




## Ward Climate in a High-Secure Forensic Psychiatric Setting: Comparing Two Instruments

Meike Godelieve de Vries<sup>a</sup>, Inti Angelo Brazil<sup>a,b,c,d</sup> , Peer van der Helm<sup>e</sup>, Robbert-Jan Verkes<sup>a,f,g</sup>, and Berend Hendrik Bulten<sup>a,h</sup>

<sup>a</sup>Division Diagnostics Research and Education, Forensic Psychiatric Centre Pompestichting, Nijmegen, The Netherlands; <sup>b</sup>Donders Institute for Brain, Cognition and Behaviour, Radboud University, Nijmegen, The Netherlands; <sup>c</sup>Collaborative Antwerp Psychiatric Research Institute, University of Antwerp, Antwerp, Belgium; <sup>d</sup>Centre for Psychology, Behaviour, & Achievement, Faculty of Health and Life Sciences, Coventry University, UK; <sup>e</sup>Hogeschool Leiden, Youth Expert Centre, Leiden University of Professional Sciences, Leiden, The Netherlands; <sup>f</sup>Department of Criminal Law, Law School, Radboud University, Nijmegen, The Netherlands; <sup>g</sup>Radboud University Medical Centre, Donders Institute for Brain, Cognition and Behaviour, Nijmegen, The Netherlands; <sup>h</sup>Behavioural Science Institute (BSI), Radboud University, Nijmegen, The Netherlands

### ABSTRACT

The psychometric properties and associations between the Essen Climate Evaluation Schema (EssenCES) and the Group Climate Instrument-revised (GCI-r) were examined. These self-report questionnaires assessing ward climate were filled out by 123 male patients, residing in 3 high-secure forensic psychiatric facilities. Good internal consistency was found for all subscales of both instruments. The original factor structure was confirmed for the EssenCES, but not for the GCI-r. Bivariate correlation analyses indicated that the instruments measure related concepts. The results of this study call for further development and validation and for finding common grounds in the definition and operationalization of ward climate.

### KEYWORDS

EssenCES; GCI-r; ward climate; self-report measures; psychometric properties

### Introduction

It has long been recognized that ward climate or atmosphere plays an important role in the efficacy of treatment in psychiatric hospitals (World Health Organization, 1953). However, in residential climate research there is still a lack of conceptual clarity, no consensus on the definition, on the appropriateness of the terminology used and on the essential elements of the construct (Doyle, Quayle, & Newman, 2017; Tonkin, 2015). Ward climate or social climate is often used as a term to refer to the material, social, and emotional conditions of a particular unit and the interaction between such factors (Moos, 1989), which may influence the mood, behavior and self-concept of the people involved (Milsom, Freestone, Duller, Bouman, & Taylor, 2014; Schalast, Redies, Collins, Stacey, & Howells, 2008). It is seen as a dynamic and multifactorial construct, which describes the social and emotional experience of a unit by its staff or residents (Schalast et al., 2008; Tonkin, 2015).

Having an optimal ward climate has been described as a prerequisite for fostering program responsiveness

and enhancing patient treatment readiness (Howells & Day, 2003; Ward, Day, Howells, & Birgden, 2004). There is a growing body of research on ward climate, demonstrating that positive ward climate often co-occurs with positive organizational and therapeutic outcomes in inpatient forensic psychiatric care. For instance, the quality of ward climate is found to be related to motivation to engage in treatment, coping, and therapeutic alliance (Beazley & Gudjonsson, 2011; Day, Casey, Vess, & Huisy, 2011; Long et al., 2011; van der Helm, Beunk, Stams, & van der Laan, 2014), staff and patient satisfaction (Bressington, Stewart, Beer, & MacInnes, 2011), self-reported aggression and aggressive incidents (van der Helm, Stams, van Genabeek, & van der Laan, 2012; Ros, van der Helm, Wissink, Stams, & Schaftenaar, 2013; de Decker, Lemmens, van der Helm, Bruckers, Molenberghs, & Tremmery, 2018), and recidivism (Schubert, Mulvey, Loughran, & Losoya, 2012). It is important to note that the studies referred to above do not present a unidirectional causal relationship between ward climate and therapeutic outcomes.

