Research Article

The Aggression and Vulnerability Scale (AVS) for the Measurement of Inpatient Behaviors: A Demonstration of Reliability

Gray NS[1], Raybould S[2], McKinnon A[2,3] and Snowden RJ[3]*

[1]Department of Medicine, University of Swansea, UK
[2]Department of TyCartin, University of Cardiff, UK
[3]Department of Psychology, University of Cardiff, UK

*Corresponding author: Robert Snowden, Department of Psychology, University of Cardiff, Wales, UK

Abstract

Background: The accurate and consistent recording of problematic incidents for in-patient behaviour is important in monitoring patient's treatment and needs, and for comparing behaviour across different settings.

Methods: The Aggression and Vulnerability Scale (AVS) classifies individual incidents into 10 categories covering aggression (Physical Aggression against Other People, Verbal Aggression, Aggression against Property, Non-Compliant Behaviour) and vulnerabilities (Self-Harm/Suicide Attempt, Self-Neglect, Victimized/Exploited, Sexual Vulnerability, Absconding Behaviour and Accident) and rates severity of the incident. Twenty raters (10 naïve and 10 experienced) rated 28 vignettes drawn from nursing records.

Results: The AVS had high reliability for both classification category and severity in both experienced and inexperienced raters.

Conclusion: The AVS is a reliable scheme for the coding of problematic behavior in an in-patient setting. The AVS is available free from the authors.

Keywords: Aggression; Self-harm; Suicide; Neglect

Introduction

Challenging behaviors, and in particular aggression to the self or others, are a powerful patient variable that governs admission and discharge to psychiatric units or forensic settings, levels of care, security and observation levels within an institute. Changes in these behaviors can be used as objective measures of treatment response or deterioration and therefore evidence the effectiveness of psychiatric and psychological interventions. As such, many institutions and agencies have put together their own measurement systems. However, there would be great advantage if organizations used the same standardized measures, as patient behaviour could then be compared from one institution to another at both the level of a single patient, or as a group of patients (e.g., ward by ward, or across institutions).

There have been some attempts to produce such a standardized scale. The Overt Aggression Scale (OAS: [1] was designed to classify aggressive behaviors. It divides the behaviors into four categories: 1) verbal aggression. 2) Physical aggression against objects. 3) Physical aggression against the self and 4) physical aggression against others. Once classified, the incident is then rated in terms of severity within this category on a four-point scale, with standardized descriptions of each level provided on the form. The Staff Observation Aggression Scale (SOAS [2] and its update (SOAS-R [3]) classifies an aggressive incident on a five-point scale (provocation, means used, target, consequences for victim, and measures used to stop aggression). Both of these scales have demonstrated their reliability, and have gone on to be used in many research and clinical settings, showing the value of such classification schemes [4,5]. However, these schemes are limited to aggressive acts and there is a need for a scheme that covers a wider range of incidents that challenge behavioural management of psychiatric patients. We also found in our early work using the OAS that the four-point classification of aggression was too limited within the setting of the secure units within which we were working and a scheme with a finer gradation of responses was needed.

In the present paper, we describe data on a behavioural classification scheme, the Aggression and Vulnerability Scale (AVS), which we developed over several years. The AVS uses the same approach as the OAS but is aimed to classify a much wider range of problem behaviors that extend beyond aggression. The AVS is designed to be completed whenever there is an incident of challenging behaviour that would be problematic either for the patient or for the staff working with them. The instrument is completed by a staff member who observed the incident or obtained information from witnesses or written records. The incident is classified into one of 10 categories that cover aggression (Physical Aggression against Other People, Verbal Aggression, Aggression against Property, Non-Compliant Behaviour) and vulnerabilities (Self-Harm or Suicide Attempt, Self-Neglect, Victimized or Exploited, Sexual Vulnerability, Absconding Behaviour, Accident or Other Incident of Note). The individual then scores the severity of the incident on an ordinal scale with increasing levels of severity represented by higher numbers. Each category is accompanied by a brief description of behaviors of each severity. The severity scales are ordinal but the numbers are arbitrary and are not equivalent across the scales – i.e. a "4" on the Self-Harm scale is not intended to have the same level of severity as a "4" on any other scale. Indeed, the severity scales have different maximum scores (range 5 – 13).

Table 1: Demographic information about the two groups.

Participant Demographics	Experienced				Inexperienced			
Variable	M	SD	Range	n	M	SD	Range	n
Age**	33.6	12.4	23-63	10	19.8	2.3	18-24	10
Sex*								
Men	5				2			
Women	5				8			
Experience using AVS (years)**	2.9	1.1	1.5-5		0			
*p < .05								
**p < .001								

There is also place on the form to record some of the details of the incident including time, location, and victims. Finally, we also have space for an ABC functional analysis [6], though we do not regard this as an integral part of the AVS and others may prefer a different format for recording the details of the incident.

In this paper we report on a test of the reliability of this scheme, and offer some data on its validity.

Methods and Materials

All procedures were given ethical permission from the School of Psychology, Cardiff University (EC.10.12.07.2705R).

We selected a consecutive series of 28 recorded incidents extracted directly (word for word) from the nursing records of ward-based incidents. Each rater was presented the anonymised vignettes in one of four random orders. They were asked to complete the AVS as they would in real-life – where a single incident might lead to more than one AVS classification (i.e., a person might self-harm and then hit a nurse trying to treat them).

We had two groups of raters. The first (N = 10) were undergraduate students with no experience in using the AVS or managing psychiatric patients. We refer to the undergraduates as the "inexperienced" group. They were given a copy of the AVS manual and 20 minutes in which to familiarize themselves with its use, including completion of two practice vignettes. They then classified the 28 test incident vignettes. The second group (N = 10) were staff members at a low secure psychiatric unit (Ty Catron, UK). The staff members were recruited if they had over one year of experience of working at the organization and using the AVS. They followed the same protocol as the inexperienced group. Demographic information about the two groups is presented in (Table 1).

