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To cite this article: Karin Persson, Sigrid Stjernswärd & Sten Levander (2019): FAST-O works well for characterization and monitoring of sheltered housing schizophrenia patients, Nordic Journal of Psychiatry, DOI: 10.1080/08039488.2019.1582696

To link to this article: https://doi.org/10.1080/08039488.2019.1582696

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Published online: 19 Mar 2019.

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FAST-O works well for characterization and monitoring of sheltered housing schizophrenia patients

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ABSTRACT
Objective: The de-institutionalizing process came to an end before the millennium shift by closing mental hospitals. After that some of the most ill patients are cared for in sheltered housing (SH). There is no in-house psychiatric competence and the staff on the floor usually lacks such knowledge and training. Observation instruments may improve this by making it possible to assess and monitor patients.

Method: FAST-O is a simple twelve-item observation scale. Staff at eight SH units were trained in using the instrument and then assessed a total of 67 patients once, twice or three times at monthly intervals.

Results: Ten items formed two highly homogenous subscales reflecting Social skills (Soc) and Excitation/Aggression (E/A). Depression and Clinical Global Impression (CGI) items were considered separately. The correlation pattern suggested that the ratings had construct validity. A cluster analysis identified three patient subgroups, of which one had very high E/A scores. Comparisons with reference data suggested that the average symptom level was on par with acutely admitted in-patients for this subgroup. In all groups, E/A symptoms varied considerably over time, the other symptoms were more stable. There were marked differences among the eight SH units with respect to the level of patient problems.

Conclusions: The SH staff was able to produce valid FAST-O assessments. There are reference data which makes it possible to characterize individual patients as well as SH units with respect to treatment needs and safety aspects (for instance risk of violence).

Introduction
The process of closing mental hospitals was completed in Sweden by law in 1995 [1–4]. At present there are only approximately 35 hospital beds per 100 thousand inhabitants (excluding forensic psychiatric beds), which according to OECD is lowest in Europe (http://www.oecd.org/social-issues-migration-health/psychiatric-care-beds-2014). For those who do not recover enough to live independently, some are offered Sheltered housing (SH), some are cared for in nursing homes. Sheltered housings are run by the local municipalities. There is no in-house psychiatrist – each patient has his/her own external physician, and many of these are non-psychiatrists. Given the circumstances, one might expect problems for the SH patients as well as the staff. Treatment cannot be tailored to the individual needs and improvement as well as destabilization might go unnoticed [5,6]. Staff without proper theoretical education and training may feel help-less or over-whelmed or, in worst case, approach burnout [7,8]. In such settings there is a need for a simple observation tool for assessing patients, monitoring them over time and to evaluate effects of interventions like changes in routines or drugs.drug doses. Furthermore, there is a need for guide-lines for when a patient is too ill to be cared for at the unit - such guide-lines can be established by comparison with patients in other relevant units [9].

The 12-item FAST-O instrument [10] is an observation scale by which patients can be characterized with respect to four dimensions: Social functions (five items), Excitation/Aggression (which is one of the PANSS/PECC pentagonal dimensions [11], also five items), Depression/suicidality and Global degree of illness [12]. In a series of studies we explored psychometric aspects and the clinical usefulness of the instrument – and reference data were established for different clinical groups [10]. These reference data are expressed as percentile scores. Such scores are meterized on the interval scale level, meaning that differences (including intra-individual changes) can be quantified as absolute numbers. It is possible to specify fixed thresholds which are associated with alarm functions, e.g. signals that the patient should be referred to specialist psychiatric services or that precautions should be taken to reduce the risk of acting out.

The aims of the current study were
1. To verify that the staff of the SH units are able to use the FAST-O instrument and produce consistent and meaningful assessments.