Despite the lack of insight in causality, the relationships found between ward climate and therapeutic and organizational outcomes make ward climate an important concept for forensic psychiatric facilities to monitor. Moreover, the Dutch government underlines the importance of a safe and humane climate that encourages self-reliance and a safe return to society, in its policy for correctional settings (Boone, Althoff, & Koenraadt, 2016). As in the Netherlands, international institutions put effort into monitoring ward climate as a standard practice to inform on-going quality improvement (Day et al., 2011; Milsom et al., 2014; Schalast & Laan, 2017; Tonkin, 2015). Nowadays, relatively short questionnaires are preferred and used to monitor and compare ward climate and to guide clinical practice. One example of this type of instrument is the Essen Climate Evaluation Schema (EssenCES; Schalast et al., 2008). The EssenCES was developed for use in forensic psychiatric units. The EssenCES is also available for correctional and prison settings and has been translated into different languages (Schalast & Tonkin, 2016). The psychometric quality of the EssenCES in correctional settings and forensic psychiatric hospitals has been studied and supported several times. However, additional research on its suitability is required for specialized settings such as female units, facilities for juvenile offenders, and forensic facilities for individuals with learning disabilities (Bell, Tonkin, Chester, & Craig, 2017; Tonkin, 2015). The EssenCES measures three aspects of ward climate, namely “Therapeutic Hold”, referring to the extent to which the unit is perceived as supportive of patients’ therapeutic needs; “Experienced Safety”, representing freedom from the threat of aggression and violence; and “Patient Cohesion and Mutual Support” (further referred to as Patient Cohesion), indicating the extent to which characteristics of a therapeutic community are approximated on a unit.

A second example of a relatively short questionnaire developed to monitor ward climate is the Group Climate Instrument revised (GCI-r) derived from the Prison Group Climate Inventory (PGCI; van der Helm, et al., 2011). The PGCI was developed to measure group climate in youth prisons and secure residential treatment facilities. There are several versions of the PGCI available for different age categories. It has been translated into several languages, and is used in youth prisons, secure youth care facilities, forensic mental hospitals, adult prisons, and residential care facilities for individuals with learning disabilities (Stams & van der Helm, 2017). The psychometric

quality of the PGCI has been studied and confirmed in, for instance, German youth prison (Heynen, van der Helm, Stams, & Korebrits, 2014) and Dutch youth prison and adult psychiatric prison (van der Helm et al., 2011). The GCI-r assesses four dimensions of ward climate, namely “Support”, referring to responsiveness of staff members to the needs of the patients; “Growth”, reflecting facilitation of learning and preparation for a meaningful life both within and outside the closed facility; “Atmosphere”, capturing the degree to which the physical and social environment fosters feelings of safety and trust among inmates; and “Repression”, which measures a negative side of ward climate encompassing perceptions of strictness and control, unfair rules and boredom, and lack of flexibility on the ward. The sum of the scale scores on the GCI-r is also used as a broad indicator for ward climate (higher-order factor).

Both the EssenCES and the GCI-r are developed to assess ward climate. However, it has yet to be determined whether and to what extent these two instruments diverge or overlap in the aspects of ward climate that they intend to measure. The main goal of the present study was to examine the psychometric properties of the EssenCES and the GCI-r, and the overlap between the instruments, in a Dutch high-secure forensic psychiatric setting. First, statistical indicators for internal consistency of the original subscales were calculated, and confirmatory factor analyses were conducted to test the three-factor structure of the EssenCES (Howells et al., 2009; Milsom et al., 2014; Schalast & Laan, 2017; Schalast et al., 2008; Tonkin, Howells, Ferguson, Clark, Newberry, & Schalast, 2012) and the four-factor structure of the GCI-r (van der Helm et al., 2011; Heynen et al., 2014). Second, the overlap between the instruments was investigated through the pattern of correlations between the subscales. A strong positive relationship was expected between the Therapeutic Hold scale of the EssenCES and the Support scale of the GCI-r, because both factors represent the quality of the relationship between patients and staff members in terms of responsiveness to patients’ needs. The Atmosphere scale of the GCI-r seems to assess elements of both the Experienced Safety and Patient Cohesion scale of the EssenCES, therefore a positive association between these scales was expected. A negative relationship was expected between the Repression scale of the GCI-r and the Therapeutic Hold scale of the EssenCES, as repression measures among other things unfair, repressive behavior by staff members. Because repression is the only aspect aimed at a negative side of

