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The Physical and Psychosocial Environment's Influence on Patients' and Staff's Perceptions of Person-Centered Care in Forensic Psychiatry

Eirini Alexiou RN[1,2], Alessio Degl' Innocenti[2,3], Anette Kullgren RN[4], Hanna Falk RN[4,5] and Helle Wijk[4,6,7]*

[1]Department of Forensic Psychiatry, National Board of Forensic Medicine, Sweden

[2]Center for Ethics, Law, and Mental Health (CELAM), University of Gothenburg, Sweden

[3]Forensic Psychiatric Clinic, Sahlgrenska University Hospital, Sweden

[4]Institute of Health and Care Science, University of Gothenburg, Sweden

[5]Department of Psychiatry and Neurochemistry, University of Gothenburg, Sweden

[6]Department Quality Assurance, Sahlgrenska University Hospital, Sweden

[7]University of Gothenburg Centre for Person-Centred Care (GPCC), University of Gothenburg, Sweden

***Corresponding author:** Helle Wijk, Institute of Health and Care Sciences, The Sahlgrenska Academy at Gothenburg University, Box 457, 405 30 Gothenburg, Sweden

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Abstract

Objective: We sought to investigate the impact of the psychosocial and physical environment on patients' and staff's perceptions of the care atmosphere, quality of care and possibility to perform person-centered care at three forensic psychiatric facilities in the county of Västra Götaland in Sweden.

Background: In order for a forensic psychiatric care environment to be adaptable to face the needs of the patients, a person-centered approach is needed. Person-centered care regards the patient as a person with unique experiences, desires and preferences that must be taken into account when care is provided. This requires a sufficiently flexible staff to accommodate these individual conditions and an environment adapted for individual needs.

Methods: Participants were patients over 18 years of age sentenced to compulsory forensic psychiatric treatment, and health care professionals at the wards of the aforementioned facilities. Data were obtained by employing structured questionnaires.

Results: Overall, 58 patients (72% were men) with an age range of 18 to 69 years, and 239 staff members (43% were men) with a mean age of 45 years, participated in the study. Although the staff estimated their possibility to provide person-centered care as rather high this didn´t correspond with the patients' assessment of perceived ward atmosphere as person-centered. There was a difference in assessed person-centered ward atmosphere between urban and rural facilities in favor of the urban hospital ($p<0.01$).

Conclusion: The results of this study indicate that patients' and staff's perceptions of person-centered care in forensic clinics are highly susceptible to factors in the physical and psychosocial environment.

Keywords: Person-centered care; Environment; Ward atmosphere; Forensic psychiatry; Rural; Urban

Introduction

It is well known that the physical environment has a huge influence on patient rehabilitation by providing support for declining functional capabilities and strengthening preserved resources. An environment that maximizes safety and security as well as awareness and orientation, supports functional abilities, facilitates social contact, provides privacy, gives opportunities for personal control, regulates stimulation and provides the possibility for continuity is supposed to characterize a secure and safe caring environment [1]. The main purpose of a forensic psychiatric facility is to act as a place for improving health and promoting recovery for the patients with the aim to them re-entering society. It can be presumed that the physical environment has an impact on patients' rehabilitation in forensic psychiatric care, just as it has in other medical disciplines such as general psychiatry, geriatrics and oncology [2]. Nevertheless, most facilities in forensic psychiatric care are designed and constructed with a traditional institutional layout with single-bed rooms located alongside long double-loaded corridors with the priority placed on their effectiveness as workplaces for staff rather than on habitability for patients [3]. Patients in forensic psychiatry care are unique persons who have been referred by the courts for assessment or who have been declared as being not criminally responsible or unfit to stand trial by the criminal justice system. The majority of these individuals are in need of secure in-patient care and assistance over long periods of time, which poses great demands on the healthcare environment.

