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## Measurement of generic patient reported outcome measures (PROMs) in an acute admission unit: A feasibility study

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### ABSTRACT

**Objective:** Measuring patient-reported outcome measures (PROMs) is a challenge in Acute Admission Units (AAUs), where patients present with a variety of pathologies. Generic PROMs may be used to measure the quality of care in this population. The main objective of this study was to assess the feasibility of measuring generic PROMs in a Dutch AAU.

**Design:** Longitudinal cohort study **Setting:** An AAU of a tertiary hospital in Amsterdam, the Netherlands **Participants:** 123 patients admitted to the AAU during 5 weeks in May and June 2015 **Methods:** Patients admitted to the AAU were asked to fill out a questionnaire relating to three time points: 7 days before, during, and within 2 weeks after admission. Additionally, patients were asked to report on their experienced level of safety on the AAU and the contribution of the AAU to their recovery.

**Results:** There were significant trends in generic PROMs for all three domains. Physical functioning decreased during hospital admission and almost fully returned to the previous level after discharge. Satisfaction with social role and anxiety significantly decreased over time.

**Conclusions:** Measuring generic PROMs in the AAU is feasible. The analysis of the PROMs took little effort and results could be reported back to the healthcare workers on the AAU quickly. Patients appreciated being asked about their own perceived health and the quality of care. Given that this is the first study focusing on PROMs in AAU patients in the Netherlands, future studies with larger sample sizes, and from other nations are needed to further investigate PROMs in this patient group to establish International reference values.

### KEY POINTS

- Measuring and analysis of generic PROMs in a Dutch AAU is feasible.
- Results could be reported back to the healthcare workers on the AAU quickly.



- Patients appreciated being asked about their own perceived health and the quality of care.
- There were significant trends in generic PROMs for all domains.

## INTRODUCTION

Although widely recognised in the UK, Acute Admission Units (AAU) are a relatively new concept in the Netherlands. The AAU in VUMC is a designated ward where a multidisciplinary medical and surgical team manages patients for up to 72 hours, following emergency admission via the Emergency Department (ED) or out patient clinic.

The AAU is staffed and equipped to receive medical and surgical inpatients needing treatment for acute illnesses, along similar lines to models described in the UK.<sup>1</sup> In the Netherlands, where about two million patients rely on acute care at the emergency department every year, a large number of (academic) hospitals have implemented an AAU.<sup>2</sup> In contrast to other countries in Europe such as the United Kingdom, where typically only medical patients are treated, the AAU in the Netherlands also houses beds for a broader set of specialities, including surgery, trauma, orthopaedics, and urology.

Because of this heterogeneity it can be a challenge to measure patient experiences and quality of care in an AAU universally. In an age where growing attention is paid to the patients' perspective on quality of care and treatment effectiveness, evaluating 'patient-related outcome measures' (PROMs) has become increasingly important. To assess PROMs, standard measurement tools have been developed to capture patients' perceptions of their general health and/or specific diseases and conditions.<sup>3, 4</sup> PROMs can provide information on how a patient appreciates his or her own health status, as well as the experienced impact of a (surgical) procedure or a prescribed treatment.<sup>5</sup> PROMs are increasingly utilised alongside clinical quality indicators to enhance shared decisionmaking between patients and clinicians.<sup>2, 6, 7</sup>

### [TABLE 1]

The National Institution of Health (NIH) in the United States has developed the Patient-Reported Outcomes Measurement Information System.

(PROMIS®)<sup>8-10</sup> to enable validated and uniform implementation PROMs in clinical practice.

Disease-specific PROMs<sup>11</sup> are designed to evaluate the impact of a specific condition on patients' functioning.<sup>8, 12-17</sup> Generic PROMs, enable various aspects of functioning, such as self-care, physical functioning, and anxiety to be measured.<sup>3, 10</sup> Until now, the use of PROMs in the Netherlands has been largely restricted to orthopaedic patients, and implementation in other departments is still in early stages.<sup>18,19</sup> Several International studies have been performed using and validating PROMs in a more heterogeneous population.<sup>5, 20-22</sup> In the Netherlands, however, no study has investigated the feasibility of the generic PROMs in a general Dutch hospital population (regardless of specialty or diagnosis at admission).<sup>3</sup> It seems logical that, given the heterogeneity of AAU patients, generic PROMs are used to assess quality of care based on patients' experiences.