**Table 1.** Demographic and clinical characteristics of the participants.

Characteristic	Result
Gender: male (%)	123 (100%)
Age, years: mean (SD; range)	49 (11.1; 19–73)
Length of stay within facility years: mean (SD; range)	4 (4.09; 0–16)
Main diagnosis: axis I (%)	72 (59.0)
schizophrenia (%)	28 (22.8)
pedophilia (%)	23 (18.5)
pervasive developmental disorders (%)	10 (8.1)
other (%)	11 (8.9)
Main diagnosis: axis II (%)	51 (41)
personality disorder NOS* (%)	22 (17.7)
antisocial personality disorder (%)	16 (12.9)
borderline (%)	7 (5.6)
other (%)	6 (4.8)
Offense which led to mandatory stay (%)	
(attempted) murder	26 (21.1)
(attempted) manslaughter	18 (14.5)
(attempted) aggravated assault	11 (8.9)
sexual offences (e.g., rape, sexual assault)	50 (40.3)
of which child abuse	28 (22.6)
other offences (e.g., arson, robbery)	18 (14.5)

\*NOS = not otherwise specified.

ward climate, negative relationships between the Repression scale of the GCI-r and all other scales (especially with the Support scale of the GCI-r and the Therapeutic Hold scale of the EssenCES) were expected. As possibilities for growth are not explicitly measured by the EssenCES, relatively low correlations were expected between the Growth scale of the GCI-r and the subscales of the EssenCES.

## Material and methods

### Subjects

Data were collected in three facilities of the Pompestichting, one regular in-patient high security forensic psychiatric hospital (RFPC), and two facilities for long-term forensic psychiatric care (LFPC) in the Netherlands. Patients that reside within these facilities are admitted by means of a TBS order (Terbeschikkingstelling: “disposal to be treated on behalf of the state”). All TBS patients are convicted for a serious violent offense but are considered to have diminished responsibility for their crime because of severe psychopathology. Therefore, mandatory stay (and treatment) within a high-secure forensic psychiatric setting is imposed. In the RFPC the focus lies on treatment and rehabilitation. In case multiple treatment attempts in one or more RFPC hospital(s) fail to reduce a patient’s risk of recidivism to safely return to society, patients are transferred to a LFPC facility. Within the LFPC the focus mainly lies on stabilization of psychiatric problems and enhancement of quality of life.

In this study, the overall response rate was 49%, as 123 of the total of 253 patients that resided within the facilities participated. The response rate was 55% for the RFPC facility (as 40 of the total of 140 patients that resided within the hospital participated), and 41% for both LFPC facilities (9 participants from a total of 22 patients; and 37 from a total of 91 patients). Of the respondents, 63% ( $n = 77$ ) resided in RFPC and 37% ( $n = 46$ ) resided in LFPC. The participants resided on 24 different units; 2 admission units, 8 treatment units, 4 rehabilitation units, and 10 units for long stay. All participants committed at least one serious violent or sexual offence and were diagnosed with a serious mental disorder either on Axis I and/or Axis II using the Diagnostic and Statistical Manual of Mental Disorders, version IV-TR (American Psychiatric Association, 2000). See Table 1 for demographic and clinical characteristics.

### Procedure

Data collection was part of the yearly evaluation of ward climate within the Pompestichting and took place in 2015 and 2016. Based on an evaluation of ethical criteria (no negative consequences were associated with participation, participation was voluntary, and filling out two self-report questionnaires was assumed to require minimal effort of the participants), the study protocol was not required to be submitted to an external medical ethic committee. Instead, the protocol was evaluated and approved by the internal review board (Scientific Committee) of the Pompestichting.

The study was conducted in accordance with the Declaration of Helsinki (World Medical Association, 2013). Participation was voluntary and the assessments were anonymized to ensure that participants were not able to be identified from the data. The researcher gave oral and written information concerning the data collection, the study aims, and objectives. Patients signed an informed consent before taking part and were rewarded with €2,35 (payment equal to one working hour within the Pompestichting). All patients received a printed version of the EssenCES and the GCI-r with a return envelope. After filling out the questionnaires participants returned them to the researcher by posting the envelope in a sealed (mail)-box located on the ward. Data on patient characteristics (age, disorder, type of offence) were extracted from the clinical records.