Any healthcare environment consists of physical, psychosocial and cultural dimensions, which individually and collectively contribute or withhold patients' well-being by capitalizing or preventing particular strengths while reducing or increasing limitations [4]. In recent years, a stronger research focus has been placed on considering the relationship between the physical healthcare environment, patient well-being and staff work-satisfaction [5], emphasizing how poorly designed environments are a risk, inhibiting functioning and social well-being [6]. In 1973, Lawton and Nahemow developed an ecological model of environmental fit that has provided a theoretical background for understanding the need for environmental adaptions

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in order to match individual abilities. This model suggests that an individual's behavior and well-being is a result of the interaction between the complexity of personal abilities and their adaptation to the environment. Optimal fit occurs when someone's capacities are consistent with the demands and opportunities within that person's environment. However, if the demands of the environment exceed or undercut the person's abilities, there is a person-environmental incongruity. This concept is well in line with the ratings included in the generic quality-assessment protocol that measures good caring environments and their ability to accomplish safety and security, by focusing on orientation, functional abilities and personal control [1].

Patients in forensic psychiatric care who have sufficient and adequate resources at their disposal, and who learn how to use them, can gradually develop a strong sense of coherence. Resources that are bound to individual capacity can be summoned within people, but these can also be found in their immediate physical and psychosocial environment which is of great importance in a forensic psychiatric health care environment that aims to be supportive, habitable and safe [7]. Within the context of forensic psychiatry, person-centered care emphasizes the individual's right to define what steps need to be taken in order to achieve health and well-being in the process towards rehabilitation and re-integration into society. Person-centered care environments are known to acknowledge the respective resources, needs, personality, preferences, habits, and cognitive, sensory, and physical limitations of each patient [8].

There is little evidence on the effects of person-centered environments in forensic psychiatry found in the literature, although there have been several approaches presented of how to change the environment in forensic psychiatry to meet the needs of the patients. A growing body of research suggests that the environment should not only support patients' functional abilities and physical activity but should also provide them with a sense of control and independence [9]. Disruptive behaviors are prevalent in most forensic psychiatric long-term care facilities. For example, about 70% of residents suffer from insomnia or disturbed sleep [10]. Furthermore, environmental factors that may contribute to sleep disturbance include limited sunlight exposure, large amounts of time spent in bed, lack of physical activity, and nighttime noise [11].

Finally, the characteristics of a traditional environmental design in forensic psychiatric care may contribute to confusion and disorientation, such as monotony of architectural composition and lack of reference points [12], long corridors with many doors and lack of windows or lack of access to windows. One study, for example, has shown that different aspects of the environment in forensic psychiatry - such as the unit layout, supportive features and finishes, reduced noise, as well as access to outdoor spaces and sensory stimulation - may be linked to better outcomes, including improved sleep, better orientation, reduced aggression and disruptive behavior, increased social interaction, and increased overall satisfaction and well-being [13].

In view of the above disparity, we sought to investigate the impact of the psychosocial and physical environment, and subsequent architectural interventions, on forensic psychiatric care outcomes. There is a specific need to demonstrate that person-centered forensic psychiatric environments have an impact on the quality of care in light of the high costs that the authorities have invested in health care facilities recently. Additionally, we aimed to study the effect of the working environment and other staff-related parameters, such as competence and experience, on the delivery of person-centered care. In this first scientific report, the specific aim is to present baseline data of the three forensic psychiatric facilities in the county of Västra Götaland, Sweden; one urban and two rural. In order to confirm or reject our preconceptions–that a poorly designed environment has a negative influence on patients' and staff's perceptions- we provide a systematic description of (1) ward atmosphere, (2) quality of care, and (3) staff possibility to perform person-centered care before relocation.

Methods

This study was conducted at the three forensic psychiatric clinics in the western part of Sweden in the county of Västra Götaland; one urban, and two rural facilities. The environment matched on all design features at the three forensic psychiatric clinics. The design faced both latent implicit and explicit architectural drawbacks according to architectural evaluation documented in a local report [14] and existing evidence based literature in this field [4]. These included that standardized traditional single-patient rooms, called 'back-to-back', were laid out on both sides of a hallway; a lack of individual bathrooms; a deficient ventilation system; lack of windows and controllable lighting and temperature; lack of access to the natural environment and daylight exposure, neither through a nature window view or by gaining access to gardens with seating areas; poor placement of handrails; and inappropriate door openings and furniture heights.