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3. To study the variability over time of the four assessment patients and staff and behaving in response to suggestions of situations, while eating, interacting socially with other assessor should be able to observe the patient in a number the patient during the preceding 24 h. During this time the of CGI it is 1

I/A control a 52 25 8 8 8
Cooperation 51 13 18 9 9
Tension 40 34 10 6 9
Excitation 57 18 12 10 3
Hostility 66 16 8 5 6
Excitation 57 18 12 10 3
Depression 60 15 21 2 3
Depression 60 15 21 2 3
Social interest 31 28 25 12 3
Social interest 31 28 25 12 3
Speech 40 31 18 8 3
Speech 40 31 18 8 3
Self-care 39 36 12 10 3
Self-care 39 36 12 10 3
Table manners 55 28 12 0 3
Table manners 55 28 12 0 3
Dressing 48 31 8 12 2
Dressing 48 31 8 12 2

2. To document the illness level and its variability among the patients and compare them to four reference groups of psychiatric patients [9].

3. To study the variability over time of the four assessment dimensions. Without variability it is pointless to use the instrument for monitoring purposes.

4. To study the variability among different SH units with respect to the severity of illness of their patients. This should have bearing on the allocation of staff and other resources.

Table 1. Distribution of scores in percent for twelve items of FAST-O for 67 Sheltered housing patients.

<table>
<thead>
<tr>
<th>Item/Score</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dressing</td>
<td>48</td>
<td>31</td>
<td>8</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Self-care</td>
<td>39</td>
<td>36</td>
<td>12</td>
<td>10</td>
<td>3</td>
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<td>Table manners</td>
<td>55</td>
<td>28</td>
<td>12</td>
<td>0</td>
<td>3</td>
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<tr>
<td>Speech</td>
<td>40</td>
<td>31</td>
<td>18</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Social interest</td>
<td>31</td>
<td>28</td>
<td>25</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Depression</td>
<td>60</td>
<td>15</td>
<td>21</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Hostility</td>
<td>66</td>
<td>16</td>
<td>8</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Excitation</td>
<td>57</td>
<td>18</td>
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<tr>
<td>Tension</td>
<td>40</td>
<td>34</td>
<td>10</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Cooperation</td>
<td>51</td>
<td>13</td>
<td>18</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>I/A control*</td>
<td>52</td>
<td>25</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

*Impulsivity/aggression.

2. To document the illness level and its variability among the patients and compare them to four reference groups of psychiatric patients [9].

3. To study the variability over time of the four assessment dimensions. Without variability it is pointless to use the instrument for monitoring purposes.

4. To study the variability among different SH units with respect to the severity of illness of their patients. This should have bearing on the allocation of staff and other resources.

**Ethics**

The study was approved by Regional Ethics Committee in Lund.

**Method**

**Participants**

Thirteen Scania Sheltered housing (SH) units were invited to participate in the study. Eight delivered a minimum of four patients each. There were 67 patients who were assessed at least once, 40 were assessed twice (one month between assessments) and 20 patients were assessed three times. In addition, separate assessments were done in cases of clinical deterioration or acting-out behavior (16 instances). All SH units were sex mixed - there were 40 men and 27 women. Median age was 45, range 21–69. Patients were usually referred to the SH unit after a short period as psychiatric inpatients. A large majority (82%) of the patients were diagnosed with schizophrenia, of whom around 50% of the men and 25% of the women had a history of abuse, in most cases mild or moderate abuse of multiple substances (ICD-10 F19.1).

**The FAST-O rating scale**

The FAST-O scale [10] comprises 12 items (see Table 1) including an assessment of CGI (Clinical Global Impression [12]). The response format for the eleven first items is 0–4, for CGI it is 1–7. The ratings are based on information about the patient during the preceding 24 h. During this time the assessor should be able to observe the patient in a number of situations, while eating, interacting socially with other patients and staff and behaving in response to suggestions and requirements.

Previous FAST-O factor analyses suggest that there are two homogenous subscales, one reflecting Social functions and the other Excitation/Aggression symptoms, in the following denoted Soc and E/A subscales, respectively. The Depression/Suicidity item is treated separately, as well as the CGI score (ibid).