## Measures

The *Essen Climate Evaluation Schema* (EssenCES; Schalast et al., 2008) is a 17-item questionnaire. Examples of items representing the different factors are “*The patients care for each other*” (Patient Cohesion); “*Really threatening situations can occur here*” (Experienced Safety); and “*On this ward, patients can openly talk to staff about all their problems*” (Therapeutic Hold). Several studies provide good empirical support for the psychometric properties of the EssenCES (Schalast et al., 2008; Howells et al., 2009; Tonkin et al., 2012). Tonkin (2015) reported mean Cronbach’s alphas of .82 (PC), .77 (ES), and .81 (TH) in a review of ten studies examining the internal consistency of the EssenCES. In previous research the alpha-coefficients of the Dutch translation of the EssenCES (Bulten & Fluttert, 2007), were very similar: .82 (PC), .76 (ES), and .84 (TH) (de Vries, Brazil, Tonkin, & Bulten, 2016). Ratings were obtained using a 5-point likert scale ranging from “I do not agree” (0) up to “totally agree” (4).

The *Group Climate Inventory revised* (GCI-r; based on the PGCI, van der Helm et al., 2011) consists of 29 items. Examples of items representing the different factors are: “*I get attention from staff members*” (Support); “*I learn the right things here*” (Growth); “*We trust each other here*” (Atmosphere); “*You have to ask permission for everything here*” (Repression). The GCI-r has not yet been validated, because it is a relatively new and shorter version of the validated PGCI (Heynen et al., 2014; van der Helm et al., 2011). Ratings were obtained using a 5-point Likert scale ranging from “I do not agree” (1) up to “totally agree” (5).

## Statistical analyses

Internal consistency of the original subscales was examined using Cronbach’s alpha and Corrected Item Total Correlation (CITC) coefficients. Confirmatory factor analysis (CFA) was used to examine whether the questionnaires’ internal structures are retained within this sample. For the EssenCES, a three-factor CFA was tested by loading the items from each measure into their respective factors. For the GCI-r, a model with four first-order factors and one second-order factor representing overall climate was fitted to the data. The robust maximum likelihood (MLR) estimation procedure was used to account for non-independence and non-normality (Muthén & Muthén, 1998-2011). The fit of the two models was examined using the Root Mean-Square Error of Approximation

**Table 2.** Descriptive statistics EssenCES and GCI-r.

	<i>n</i>	<i>Mean</i>	<i>SD</i>	<i>Range</i>	<i>Alpha</i>
EssenCES* Patient cohesion	118	10.2	4.4	1–20	.78
EssenCES Experienced Safety	116	11.4	5.1	0–20	.78
EssenCES Therapeutic Hold	119	10.8	5.1	0–20	.81
GCI-r** Support	113	3.4	.93	1–5	.92
GCI-r Growth	119	3.2	1.1	1–5	.85
GCI-r Repression	121	3.1	.86	2–5	.74
GCI-r Atmosphere	120	3.3	1.0	1–5	.81
GCI-r Total score	110	3.2	.84	1–5	.95

\*The minimum and maximum total scores that can be obtained for the subscales of the EssenCES are: 0–20.

\*\*The minimum and maximum mean scores that can be obtained for the subscales of the GCI-r are: 1–5.

(RMSEA), the Comparative Fit Index (CFI), and the Tucker–Lewis Index (TLI). The following fit index cut-off values are indicative of good model fit: CFI and TLI >0.90 and RMSEA <0.05 (Kline, 2005).

Concurrent validity was assessed by calculating correlations between the scales of the EssenCES and the GCI-r. For the correlation analyses, Pearson’s correlations of .10–.30 were seen as weak, .30–.50 moderate and >.50 were seen as strong (Cohen, 1988). SPSS version 20 (IBM, SPSS Statistics) and Mplus v.7 (Muthén & Muthén, 1998-2011) were used for statistical analyses.

## Auxiliary analyses

Because the sample included patients from different facilities, a one-way multivariate analysis of variance (MANOVA) was performed using facility (RFPC and LFPC) as independent variable, and scores on the subscales of the EssenCES and the GCI-r as dependent variables. This was done to check for potential differences between facilities in the distribution of the scores. A power analyses for MANOVA anticipating on a medium effect size ( $f^2$ ) of .25, a desired statistical power of .95 at a probability level of .05 (based on Dickens, Suesse, Snyman, & Picchioni, 2014) suggested that a minimum sample size of 66 was required.