Data collection, measures, and outcomes

All patients and staff at the three clinics were informed about the study and asked if they were willing to participate. The staff was informed by the researchers, both orally at a general meeting and by written information. After given informed consent they were asked to fill in the questionnaires. The same procedures were followed for the patients, with the exception that they were informed at their specific unit. Data were collected prospectively between 2010 and 2011 and before the intervention of relocating the forensic psychiatric clinics to the new health care buildings.

For patients, demographic data included age, gender, place of birth, education, employment history, marital status, place of residence before admission to the forensic psychiatric clinics, previous admission to a psychiatric ward, length of current admission, and compulsory care during current admission. For members of staff, demographic data included age, gender, education, current profession, and professional experience within the field of forensic psychiatry.

In the patient group, perceived ward atmosphere was measured using the patient version of the *Person-Centered Climate Questionnaire* (PCQ-P) which is a patient-reported outcomes instrument designed for evaluating the extent to which a climate (i.e., the physical and psychosocial environment) is perceived as being person-centered (i.e., supporting the person by placing his or her needs and expectations at the center of care). The instrument comprises 3 related domains; safety (10 items), everydayness (4 items), and hospitality (3 items). The domain of safety is related to experiences of being safe in

Table 1: Reliability and internal consistency for the instruments measured by Cronbach's alpha.

Person-centered Climate Questionnaire (patient version: PCQ-P)	0.95
Safety (domain 1)	0.95
Everydayness (domain 2)	0.74
Hospitality (domain 3)	0.63
Person-centered Climate Questionnaire (staff version: PCQ-S)	0.89
Safety (domain 1)	0.84
Everydayness (domain 2)	0.78
Community (domain 3)	0.80
Person-centered Care Assessment Tool (P-CAT)	0.70
Quality in Psychiatric Care instrument	0.96
Treatment (domain 1)	0.94
Participation (domain 2)	0.90
Discharge (domain 3)	0.75
Assistance (domain 4)	0.75
Secluded Environment (domain 5)	0.73
Safely Environment (domain 6)	0.79
Specific Questions for Forensic Department (domain 7)	0.78

the environment; the domain of everydayness is related to the environment as having an everyday tidy character; and, finally, the domain of hospitality is related to the feeling of welcoming and the sense of perceiving the care and treatment as exceeding expectations. The items are rated on a 6-grade Likert scale, ranging from "I disagree completely" to "I agree completely." The questionnaire is sum scored, and scores can range between 17 and 102, with higher scores indicating a more person-centered climate [15,16]. Quality of care was measured using the *Quality in Psychiatric Care questionnaire* (QPC), which is a patient-reported outcomes instrument designed to measure the quality of care from a patient perspective [17]. The instrument contains seven related domains; encounter (8 items), participation (8 items), discharge (3 items), support (4 items), secluded environment (2 items), secure environment (3 items) and specific questions about the forensic clinic (6 items). The last 6 items have been developed for use in forensic psychiatric settings with an emphasis on legal matters surrounding such settings [17]. It included questions about whether the patients have been informed about their rights, or have received help to contact the Administrative Court and their lawyers, as well as questions about the involvement of staff and doctors in treatment and crime processing. The items are rated on a 4-grade Likert scale, ranging from "I agree completely" to "I disagree completely". The overall score is calculated as the mean of the individual item scores which can vary between 1 and 4. Higher scores indicate lower quality of care from a patient perspective.