Results and Discussion

As recommended [7,8], the kappa statistic was calculated for each rater pair and summary statistics were calculated on these kappa values. The average kappa value was .753 (95% CI .624 –.898; range .623 - .966, all ps< .001). In qualitative terms, kappa values of .61 – .80 are regarded as "substantial agreement" [9]. We note that this estimate is likely to be somewhat lower than the true value due to the "prevalence problem" [10] which occurs when the categories are not approximately equally distributed. A comparison of rater groups showed that the experienced group had greater kappa scores (M = .769) than the inexperienced group (M = .734), t (88) = 2.09, p< .05.

To test the reliability of the severity ratings, we first eliminated data that was classified incorrectly ("correct" was decided by "expert" raters including the author NSG). The average ICC (two-way random effects model with absolute agreement; [11] was very high and similar for both groups (experienced = .979, inexperienced = .977, ps< .0001).

The data show that the AVS was scored reliably both in terms of the classification of the type of incident and the severity given to this incident. However, there are some limitations. First, we based this on a representative sample of consecutive incidents within a particular psychiatric unit. Some incidents (e.g., self-harm) are strongly represented in this sample whereas others had only a single incident (e.g., Accident or other Incident of Note). Hence, we cannot establish that each scale has reliability. Second, the demonstration that people can reliably use this instrument is not a guarantee that they will use the instrument at all. Clearly, issues of the implementation of the AVS or any other scheme are immensely important for the scheme to be effective in achieving the aims of a consistent and careful coding of patients' behaviour.

We have used the AVS for over 5 years in a specialized secure unit for patients with personality disorder and have found the results valuable in monitoring behavioural changes in individual patients, and demonstrating clinical effectiveness for clinical case conferences, tribunals, etc. We have used the AVS in research projects across a range of psychiatric samples [12]. As the AVS goes beyond just measuring aggression, it can be used in studies that look at the prediction of a wide range of institutional challenging behaviors. For example, in [13] we used the AVS scheme as our dependent measure to test the predictive validity of the Short-Term Assessment of Risk and Treatment (START) [14] which aims to predict a wide-range of patient behaviors and needs. These earlier studies, which show a strong relationship between risk assessment instruments and behaviour as accessed via the AVS, effectively provide the AVS with "validity" to accompany the "reliability" demonstrated in the present paper. The AVS manual and rating forms are available from the corresponding author at no cost.

Conclusion

The AVS provides a simple and reliable method for coding problematic in-patient behaviour in order to quantify behaviour and track behavioural changes.

References

1. Yudofsky SC, Silver JM, Jackson W, Endicott J, Williams D. The Overt Aggression Scale for the objective rating of verbal and physical aggression. Am J Psychiatry. 1986; 143: 35-39.

2. Palmstierna T, Wistedt B. Staff observation aggression scale, SOAS: presentation and evaluation. Acta Psychiatr Scand. 1987; 76: 657-663.

3. Nijman HL, Muris P, Merckelbach H, Palmstierna T, Wistedt B, Vos AM, et al. The Staff Observation Aggression Scale-revised (SOAS-R). Aggressive Behavior. 1999; 25: 197-209.

4. Nijman HL, Palmstierna T, Almvik R, Stolker JJ. Fifteen years of research with the Staff Observation Aggression Scale: a review. Acta Psychiatr Scand. 2005; 111: 12-21.

5. Golomb BA, Dimsdale JE, Koslik HJ, Evans MA, Lu X, Rossi S, Mills PJ. Statin Effects on Aggression: Results from the UCSD Statin Study, a Randomized Control Trial. PLoS One. 2015; 10: e0124451.

6. Bijou SW, Peterson RF, Ault MH. A method to integrate descriptive and experimental field studies at the level of data and empirical concepts. J Appl Behav Anal. 1968; 1: 175-191.

7. Hallgren KA. Computing Inter-Rater Reliability for Observational Data: An Overview and Tutorial. Tutor Quant Methods Psychol. 2012; 8: 23-34.

8. Light RJ. Measures of response agreement for qualitative data - some generalizations and alternatives. Psychological Bulletin. 1971; 76: 365.

9. Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics. 1977; 33: 159-174.

10. Di Eugenio B, Glass M. Squibs and discussions - The kappa statistic: A second look. Computational Linguistics. 2004; 30: 95-101.

11. Shrout PE, Fleiss JL. Intraclass correlations: uses in assessing rater reliability. Psychol Bull. 1979; 86: 420-428.

12. Fitzgerald S, Gray NS, Alexander RT, Bagshaw R, Chesterman P, Huckle P, et al. Predicting Institutional Violence in Offenders with Intellectual Disabilities: The Predictive Efficacy of the VRAG and the HCR-20. Journal of Applied Research in Intellectual Disabilities. 2013; 26: 384-393.

13. Gray NS, Benson R, Criag R, Davies H, Fitzgerald S, Huckle P, et al. The Short-Term Assessment of Risk and Treatability (START): A prospective study of inpatient behavior. International Journal of Forensic Mental Health. 2011; 10: 305-313.

14. Webster CD, Martin ML, Brink J, Nicholls TL, Middleton C. Short-term assessment of risk and treatability (START). Hamilton, Ontario, Canada: St Joseph's Healthcare. 2004.

Citation: Gray NS, Raybould S, McKinnon A and Snowden RJ. The Aggression and Vulnerability Scale (AVS) for the Measurement of Inpatient Behaviors: A Demonstration of Reliability. Austin J Psychiatry Behav Sci. 2015; 2(3): 1045.