## Results

### Auxiliary analysis

In order to see whether data from the patients living in the RFPC and LFPC could be combined for further analysis a MANOVA was conducted. There were no significant differences between the RFPC and the LFPC facilities on the subscales of the EssenCES and the GCI-r (Pillais’ Trace =.08,  $F(7,95) = 1.19$ ,  $p = .316$ ).

**Table 3.** Item loadings for the EssenCES following confirmatory factor analysis.

Item	PC	ES	TH
The patients care for each other	.84*		
Even the weakest patient finds support from his fellow patients	.80*		
Most patients don't care about their fellow patients' problems	.17		
When a patient has a genuine concern, he finds support from his fellow patients	.77*		
There is good peer support among patients	.74*		
Really threatening situations can occur here		.64*	
There are some really aggressive patients on this ward		.58*	
Some patients are afraid of other patients		.67*	
At times, members of staff are afraid of some of the patients		.77*	
Some patients are so excitable that one deals very cautiously with them		.52*	
On this ward, patients can openly talk to staff about all their problems			.78*
Staff take a personal interest in the progress of patients			.73*
Staff members take a lot of time to deal with patients			.66*
Often, staff seem not to care if patients succeed or fail in treatment			.62*
Staff know patients and their personal histories very well			.63*

Note. PC = Patient Cohesion, ES = Experienced Safety, TH = Therapeutic Hold.

\* $p < .001$ .

**Table 4.** Pearson correlations between the subscales of the EssenCES and the GCI-r.

	PC	ES	TH	Support	Growth	Repression	Atmosphere
PC	1	.36*	.43*	.37*	.36*	-.39*	.60*
ES		1	.41*	.49*	.28*	-.46*	.71*
TH			1	.83*	.63*	-.72*	.58*
Support				1	.70*	-.71*	.66*
Growth					1	-.63*	.56*
Repression						1	-.66*
Atmosphere							1

Note. PC = Patient Cohesion, ES = Experienced Safety, TH = Therapeutic Hold.

\* $p < .001$ .

### Internal consistency

Cronbach's alpha reliability coefficients of the original scales were good for all factors in both instruments (see Table 2). Within the total sample, Cronbach's alpha of the EssenCES ranged from .78 to .81, Cronbach's alpha of the GCI-r ranged from .74 to .95. According to Helmstade (1964) removal of an item would be wise in case of a CITC below .20, for the EssenCES this was the case for one item of the Patient Cohesion scale (*Most patients don't care about their fellow patients' problems*). For the other items of the EssenCES the CITC ranged from .47 to .71. One item of the Repression scale of the GCI-r (*You have to ask permission for everything here*) had a CITC < .20. For the other items of the GCI-r the CITC ranged from .34 to .81.

### Confirmatory factor analysis

The model results indicated satisfactory fit for the EssenCES three-factor model: CFI = .93, TLI = .92, and RMSEA = .05. All items loaded significantly on their target factors (see Table 3), with the exception of item 8 (*Most patients don't care about their fellow patients' problems*). A revised model leaving item 8

out showed an improved fit: CFI = .95, TLI = .94, and RMSEA = .05.

Regarding the GCI-r, model results indicated relatively poor fit: CFI = .82, TLI = .81, and RMSEA = .08. All items loaded significantly on their target factors, with the exception of item 3 (*You have to ask permission for everything here*). A revised model leaving item 3 out did not improve the model fit: CFI = .82, TLI = .81, and RMSEA = .08.

### Concurrent validity

Correlational analyses showed significant relationships between all subscales of the EssenCES and the GCI-r (see Table 4). There was a significant positive relationship between the Therapeutic Hold scale of the EssenCES and the Support scale of the GCI-r. The therapeutic Hold scale of the EssenCES correlated negatively with the Repression scale of the GCI-r. There was a significant positive relationship between the Experienced Safety scale of the EssenCES and Atmosphere scale of the GCI-r.