In the staff group, perceived ward atmosphere was also measured using the staff version of the *Person-Centered Climate Questionnaire* (PCQ-S). The instrument comprises 3 related domains; safety (6 items), everydayness (4 items), and community (4 items). The domains of safety and everydayness have previously been described. The domain of community involves possibilities to keep previous social contacts and to establish a new social context in the environment. The items are rated on a 6-grade Likert-scale, ranging from "I disagree completely" to "I agree completely." The questionnaire is sum scored, and scores can range between 14 and 84, with higher scores indicating a more person-centered climate [15,16]. Person-centered care was measured using the *Person-centered Care Assessment Tool* (P-CAT) which is a self-reported outcomes instrument designed for evaluating the extent to which staff perceived they have a possibility to provide person-centered care and to which degree environmental factors support them in their work [18]. The instrument consists of 13 items that are rated on a 5-grade Likert scale, ranging from "I disagree completely" to "I agree completely." The questionnaire is sum scored, and scores range between 13 and 65, with higher scores indicating more person-centered care [15,16]. Reliability and internal consistency was good for the majority of the instruments and acceptable for the dimension of hospitality in the PCQ-P. The instruments, along with their respective dimensions and Cronbach's alpha values, are presented in Table 1.

Statistics

Although data were collected at two different rural facilities, no statistically significant differences were found between them. Therefore, data from these two clinics were merged and reported as one single rural facility. Descriptive statistics were calculated for all variables. Differences between the rural and urban facility were tested using independent samples *t*-test and χ^2- test.

First, we analyzed incomplete data using the expectations-maximization (EM) algorithm. Most of the items were phrased so that strong agreement indicates a positive quality. However, five of the items on the P-CAT instrument and all of the items on the QPC instrument were phrased in reverse, in order to make those items comparable to the other items. In that way, higher overall score indicated better quality of care from a patient perspective. Age and gender were used as covariates in all comparisons between rural and urban clinics. Comparisons of the patients' over all scale scores between genders, as well as between urban and rural clinics, were performed by the calculation of Student's *t*-test. We compared the scores between members of the staff working in the urban and in the rural hospitals, respectively, and between genders, by using the *t*-test. The effect of the patients' educational level on scores was also analyzed by using one-way Analysis of Variance (ANOVA). Finally, we performed a pair wise comparison of the scale scores, among patient groups with different educational levels, by using Fisher's Least Significant Difference test. All reported *p*-values are based on two-sided tests and compared to a significance level of 5%. In order to measure the strength of the linear relationship between the variables, we calculated the Pearson correlation coefficient. Finally, the relationship between length of stay and patient awareness of who their treating physician was and their diagnosis was examined by using the Pearson's χ^2 test (chi-square). The SPSS statistical software package (version 20 SPSS, Chicago, IL) was used for all statistical calculations.

Ethics

This study was approved by the research ethics committee at the University of Gothenburg, Gothenburg, Sweden (Dnr 671-10).

Results

Out of a total of 74 patients who gave informed consent

Table 2: Person-centered care and care atmosphere measured by P-CAT* and PCQ-S**.

	Mean (SD)	Min-Max
P-CAT*		
PCQ-S**	4.00 (.77)	1.57-5.86
Safety (domain 1)	4.35 (.89)	1.50-6.00
Everydayness (domain 2)	3.17 (.97)	1.00-6.00
Community (domain 3)	4.32 (.93)	1.50-6.00

*P-CAT = Person-centered Care Assessment Tool; Range 1-5.
**PCQ-S = Patient-centered Care Questionnaire (staff version); Range 1-6.

Table 3: Person-centered care and care atmosphere measured by PCQ-P*.

	Mean (SD)	Min-Max
PCQ-P*	4.42 (1.13)	1.44-6.00
Safety(domain 1)	4.59 (1.22)	1.30-6.00
Everydayness(domain 2)	3.79 (1.25)	1.00-6.00
Hospitality(domain 3)	4.64 (1.12)	2.00-6.00
Quality in Psychiatric Care instrument	2.59 (0.82)	1.00-4.00
Encounter(domain 1)	2.53 (1.00)	1.00-4.00
Participation(domain 2)	2.58 (0.91)	1.00-4.00
Discharge(domain 3)	2.48 (1.06)	1.00-4.00
Support(domain 4)	2.51 (1.04)	1.00-4.00
Secluded Environment(domain 5)	2.48 (1.19)	1.00-4.00
Secure Environment(domain 6)	2.54 (0.91)	1.00-4.00
S.Q.f.F.D.** (domain 7)	2.67 (0.93)	1.00-4.00

*PCQ-P = Patient-centered Care Questionnaire (patient version); Range 1-6.
**S.Q.f.F.D.= Specific Questions For Forensic Department; Range 1-4.