The main objectives of this longitudinal cohort study were to 1. To assess the feasibility of measuring generic PROMs in a Dutch Acute Admission Unit 2. To

investigate whether generic PROMs could be used to measure physical functioning, anxiety and satisfaction with social role in a general Dutch AAU population. Secondary aims were to evaluate aspects of other key elements of quality: the feeling of safety and overall experiences in an AAU through the patient's perspective.



## METHODS

### Study design

Between May and June 2015, in a period of 5 weeks (day shifts Monday to Friday), patients admitted to the AAU were invited to participate in this study by the researcher. 123 patients aged 18 or over were recruited as soon as possible upon their admission and included in the study. Following the morning handover one of the two professionally trained researchers (WS or LG) recruited the patients. Patients were not asked to participate if they were unable to give informed consent as judged by researcher, for example because of severity of illness, impaired cognition, language barriers, or strict isolation measures. After obtaining informed consent, participants were requested to complete the questionnaire. First, they were asked to judge in retrospect (T0) the situation 7 days prior to receiving care on AAU and second, the situation at the moment of completing the questionnaire (T1) (Table I). Depending on the capability and preference of the patient, the coordinating researchers either asked questions himself or let the patient fill out the questionnaire on his or her own.

### [FIGURE 1]

During and after completing the questionnaire, the researcher documented the time taken to finish the questionnaire and monitored any extra comments or observations made by the patient. In this way, practical feasibility was observed. Additionally, participants were asked if they had any remarks on the questionnaire or advice for improvement.

Ten days after the discharge from AAU the patient was called (T2) to obtain a phone interview provided the patient granted permission to contact him through the phone during the index interview.

Patients were excluded from telephone followup if they were still in hospital at T2, having been transferred to another clinical area on discharge from AAU. During this telephone call, participants were once again asked to assess their health at that moment and the level of satisfaction regarding the care received during their admission (T2). The local Ethics Committee approved the study protocol.

### Questionnaire development

The questionnaire comprised questions from three domains of the Dutch version of the PROMIS Profile 29.0 (approved and translated by the Dutch- Flemish PROMS group in 2014), supplemented by a few short questions on the evaluation of patient safety, general functioning and overall experience on the ward (see table I). PROMIS 29.0 items are rated on a 5-point Likert scale.<sup>23</sup> The following domains of the PROMIS 29.0 were selected: anxiety, physical functioning, and satisfaction with social role. These domains were selected on the basis of their appropriateness and suitability within the patient population, after consulting researchers specialised in working with and translating PROMs, epidemiologists, and supervising clinicians.<sup>8</sup> Completion of the questionnaire took around 5-10 minutes per patient.

As is shown in figure 2, during the telephone follow-up 10 days after discharge from the AAU (T2), the same 12 items from the PROMIS 29.0 were asked. In addition, other questions about the perception of safety, contribution of AAU towards recovery, a question about general functioning and an item from the Net Promotor Score (NPS) were asked.<sup>24</sup> The NPS is based on the question ‘Would you recommend the hospital to friends and family?’ The score is calculated by subtracting the percent of patients rating the hospital 0-6 from the percent recommending the hospital with a score of 9 or 10. In total, the questionnaire at T2 contained 16 questions.

### Data analyses

Categorical outcome measures were presented as frequencies and percentages, whereas continuous variables were presented by mean and standard deviation and/or median and interquartile range.

Since the PROMs variables were not normally distributed, we chose a non-parametric test over the T-test for paired samples. We used Wilcoxon signed-rank test to compare the PROMs scores on T0, T1 and T2. To control for the family wise error rate of the three comparisons (T1 vs T0, T2 vs T1 and T2 vs T0) separately within each domain we used a Bonferroni correction and set the two-sided significance level at  $p=0,05/3=0,017$ . Satisfaction with social role was compared between T0 and T2 using a Wilcoxon rank-sum test using a two-sided significance level of 0,05 since there was no measurement of satisfaction with social role on T1. All statistical analyses were performed with Statistical Package for Social Sciences (SPSS) version 20.

