody>
</table>

*The correlation is significant at level .05; **The correlation is significant at level .01.
Our data clearly show that a good assignation process, favoured by a user-centred design and focused on the users’ needs is strictly related to AT user satisfaction and aid use/non-use. The relation between the satisfaction and the reasons of non-use is very strong, as it is shown in Table 2. The users claimed that they are likely to not use the AT when they are not satisfied with the following AT features:

- **Dimension (Q1) or weight (Q2):** in this case users claim that it is hard to make AT work (A4) and/or AT does not help them to perform better (A7).
- **Personalisation (Q3):** in this case users have to require more assistance to use the AT than is really necessary (A5) and, also, the AT does not help them to achieve their goals (A7).
- **Safety (Q4):** in this case users declare to spend a lot of energy in order to use the AT assigned (A11), involving other people (caregivers) and, in their turn, also the caregivers themselves complain about the AT assigned (A12). At the same time, the safety dissatisfaction could be also linked to a low degree of transportability (A13) and storability of the aids (A14).
- **Simplicity of use (Q6) and effectiveness (Q8):** in this case users affirm that the AT does not help them to perform better (A7).
- **Comfort (Q7):** in this case users complain about a lot of training (A3) and assistance in use (A5) required for the AT use. Moreover, the AT does not help users to perform better (A7), it is not comfortable (A8) and/or difficult to wear (A16).

4. Discussion

Our preliminary data shows an abandonment of 25% of AT. This percentage is lower than the percentages usually reported in other studies [1, 3, 6–10, 13, 15–19] that range from 29% to 33%. However, until now, the data are limited to just one of the four THSPs of Umbria Region and to specific kinds of AT (i.e. HAs and SLs). As Philips and Zhao, we adopted: “a stringent definition of abandonment that described only one outcome of a ‘person-technology’ interface. Changes in device brands that do not represent changes in device categories were not accounted for even though those changes may have been due to dissatisfaction with the original device” [10]. However we extend the perspective of analysis introducing both, an instrument for analysing the AT and service users’ satisfaction (QUEST 2.0) and for the evaluation of the global service provided by the Italian National Health System in the territory (survey section 2). By using the Philips and Zhao word “This study’s findings suggest that services designed to involve consumers and accommodate long term technology needs will enhance consumer satisfaction with AT and reduce device abandonment” [10]. In this sense our study remarks that just a user-driven process of AT assignation, centred on the user needs and expectations might reasonably prevent the AT non-use and abandonment.

Globally, users of public/national health systems declared a good satisfaction level of the THSP work. However, users complain about three main problems that affect the THSP service: the long delay in the delivery of the AT assigned, the lack of a follow-up, and a low professional profile in the technical support. Our results clearly show that the satisfaction of the users in AT use is linked to the satisfaction of the THSP; indeed, the correlation analysis shows that the more the users are satisfied about some AT...
features (e.g. weight, easiness of adjustments, simplicity of use, comfort and effectiveness) the more they are satisfied with the THSP service. At the same time our findings underline that the less users are satisfied with some AT features (e.g. adjustment, safety and comfort) the more likely they do not use technology.

The percentage of AT non-use found in this study shows that one quarter of the assigned AT are not used by the users. Even if this percentage of abandonment or non-use shows a lower rate compared to findings of international studies, this amount is still high, becoming a significant economic loss for the Italian National Health System.

Acknowledgement

Funding for the Match Aid & Person project has been provided by the Sanity and Social Services Department of the Umbria Region in 2009 (DGR 1318/09).

References

[11] Regione Umbria, Definizione delle linee organizzative regionali sulla riabilitazione domiciliare per le aziende sanitarie locali [Definition of regional organizational guidelines for the of home rehabilitation provided by local health], in, Regione Umbria, Perugia, IT, 2006.