to participate in the study, 58 patients (78.4%) answered the questionnaires (n=30 rural facility, n= 28 urban facility). Forty-two were men (72.4%) and the age range varied from 18 to 69 years of age. The age group 18-29 represented 35.1% of all patients, while the proportion of patients over 60 years was only 1.8%. The vast majority of the patients reported a previous experience in psychiatric care and was at the time of the study under compulsory forensic psychiatric care (70.7% and 89.6%, respectively). Furthermore, 239 out of a total of 254 staff members from the three hospitals (n=94 rural facility, n=145 urban facility) also participated in the study. One hundred and three were men (43.1%) and the mean age of the staff members was 45 years of age (range 23-65 years, SD=10.83).

Scale scores for staff are presented in Table 2. It is noteworthy that the staff assessed their possibility to provide person-centered (P-CAT) care rather high, which is in line with their assessment of the care atmosphere (PCQ-S). Of the three domains, everydayness was evaluated the lowest. Scale scores for patients are presented in Table 3. The PCQ-P shows the same picture for the rating of everydayness in the care atmosphere as for the staff; i.e., this domain is evaluated as the lowest. The table also reveals that the patients perceived the care atmosphere to be high with hospitality as the most dominant domain. Table 4 shows a weak positive correlation between everydayness and age of staff (r=0.19, $p \leq 0.05$), between everydayness and number of years in the profession (r=0.18, $p \leq 0.05$), and between everydayness and length of experience in forensic psychiatry (r=0.16, p≤0.05). These results indicate a weak trend that increasing age of staff, longer

Table 4: The correlation between staff characteristics such as age, number of years in the profession and number of years in forensic psychiatry and the scale scores, using the Pearson's r coefficient.

	P-CAT[1]	Safety[2]	Everydayness[3]	Community[4]
Age of staff	0.03	0.03	0.19*	0.02
Number of years in the profession	-0.00	0.09	0.18*	0.04
Number of years in forensic psychiatry	0.07	0.10	0.16*	0.10

*$p \leq 0.05$
[1]Person-centered Care Assessment Tool
[2]Domain 1
[3]Domain 2
[4]Domain 3

Table 5: The correlation between patients' age and scale scores using the Pearson's r coefficient.

PCQ-P[1]	0.42*
Safety[2]	0.42*
Everydayness[3]	0.33*
Hospitality[4]	0.33*

*$p \leq 0.05$
[1]PCQ-P = Patient-centered Care Questionnaire (patient version); Range 1-6
[2]Domain 1
[3]Domain 2
[4]Domain 3

professional experience and longer professional experience in forensic psychiatry may increase the value of everydayness among the staff members. In Table 5, the patient's age was significantly correlated with perception of safety (r=0.42, $p \leq 0.05$), everydayness (r=0.33, $p \leq 0.05$), hospitality (r=0.33, $p \leq 0.05$) and PCQ (r=0.42, $p \leq 0.05$) scores. No other significant correlations were demonstrated ($p > 0.05$). The above results show that there is medium-intense positive effect; older patients had significantly higher scores in the aforementioned domains, indicating that the older the patients are the higher they perceive an atmosphere of everydayness, hospitality and safety in the care setting. Patients treated in the urban hospital had higher mean scores compared to patients treated in the two rural hospitals in the following: QCP (mean 2.87 *vs.* 2.08, $p<0.01$, followed by its dimensions: encounter (mean 2.96 *vs.* 2.14, $p<0.01$), discharge (mean 2.62 *vs.* 1.72, $p<0.01$), support (mean 2.54 *vs.* 1.81, $p<0.01$), secluded environment (mean 3.31 *vs.* 1.58, $p<0.01$), and Specific Questions for Forensic Department (mean 2.88 *vs.* 2.11, $p<0.01$). The above