The outcome of the assessment procedure are the actual scores of items and subscales, and, for each of these, percentiles relative a set of reference groups.

**Reference groups**

Four inpatient reference groups are described in detail in a previous publication [10]. In addition, comparison data for the Depression, E/A and CGI indices were available from the 5-year study, \( N = 165 \) [13], and the AfterCare study, Forensic, \( N = 187 \), Non-forensic, \( N = 122 \) [14]. These patients are representative of well managed out-patients with a schizophrenia-related psychotic illness, for the forensic patients with support by mandated out-patient control for drug abuse and medication adherence.

1. Psychiatric Intensive Care Units (PICU) patients at admission (\( N = 89 \)). These patients were admitted acutely to one of five PICU units in the Scania region. Approximately 50% were diagnosed with schizophrenia, 25% with other psychoses and the remaining patients with non-psychotic disorders.

2. PICU after two weeks (\( N = 70 \)). The same patients were assessed at transfer to a lower level of care or after 14 days, in four of the five PICU units (one unit could not participate for administrative reasons).

3. Forensic chronic (\( N = 33 \)). Data for these patients were collected as part of a pre-study to the main study [10]. Most of them were diagnosed with schizophrenia and were cared for in a secure unit at the Forensic Psychiatric Clinic in Malmö.

4. Forensic patients admitted acutely because of violation of rules or decompensation (\( N = 20 \)). These patients were studied at a forensic PICU unit in Malmö.

**Training of assessors**

SH staff from eight units were gathered for an instruction day with FAST-O instructors (nurse and psychiatrist), which was held at two different occasions. After introducing FAST-O to the participants, they were trained to assess three cases (actors) presented via video. Then the cases and ratings were discussed. This procedure was identical to the one used in previous studies [10].

**Results**

**Items and scales**

Scores of the twelve items at study entry (\( N = 67 \)) are displayed in Table 1. Two scales were created, in line with previous studies, summing items 1–5 to a Social problems scale.
(Soc), and items 7–11 to an Excitation/Aggression scale (E/A). The homogeneity (intra-class correlations, single measure) was excellent: 0.52 for Soc and 0.75 for E/A. These indices shared <35% of the variance. Depression and CGI were kept as items in the analyses. The R of the linear regression of Soc and E/A on CGI was 0.83 - Depression did not contribute.

**Comparisons with the four inpatient reference groups**

The outcome of the comparison of the SH group with the four inpatient reference groups is presented in Table 2. It should be interpreted in the following way, starting with the top left value of 18. Among the SH patients 18% are more ill with respect to depression, and 82% are less ill than the average (median) PICU patient at admission. Values larger than 50 signify that the SH patients are more ill than the average comparison patient - note that this is the case for two of the E/A scores and two are close to 50. Still the CGI comparisons favor the SH patients as being less ill.

**Stability of the FAST indices over time**

Stability was assessed as changes in the four FAST indices over time. Forty patients were assessed twice with a one month interval, 20 were assessed a third time after another month. The correlation between the first and the second assessment was .54 for depression, .69 for CGI, .53 for Soc and .28 for E/A. That means that barely 10% of the variance of the E/A assessments was shared over one month of time. Thus, E/A scores varied considerably over one month.

**Are there homogenous subgroups of SH patients?**

This issue was analyzed by the K-means Cluster method (SPSS 22.0) using the four FAST-O indices. The best solution was obtained with three clusters yielding groups of 27, 30 and 10 patients. Percentile scores, relative recently admitted PICU patients for the three cluster groups are displayed in Figure 1. In addition, the corresponding percentiles are shown for 16 patients who were assessed because of acute decompensation. Among Cluster 1 patients, social symptoms appear to be the main problem. The Cluster 2 patients appear to be more or less problem-free. The Cluster 3 patients are continuously more ill than 85% of recently admitted PICU patients and also more ill than the acutely decompensated SH patients. These patients had a mean E/A percentile score of 25 before decompensating, i.e. a substantial increase in such symptoms.