## RESULTS

### Patient characteristics

The total study population consisted of 79 men (59.3%) and 49 women (30.7%) with a mean age of 58.8 years (SD 18.7, range 46-72). The mean length of stay in the AAU was 45 hours and 48 minutes (SD 32 hours). A total of 99 patients entered the AAU through the ED (80.5%). Other patient flow characteristics are shown in Figure I. Admitting speciality varied widely, thus creating a cross-section of an overall hospital patient population. Internal medicine (n=19, 15.5%), gastroenterology (n=17, 13.8%), and traumatology (n=15, 12.2%) were the largest specialty groups, followed by pulmonary medicine (n=13, 10.6%), orthopaedics (n=11, 8.9%), nephrology (11, 8.9%), urology (n=8, 6.5%), general surgery (n=7, 5.7%), haematology (n=7, 5.7%), neurology (n=6, 4.9%), and vascular surgery (n=2, 1.6%). A total of 33 patients had been admitted into a hospital within the 30 days prior to the AAU admission, indicating a readmission rate of 26.8% in this population. For 6 patients this AAU admission was their first time in hospital (4.9%), whereas for 87 patients this admission was the first time on an AAU (72.5%).

### [FIGURE 2]

### Feasibility

Figure II shows patient inclusion. A total of 123 patients completed the questionnaire at T1. During the study period, a total of 195 patients were admitted to the AAU. Seventy-two patients were not approached for inclusion on T1 since they were not



eligible. The main reasons for not approaching for inclusion were severity of illness (n=29, 41.4%), logistic reasons (being away for surgery etc.) (n=23, 32.9%) and language barriers (n=9, 12.9%).

At T1, 125 patients were approached for inclusion by coordinating researchers. The vast majority of patients (n=123, 98.4%) participated, only 2 (1.6%) refused to participate. More than half of the included patients (N=65, 52.8%) also completed the telephone questionnaire within 10 days after discharge from the Acute Admission Unit.

A few patients (5.7%, n=7) did not complete the total questionnaire at T1. Finishing the questionnaire took 6 (SD 2.9) minutes on average. However, patients who took the opportunity to share their worries and feelings with the coordinating researcher needed longer time to finish their questionnaire which explains the wide range in time. A group of 105 patients understood all the questions asked (85.4%), whereas 14 participants (11.4%) needed additional explanation.

For various reasons, the majority of patients (n=106, 86.2%) chose to obtain help in completing the questionnaire, resulting in the researcher reading out the questions. However, the researcher judged that about half of them were physically able to fill out the questionnaire themselves (n=51, 48.1%).

During telephone conversations patients firstly expressed their appreciation for someone calling them after discharge and they valued the fact that their unanswered questions after hospital admission were answered. In general, all patients understood the follow-up questions appropriately and were able to answer the questions.

Eighteen patients (14.6%) refused telephone follow-up. Thirty-three (31.4%) other patients did give permission for telephone follow-up but were not included at T2. This is because at T2 a third of the patients included at T1 were not immediately discharged home (n=33, 31.4%), because they either received additional care on other wards or health institutions, and therefore not eligible to be included (figure II). At T2, three patients could not be included because of they were not reachable at given numbers (7.5%). In addition, 4 patients in this group died during hospital admission (10%). None of the participants had remarks or suggestions for improvement of the questionnaire at either T1 or T2.

#### **Patient reported outcome measures:**

At three time points (T0, T1, and T2) patients were asked to report on the PROMs domains physical functioning, anxiety and satisfaction with social role.

The mean scores and standard deviations on these scales are given in Figure III.