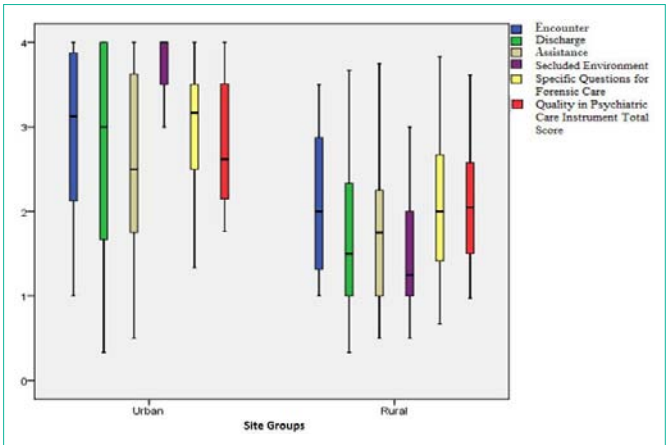

Figure 1: The comparison of the Quality in Psychiatric Care instrument and its dimensions between Site Groups.

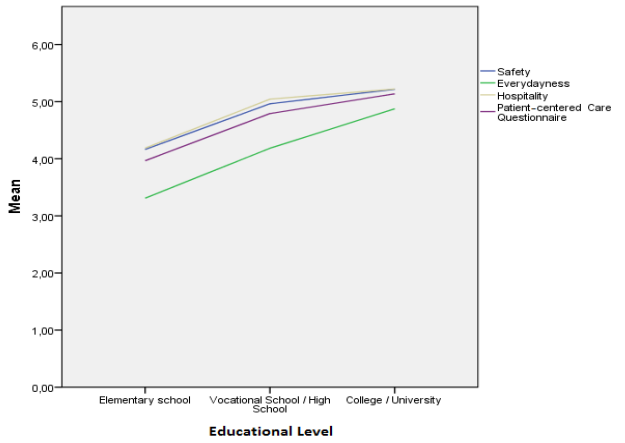

Figure 2: The effect of the patients' level of education on the Patient-centered Care Questionnaire (patient version) and its domains (i.e. everydayness, safety and hospitality) using Fisher's LSD test.

results are graphically presented in Figure 1. The level of education had a significant effect ($p<0.05$) on the patients' assessment of an atmosphere of patient-centeredness (PCQ-P) and in the domains of everydayness, safety and hospitality, respectively ($p<0.05$). Fisher's LSD-test showed that the domain of everydayness score appears to be significantly lower among the patients with an elementary school education (n=29) compared to patients with a higher education level (n=29). The above results are presented in Figure 2.

Discussion

This study investigates the influence of the psychosocial and physical environment on patients' and staff's perceptions of the care atmosphere, quality of care and possibility to perform person-centered care at the three forensic psychiatric facilities in the county of Västra Götaland in Sweden. The main findings of this study show that the specific instruments used to assess perception of ward atmosphere in terms of safety, everydayness, and community, as well as the staff's possibility to provide person-centered care, indicated obvious room for improvement. This finding is particularly true for the perception of everydayness, i.e., an atmosphere of "feeling at home", for both staff and patients. It may be inferred that these findings can be attributed to several shortcomings of the physical and psychosocial environment extant in the participating facilities. For instance, all three facilities lacked private bathrooms, had insufficient ventilation systems and disturbing levels of noise and vibration between rooms, lacked appropriate windows, controllable lighting and temperature, offered poor access to the outdoors and daylight exposure, inappropriate placement of handrails and door openings, as well as unsatisfactory furniture height. The above assumption is in accordance with existing evidence and the common belief among professionals that the quality of the physical and psychosocial environment in healthcare facilities influences the perceptions of patients and staff, which, in some cases, also has an impact on clinical outcomes [19].