**Differences among the SH units**

If there are large differences in terms of symptoms/degree of illness of the patients among the different SH units, then that ought to be reflected in corresponding differences in staffing and routines. The symptoms/illness scores were analyzed for the eight SH units which, as far as we know, did not differ much in these respects. There were substantial and significant differences among the eight units – five (N = 41) had a rather low load; three (N = 26) a very high load (Units 2, 7 and 8). Percentile scores for these groups of SH units is displayed in Figure 2. All differences were significant (t-test), particularly for E/A. Separate t-test analyses for each of the five E/A items yielded highly significant differences for all (t-values ranged between 3.55 and 4.15). Thus, the most ill patients aggregate to some SH units.

**Discussion**

The FAST-O item scores appeared to be reliable and meaningful by being highly consistent, e.g., the global assessment of illness was (almost 70% shared variance) a linear sum with equal weight of scores of the two FAST-O scales, and there were high correlations over time for three of the main indices. The Sheltered housing (SH) staff is able to do good FAST-O assessments in spite of limited education and only a short training session. The SH patients are quite ill, particularly with respect to high Excitation/Aggression scores, in comparison with the reference groups. On top of that, SH
patients are not stable in that respect over time - this problem comes and goes and has to be handled day-by-day by the local staff.

The SH patients were quite heterogeneous as shown by the cluster analysis. The two smaller clusters appear to be real challenges to the staff, more ill than the median of any of the comparison groups, including patients just admitted to a Psychiatric Intensive Care Unit (PICU). It raises the issue whether many of the SH patients have a need for qualified in-patient care rather than living in a low-resource SH unit, particularly when considering the substantial changes in E/A problem level over time.

The Bröset Violence Checklist (BVC) was constructed as short term risk assessment tool in care units with a high base rate of acting-out [15]. The E/A subscale, based on 24 h of observations and predicting the problem in the following week should be possible to use in the same way as BVC.

Percentile values based on norm or comparison data have distinct advantages compared to sum-scores for instance those presented in the PANSS manual. Percentiles are easy to understand, and represent interval scale data, which makes it possible to do absolute comparisons, between groups or within an individual for monitoring purposes (improvement/worsening). On item level a percentile value is of limited use because of the small range (0–4). On scale level (potential range 0–44) it is usually meaningful.

There was a large variation in terms of the average degree of illness and consequent problems among the different SH units. It would be rational to use such information when staffing an SH unit and dimension the professional support for the staff. This is one use of the FAST-O instrument. If there are substantial changes over time of individual patients with respect to the most difficult problem (E/A) then FAST-O can be used to monitor the problem level of an SH unit – and actions taken if needed. Finally, FAST-O can be used to place patients - to avoid aggregation of too many "challenging" patients to one SH unit.

When patients decompensated, E/A symptoms increased substantially, to a mean level corresponding to a percentile of limited use because of the small range (0–4). On scale level (potential range 0–44) it is usually meaningful.

One might expect that there are a many research reports covering the problem of SH patients, too ill for living independently in the society and no available psychiatric hospital beds [16]. In the last two years there is one! [17].

Summing up, FAST-O is simple enough to be used by rather naive assessors and they still deliver reliable and valid assessments of relevant indices. It can be used by the authorities to plan and monitor overall services, and by the psychiatric services and municipal care-givers on all levels to monitor individual patients and service units. By having a common tool, backed up by reference materials, communication will improve among agents with widely varying professional back-grounds, specifically SH units and in-patient psychiatric ones.

Acknowledgments
No support was obtained in spite of several applications. The instrument can be downloaded, and percentile values for inpatients and forensic and non-forensic outpatients can be obtained at the Medicoo home-page.

Disclosure statement
No potential conflict of interest was reported by the authors.

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