#### **[FIGURE 3]**

There was a significant decrease in physical functioning between T0 and T1 ( $p < 0.001$ ), followed by a significant increase between T1 and T2 ( $p < 0.001$ ). Patients almost fully recovered to their pre-admission level, however physical functioning was still significantly lower at T2 when compared to T0 ( $p = 0.008$ ). Satisfaction with social role also significantly decreased between T0 and T2 ( $p = 0.01$ ). Experienced anxiety also declined between T1 and T2 ( $p = 0.007$ ) and between T0 and T2, ( $p = 0.000$ ).

At T2, 96.9% (n=63) of the patients felt they were in a safe environment on the AAU ('quite a bit' to 'very much') – figure III. In addition 60.0% (n=39) of the patients indicated that their stay at the ward contributed to their recovery ('quite a bit' to 'very much'). The average Net Promotor Score at T2 (a 0-10 score) was 39,7%. This

score implies that around 40.0% of patients at T2 would recommend the hospital with a 9 or 10. This is in line with the overall hospital Net Promotor Score of 40.0% at this hospital.



## DISCUSSION

### Summary and interpretations

The results of this study suggest that measuring generic PROMs on the AAU is feasible. Overall, patients were positive about the questionnaire, resulting in a high response rate. The questions asked were easily interpretable and applicable to the diversity of patients on the AAU. Because the questionnaire could be filled out on paper or with assistance of coordinating researcher it is applicable to the diverse population on the AAU. Since filling out the questionnaire was not time consuming (approximately 6 minutes), this also can be seen as an indication of its feasibility. For telephone follow-up (approximately 5 minutes) most patients also showed their readiness to be approached again. Patients were positive about the questionnaire since it gave them the feeling the hospital was really trying to take their perspectives on perceived care into account. Also it gave them the opportunity to share their experiences and were told where to look for answers to certain questions. The fact that PROMs took little effort and results could be reported back to the healthcare workers on the AAU quickly was also an important finding.

This study also shows that generic PROMs were suitable for all patients on the AAU; no adaptations were necessary for specific patient groups. Results indicated significant trends in PROMs for all three domains. Physical functioning decreased during stay and almost fully returned to old level after discharge, and anxiety decreased significantly over time. These findings suggest that generic PROMs are able to illustrate changes in patient perspectives on own perceived wellbeing before, during and after hospital admission.

This study also aimed to evaluate other aspects of key elements of quality: feelings of safety and overall patient experiences on the AAU through patients' perspective. In general, most patients showed a positive response regarding their feeling of safety during their stay on the AAU and regarding the contribution of the AAU to their recovery.

### [FIGURE 4]

#### Relation to other evidence

To our knowledge, this was the first study performed in the Netherlands to investigate generic PROMs in an Acute Admission Unit. Black (2013) noted that emergency admissions present a challenge in assessing patients' experiences of care since PROMs are often only available after the acute event.<sup>3</sup> The current study addresses this issue, by assessing PROMs on an AAU.

In comparison to most PROMs research, where focus is mostly on effectiveness of care using PROMIS®, this is the first study that adds safety and experience.

Grosse (2012) reported that poor experience of safety has an adverse impact on the effectiveness of care and therefore these key dimensions should not be ignored.<sup>25</sup> Previous work has demonstrated that generic PROMs can highlight physical or psychological problems which might otherwise be overlooked.<sup>5</sup> Generic PROMs



could therefore function as a starting point to discuss more appropriate care for the individual patient, thus enhancing shared-decision making.

A problem arising whilst assessing the PROMS in the Netherlands is that, in contrast to other countries, no Dutch reference values are available to enable comparison.<sup>20</sup> International data, such as the Net Promoter Score could be obtained,<sup>26</sup> although comparisons across different Nations can be problematic.<sup>27</sup> The UK 'Friends and Family test', for example, which assesses the likelihood of the patient recommending an NHS hospital, uses a different scoring system.<sup>24, 26</sup>

### **Limitations**

As already stated by McKenna (2011) in a welldeveloped measure, patients will only be asked questions that are relevant. In a heterogeneous group of patients, addressing these relevant areas can be a challenge because these issues may minimize respondent acceptability and increase missing data.

