Auditory hallucinations in childhood
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Document Version
Publisher's PDF, also known as Version of record

Publication date:
2011

Link to publication in University of Groningen/UMCG research database

Citation for published version (APA):

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Chapter 6

The psychometric evaluation of the Auditory Vocal Hallucination Rating Scale (AVHRS)

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Jack A. Jenner
Durk Wiersma

Submitted for publication
Abstract

The Auditory Vocal Hallucination Rating Scale (AVHRS) was examined in adult patients’ and non-clinical children’s samples: inter-rater agreement scores were 0.84 respectively 0.88 (Cohen’s kappa) and internal consistency (Cronbach’s alpha) was 0.84 (adult sample), respectively 0.77 (children’s sample). The AVHRS is a comprehensive and useful interview for clinical and research settings.
Introduction

Assessing characteristics of auditory vocal hallucinations (AVH) is a key issue in clinical practice and research. The Auditory Vocal Hallucination Rating Scale (AVHRS; Jenner and Van de Willige, 2002) has been developed since 1996 and has been used both for clinical adolescent and adult patients (Jenner and Van de Willige, 2001; Van de Willige et al., 1996) and for non-clinical children (Bartels-Velthuis et al., 2010). The aim of this study is to examine some essential psychometric properties of the AVHRS.

Methods

At the Voices Outpatient Department (VOPD), the Auditory Hallucination Rating Scale (AHRS) was developed to examine the effectiveness of therapy (Van de Willige et al., 1996). Items were derived from clinical practice, from symptom characteristics formulated in the Schedules for Clinical Assessment in Neuropsychiatry (SCAN; Wing et al., 1990) and from DSM-IV (American Psychiatric Association, 1994).

In a population based survey among 7- and 8-year-old children to assess prevalence and characteristics of AVH (Bartels-Velthuis et al., 2010), the initial AHRS was combined with items of the PSYRATS-AHS (Haddock et al., 1999), resulting in the Auditory Vocal Hallucination Rating Scale (AVHRS; Jenner and Van de Willige, 2002; see Appendix 2). In addition, three items were added: (i) voices talking separately or simultaneously, guided by the observations that patients’ suffering increases when voices are talking simultaneously; (ii) hypnagogic and/or hypnopompic hallucinations (HHH), which might be regarded as non-pathological and not uncommon in accompanying narcolepsy (DSM-IV; American Psychiatric Association, 1994), but still might elicit anxiety and distress; (iii) form of address of voices (talking in the first, second or third person), as particularly third person voices (talking about the patient or commenting on patient’s activities, two of Schneider’s first rank symptoms [Schneider, 1957]) are related to schizophrenic disorders.

The AVHRS is a structured 16-item interview, to evaluate patient’s experiences during the past month. Each item consists of a compulsory question, followed by optional support questions. Items are scored on a 5-point scale, ordered in increasing severity. Scores are added to compute a severity index from all items, except those on HHH (this score would duplicate other items) and on localization of voices (which was shown to have no intrinsic effects on severity [Copolov et al.,
For experienced therapists and researchers no training in administering the AVHRS is required. Duration of the interview is around 20 minutes. Copies of the AVHRS are available in English, Spanish and Dutch and can be downloaded from http://www.rgoc.nl/#home/downloads.

Data from two samples were analysed: (1) adult VOPD patients (n = 62); (2) non-clinical children with auditory hallucinations (n = 347) from a representative sample of 3870 children, aged 7-8 years (Bartels-Velthuis et al., 2010).

To establish inter-rater agreement, 23 successive interviews from sample 1 were observed by four raters. The Dutch Central Committee on Research involving Human Subjects does not allow inter-rater agreement assessments in children’s samples. Therefore, for inter-rater agreement assessment in the 5-year follow-up study of sample 2, each of the eight interviewers rated five DVD-recorded interviews of VOPD patients. All patients gave their opinion about the AVHRS. Inter-rater agreement was analysed using Agree-6 for Windows (Popping, 1983). Measure of agreement was (Cohen’s) kappa. Internal consistency (Cronbach’s alpha) was analysed with SPSS 16 for Windows.