The highest correlation for the Patient Cohesion scale of the EssenCES was with the Atmosphere scale of the GCI-r. The highest correlation for the Growth scale of the GCI-r was with the Therapeutic Hold scale of the EssenCES. The relationship between the subscales within one instrument ranged for the EssenCES from  $r = .36$  to  $r = .43$ . The correlations between the subscales of the GCI-r measuring the positive aspects of ward climate (Support, Atmosphere, Growth) ranged from  $r = .56$  to  $r = .70$ . The Repression scale of the GCI-r (measuring a negative aspect of ward climate) correlated negatively with the positive GCI-r subscales, the range was between  $r = -.63$  to  $r = -.71$ .

## Discussion

This study examined the psychometric properties of the EssenCES and the GCI-r, and the overlap between these instruments, in a high secure forensic psychiatric setting. The results indicate good internal consistency of the subscales of the EssenCES and the GCI-r. For the EssenCES, the factor structure was confirmed within this sample. However, further research is needed into the structural psychometric properties of the GCI-r, as the original factor structure was not replicated within this sample. The results of this study empirically confirm the existence of both overlap and differences between the EssenCES and the GCI-r, and provide further specification of the nature of both the commonalities and the discrepancies.

For the EssenCES, almost all items of the EssenCES reached high factor loadings on their expected dimension. The exception was item 8 (*Most patients don't care about their fellow patients' problems*), similar to what was reported in previous studies (Howells et al., 2009; Schalast & Laan, 2017). Milsom et al. (2014) reported that they revised and reworded this item in their study and found that item 8 was strongly inter-correlated with the other items within the Patient Cohesion scale. The proposed factor structure of the GCI-r was not confirmed by factor analysis.

Bivariate correlation analyses showed that the GCI-r and the EssenCES were strongly related. As expected, a strong positive relationship was found between the Support scale of the GCI-r and the EssenCES' Therapeutic Hold scale. Also, a strong positive relationship between the Atmosphere scale of the GCI-r and the Experienced Safety and Patient Cohesion scales of the EssenCES was found. However, it should be noted that strong correlations were found between the Atmosphere scale of the GCI-r and all the other scales (both of the EssenCES and GCI-r). When looking at the factor loadings of the items on the Atmosphere scale of the GCI-r, item 1 (*The atmosphere is fine here*) and item 4 (*I feel fine here*) have the highest loading coefficients, it could be argued that these two items might reflect a general result of ward climate as a whole.

In line with our expectations, the Repression scale of the GCI-r showed strong negative relationships with all other scales (both of the EssenCES and GCI-r). The highest correlation was with the Therapeutic Hold scale of the EssenCES and the lowest with the Patient Cohesion scale of the EssenCES. This finding supports the notion that the Repression scale measures a concept reflecting negative transactional processes (structure, power, coercion) between staff

members and patients in closed setting (de Valk, Kuiper, van der Helm, Maas, & Stams, 2016). However, the items that make up the Repression scale of the GCI-r seem to be less homogeneous than the other scales (e.g., *"You have to ask permission for everything"*, *"I sometimes get really bored here"*, *"Sometimes the surroundings are dirty"*, *"The surroundings make me depressed"*). Heynen, van der Helm, Cima, Stams, and Korebrits (2016) argued that the PGCI (from which the GCI-r is derived) needs further development, and they proposed to conceptually separate deprivation (unsatisfactory living conditions, such as a lack of privacy and boredom) and repression. De Valk et al., (2016) pointed out that repression is an important factor to take into account because of the risk closed settings bear (involuntary stay, unequal power distribution between staff and patients), and the supposed threat of repression to the rehabilitative goal. Feelings of powerlessness and repression are part of the subjective experience of receiving forensic mental health services (Livingston & Rossiter, 2011). Subsequently, it seems important to further investigate this concept, its definition, operationalization, contribution to ward climate, and effect on treatment efficacy.

Our expectation that the Growth scale of the GCI-r would show relatively low correlations with the subscales of the EssenCES was not supported. The Growth scale of the GCI-r was strongly related to the Therapeutic Hold scale of the EssenCES. It is plausible that focusing on facilitation of learning and preparation for a meaningful life both within and outside the closed facility is an important element of therapeutic holding.

Compared to the moderate relationships found among the three subscales of the EssenCES, relatively high correlations were found between all four subscales of the GCI-r. More research is needed to further explore whether the subscales of the GCI-r measure different aspects of ward climate. The relatively high correlations between the subscales of the GCI-r could be a potential explanation why the proposed factor structure of the questionnaire was not found within this study.