In this study we decided to take three specific domains since it was difficult to capture other areas of concern applicable to all patient populations. This may have led to our missing data on areas that could be of concern to a specific patient on the AAU.<sup>28</sup> Another limitation of this study is the direct approach of the coordinating researcher who in many cases assisted with the completion of the questionnaire. In practice there would not be a researcher available on every AAU. Since listening to the questionnaire being read out might lead to different scores than personal viewing of the questionnaires (one is probably more inclined to give extreme answers once one hears 5 answers rather than seeing them on paper) this might lead to less nuance/other results. In addition, we excluded the patients who were unable to give informed consent, for example because of severity of illness. This may have influenced the case mix of the group.

Finally, a general caveat of this study is the loss in follow-up at T2. Since a substantial group of the patients were still in hospital after their initial admission on the AAU, it can be challenging to create an appropriate time frame to ask questions for T2. Future studies should investigate measuring T2 at a later time point to achieve more complete follow-up information.

### **CONCLUSION AND IMPLICATION FOR PRACTICE**

The current study is the first study performed in the Netherlands to assess PROMs on the AAU.

The most important finding emerging from this study is that the measurement of generic PROMS in the Acute Admission Unit is feasible. This study has shown that, in a heterogenous patient population PROMs may be used to measure the wellbeing and feeling of safety through the patient's perspective.

Patients appreciated the fact that their view on these matters was taken into account contributing to the high percentage of overall patient participation.

The analyses of the PROMs took little effort and results could be reported back to the healthcare workers on the AAU quickly.

Future studies with larger sample sizes are warranted to establish reference values and ideal follow-up time to compare PROMs throughout the Netherlands.



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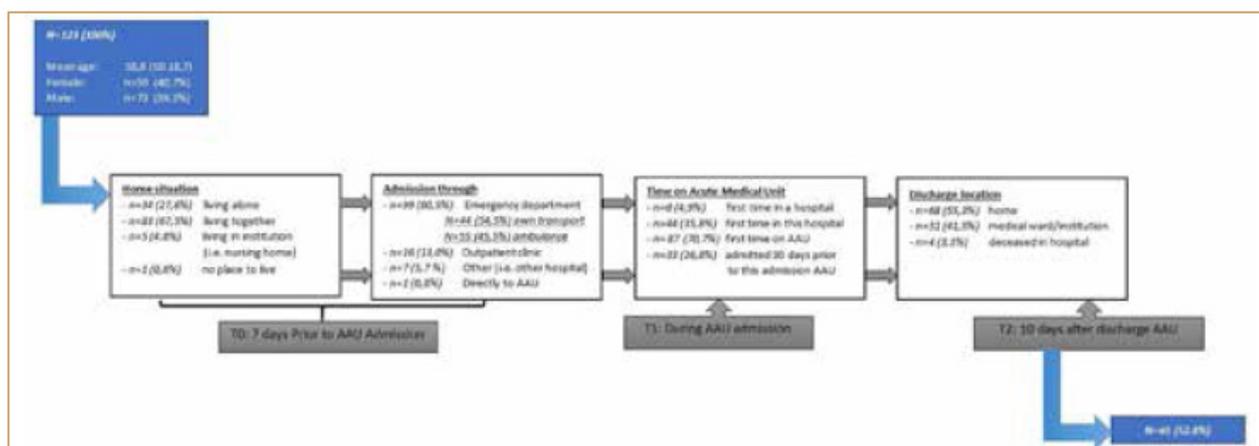