**Results**

The inter-rater agreement scores in the agreement studies were 0.84 respectively 0.88 (Cohen’s kappa), and the respective internal consistency scores (Cronbach’s alpha) were 0.84 and 0.77 (Table 1).

**Discussion**

The psychometric properties of the AVHRS are shown to be good, with an ‘excellent’ inter-rater agreement (Altman, 1995) and a ‘good’ internal consistency (Feinstein, 1987).

In daily clinical practice the AVHRS has proven to be a useful instrument as a starting point for therapeutic interventions, as patients appreciated having been interviewed about their voices in a clear, thorough and recognizable way, thus adhering therapy compliance (Cohen and Berk, 1985). Besides, it might be assumed that a quick assessment of AVH with a self-report questionnaire will be useful in treatment studies. Recently, self-administered questionnaires in this field have been published (Hayward et al., 2008; Hoffman et al., 2008; Pinto et al., 2007), which either seem to be less complete (Hoffman et al., 2008; Pinto et al., 2007) or lack well established psychometric properties (Hoffman et al., 2008) or only assess a person’s relationship with their predominant voice (Hayward et al.,
Therefore, the feasibility of a self-report version of the AVHRS is currently being explored.

**Table 1.** Characteristics of participants and psychometric outcomes of the Auditory Vocal Hallucination Rating Scale

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Sample 1</th>
<th>Sample 2</th>
<th>Five-year follow-up study of Sample 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patients VOPD Subsample of VOPD patients for inter-rater agreement AVH+ children prevalence study Subsample of VOPD patients for inter-rater agreement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>number</td>
<td>62</td>
<td>23</td>
<td>347</td>
</tr>
<tr>
<td>% female</td>
<td>55</td>
<td>83</td>
<td>49</td>
</tr>
<tr>
<td>mean SD (range)</td>
<td>37.2 12.6 (13-62)</td>
<td>38.7 11.4 (13-62)</td>
<td>8.0 0.46 (7-9)</td>
</tr>
<tr>
<td>age (years)</td>
<td>11.9 9.6 (0.5-36.0)</td>
<td>13.3 10.1 (0.5-30.0)</td>
<td>not assessed</td>
</tr>
<tr>
<td>duration of AVH (years)</td>
<td>11.9 9.6 (0.5-36.0)</td>
<td>13.3 10.1 (0.5-30.0)</td>
<td>not assessed</td>
</tr>
<tr>
<td>Outcome measures</td>
<td>Internal consistency (Cronbach’s alpha) Inter-rater agreement (Cohen’s kappa) Internal consistency (Cronbach’s alpha) Inter-rater agreement (Cohen’s kappa)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.84</td>
<td>0.84 (4 raters)</td>
<td>0.77</td>
</tr>
</tbody>
</table>

VOPD = Voices Outpatient Department; AVH+ = with Auditory Vocal Hallucinations; SD = Standard Deviation.
+ past month assessment.
* past year assessment.

Some limitations are apparent. Firstly, though the AVHRS has proven to measure effects of therapy, sensitivity to change has not yet been assessed. Secondly, generalizability of the results may be a subject of debate. On the one hand, a sample of chronic patients was assessed, so results may not be generalized to other, e.g. acute first episode, patients. On the other hand, a general population sample of non-clinical children was studied. As the instrument appeared to be suitable in both divergent samples, it might be inferred that the AVHRS is suitable in a broad range of population samples.

Strength of the study is that in the research period no ‘less suitable’ patients were excluded. Likewise, all 7-and-8-year-olds were assessed with the AVHRS. Also, the severity index has shown its usefulness (Bartels-Velthuis et al., 2010). Comparing the AVHRS with other instruments in this field (Carter et al., 1995; Haddock et al., 1999; Chadwick et al., 2000; Escher et al., 2002a), we conclude that this interview is compact but complete, showing good psychometric properties.