One issue that became evident from our study is that more attention needs to be paid to the characteristics of the instruments. Specifically, the items of the EssenCES and GCI-r differ in the perspective from which they are formulated. For instance, 72% of the items making up these scales of the GCI-r are formulated from a first-person perspective (21 of the 29 items), e.g.: *"I learn the right things here"*, or *"I trust*

the group workers". The items of the EssenCES are formulated from a more general perspective, inviting respondents to take the experience of other group members into account: "Even the weakest patient finds support from his fellow patients", or "At times, staff members are afraid of some of the patients". It remains unclear how exactly these differences in perspective have an impact on how the questionnaires are filled out. In the future, the effects of the perspective required for answering the items needs to be examined carefully to determine which approach is more suitable for measuring ward climate. Another caveat is that construct validity could not be fully tested, as there was no measure included that could be used to address discriminant validity. Also, although we used a robust non-parametric estimation procedure within the CFA, replication with larger sample is recommended, especially to test the original four factor structure of the GCI-r. Finally, it could be the case that individuals that did not participate in the assessment have other views on ward climate than individuals that did participate. As the response rate per unit was relatively low it was not possible to generate "mean" climate scores for the units in order to explore variation in the evaluation of ward climate on a group level. In future research it would be interesting to compare instruments on their ability to detect variation in climate between units.

Our findings illustrate the importance of considering how instruments may differ in the definition and operationalization of ward climate. Hence, instruments used in clinical practice seem to differ in the aspects of ward climate they aim to measure and the amount of empirical support that they do so in a valid way (see also Tonkin, 2015 for a review). Nursing staff and management within the high-secure forensic setting could use the knowledge derived from this and other studies in their choices related to monitoring ward climate. Our results are most favorable for the EssenCES as an instrument to monitor aspects of ward climate in samples similar to the one used in the current study. The EssenCES will invite individuals to evaluate topics like safety, support, and cohesion on a group level (while taking other group members into account in their evaluation). Furthermore, the EssenCES can be used to measure how ward climate is perceived by both staff members and patients. Taking the perception of both staff and patients into account when monitoring ward climate is important, as their general perception of ward climate may differ (de Vries et al., 2016; Tonkin, 2015).

The GCI-r requires patients to reflect on their own personal experiences on the ward and will provide management and forensic nurses insights concerning whether patients personally feel supported, are given possibilities for growth and whether they experience negative aspects of ward climate. Until now, most validation studies were conducted in youth prisons using the PGCI (Heynen et al., 2014; van der Helm et al., 2011), and our study is among the first to investigate this instrument's psychometric properties in adult forensic patients. Importantly, the findings highlight that researchers and practitioners should be cautious when using the subscales of the GCI-r in similar populations as used within the present study, as the factor structure was not confirmed. Note that this does not imply that the use of the GCI-r should be avoided in forensic samples. For instance, there are indications that the GCI-r might be suitable to assess the perception of ward climate for clients with mild intellectual disability or borderline intellectual functioning in secure psychiatric forensic care, as the factor structure of the GCI-r has been supported there (Neimeijer et al., 2018). Taken together, this pattern of results pinpoints that the suitability of these self-report measures differs depending on the characteristics of the (sub-)populations being targeted.

A critical note is that although both the EssenCES and the GCI-r are relatively easy to use in clinical practice, both instruments draw a simplified picture of ward climate. There are studies advocating a more in-depth definition and operationalization of ward climate (Boone et al., 2016; Doyle et al., 2017). Alongside routine monitoring using short self-report measures, it has been recommended that more detailed information should be gathered by using more lengthy questionnaires (Tonkin, 2015), by means of focus groups, or through individual interviews with patients and staff (Boone et al., 2016; Doyle et al., 2017).

To conclude, the EssenCES and the GCI-r are instruments to measure partially overlapping aspects of ward climate. However, as the instruments differ in several ways further development and validation is needed. There are some important considerations that require attention, such as finding an appropriate definition of ward climate, determining which elements are important within adult forensic psychiatric setting, and determining which respondent types we are interested in. Ultimately, addressing these issues will help determine which instrument is best suited to measure this complex construct in clinical practice.

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## ORCID

Inti Angelo Brazil  <http://orcid.org/0000-0001-5824-0902>

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