**TABLES AND FIGURES**

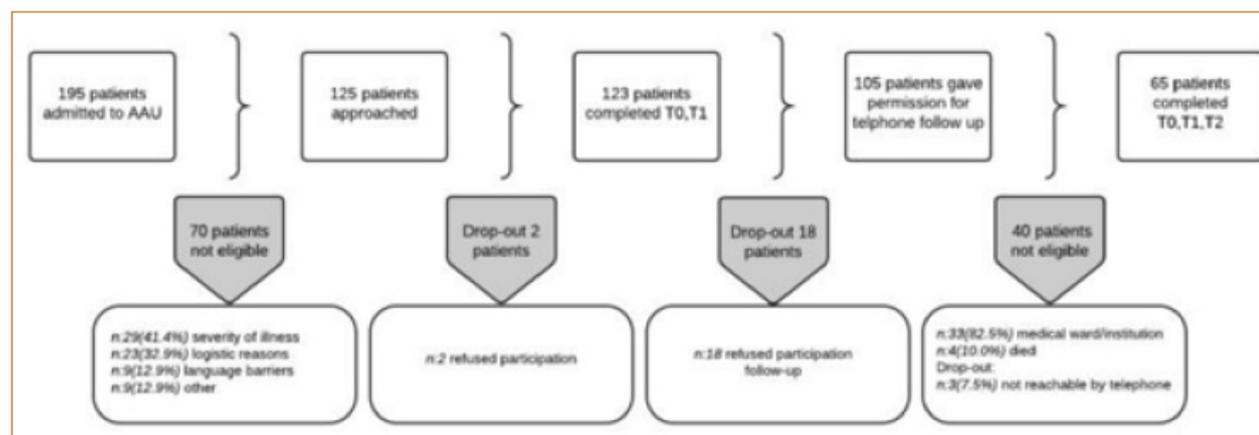
**Table I.** 'Content questionnaire at T0,T1,T2'

T0 <sup>^</sup> (7 days prior to AAU admission)	T1 (during AAU admission)	T2 (10 days after discharge AAU)
<b>PROMs (PROMIS 29.0 domains)</b> Physical function: 4 questions Anxiety: 4 questions Satisfaction social role: 4 questions  + <b>12 questions</b>	<b>PROMs (PROMIS 29.0 domains)</b> Physical function: 4 questions Anxiety: 4 questions Satisfaction social role: 0 questions*  <b>Additional questions</b> Experienced - safety 1 question - general functioning 1 question  + <b>10 questions</b>	<b>PROMs (PROMIS 29.0 domains)</b> Physical function: 4 questions Anxiety: 4 questions Satisfaction social role: 4 questions  <b>Additional questions</b> Experienced - safety 1 question - general functioning 1 question - AAU contribution to recovery 1 question  NET-Promotor Score 1 question  + <b>16 questions</b>

\* Asked at T1 in retrospect  
<sup>^</sup> Irrelevant during the admission



**Figure I.** 'Patient characteristics'



**Figure II.** 'Patient inclusion'

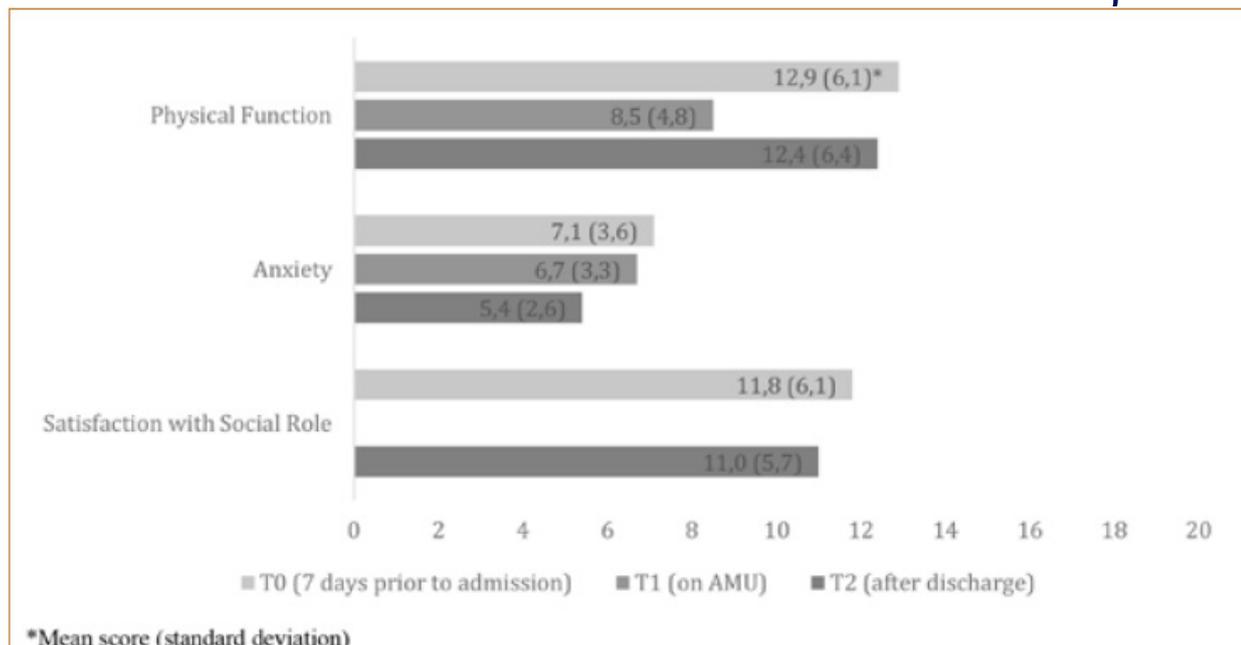


Figure III. 'Physical functioning, anxiety and satisfaction with social role'

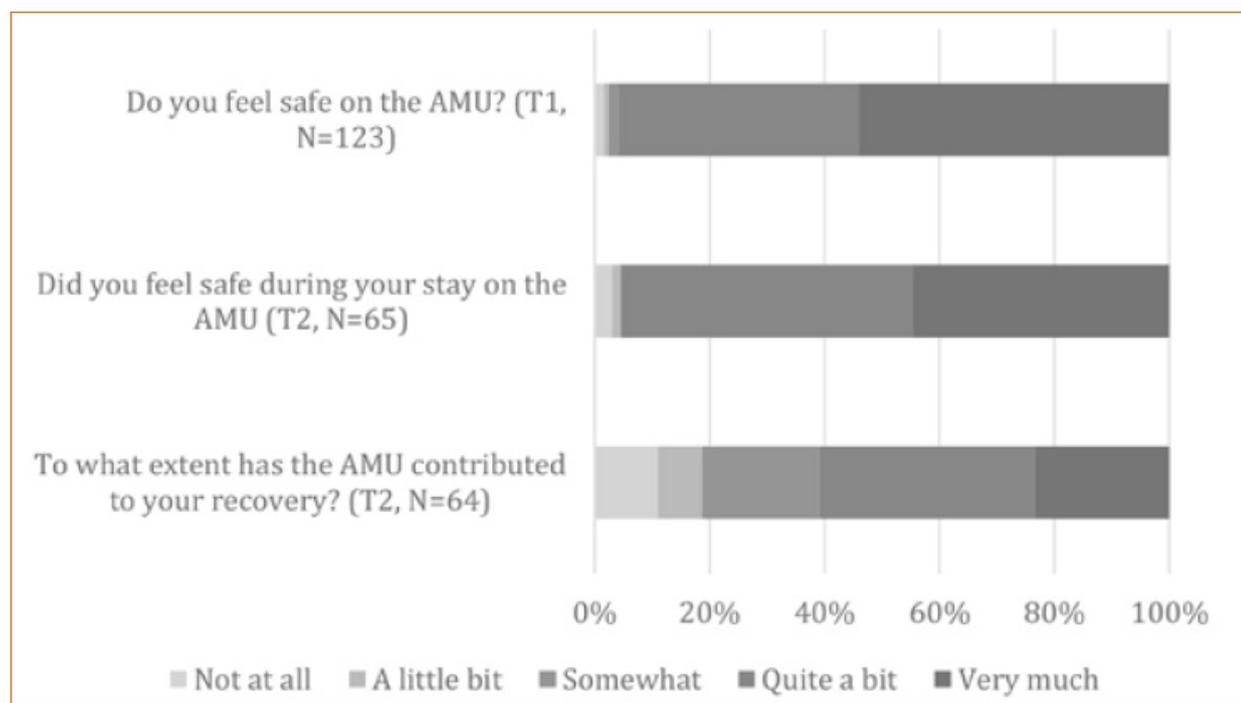


Figure IV. 'Feelings of safety and contribution to recovery on the AAU'