Another important finding is that the age of the staff and their years of working experience in forensic psychiatry significantly affected their ability to create an atmosphere of everydayness for the patients in the care setting. It appeared to be easier for senior staff members with longer professional experience in forensic psychiatric care to create an atmosphere of "feeling at home". Compared to junior staff members, senior staff members also seemed to be better equipped to create an atmosphere of security and to provide a higher quality of patient care. Previous studies offer tantalizing insights into a number of staff-related characteristics, including years of experience and its associations with the level of quality of care and patient security [20]. Security comprises two dimensions: a feeling of being in safe hands with the healthcare provider; and outcomes, such as numbers of healthcare-related injuries, as well as potentially preventable complications in at-risk patients. Safe practices that avoid errors and anticipate complications of care and practices that provide a sense of everydayness can be thought of as either a basic element of or a precondition for delivering high-quality care, but are generally thought of as only one component of quality [21]. These findings are in accordance with the fact that older health care professionals, who have acquired important skills through life experiences, do not only provide important clinical expertise [22] that is most needed, but also possess other important attributes. Having a connection or being familiar with patients and disease processes, as well as having preparedness, calmness, dependability, knowledge, confidence, and a strong work ethic allow older healthcare professionals to maintain a greater sense of security [23].

The relevant analysis among the different types of educational preparation did not, however, produce any statistically significant results. The composition of the staff employed in the wards of the forensic psychiatric clinics, in terms of unlicensed personnel and registered nurses, was calculated. Although health services researchers have, for several decades, reported associations between nurse staffing and the outcomes of hospital care, there has essentially been limited evidence of its impact on long-term care outcomes. While a recent study that has offered persuading insights regarding the association between higher proportions of staff holding higher degrees of education with lower negative patient outcomes [20], these findings are still considered too early to be borne out. Similarly, while many have a subjective feeling that a higher percentage of staff holding bachelor's degrees, specialty training and professional certification have logical associations with quality of care and patient safety, empirical data regarding their impact are very limited at present [21].

The patients' assessment of quality of care also indicated room for improvement. Specifically, patients treated in the urban hospital experienced a higher quality of care compared to patients treated in the two smaller rural-based clinics. Several possible explanations exist for this finding: first, these smaller rural-based clinics often have fewer resources and less funding than larger urban clinics [24]; but also, the fact that only a lower percentage of skilled personnel serve the rural populations [25] may be an issue. This finding matches previous study that also demonstrated that healthcare quality in rural settings might be inferior to that found in urban settings. Most previous studies are limited because they either focused on a single disease state or examined rural regions alone with no comparisons to urban or metropolitan populations [26]. In contrast, other studies have documented superior outcomes in rural settings for common procedures [27]. A possible explanation for these results could be that rural hospitals deal with fewer total patients in comparison to their urban counterparts, perhaps allowing the medical staff in rural hospitals a greater opportunity to evaluate and treat patients and

adhere to quality measures [24]. In addition, rural hospitals may transfer many of their patients to urban hospitals. In contrast to the above, and because there is a well-documented connection between volume and quality, rural hospitals treat too few patients to be as proficient as their urban counterparts [28].

Elderly patients described a higher atmosphere of everydayness and safety in the care setting. This finding is in accordance with the results of a recent study examining age-related differences in patient satisfaction and physician–patient interaction [29]. According to this study, the patient's age moderated the association between interaction style and patient satisfaction: elderly patients were more satisfied with patient-centered encounters and physicians were more likely to have patient-centered encounters with elderly patients.

Another finding of this study is that a patient's literacy level appears to be an important determinant of their perception of quality in care. In particular, patients with a higher education level described a higher atmosphere of everydayness in the care setting than patients with an elementary school education. Several possible explanations may exist for this phenomenon. One of these may be the importance of literacy level on patients' participation in the medical encounter. Low-literacy patients ask fewer questions about their medical care, and this may affect their ability to learn about their medical conditions and treatments [30]. Furthermore, based on data identified by the DeWalt review [31], reading ability is related to knowledge about health and healthcare, hospitalization, global measures of health, and some chronic diseases.

Finally, the length of care of the patients did not affect their knowledge of their diagnoses or treating physician. Prior studies have revealed important findings about the relationship between hospitalized patients and healthcare professionals [32], while one study has demonstrated patients' difficulty in identifying their physicians [33]. Additionally, at hospital discharge, patients are frequently unable to list their diagnoses [34]. A possible explanation for the above findings may be the large number of physicians caring for patients in long-term services due to frequent changes in practicing physicians, but it may also be due to the lack of a prior relationship and a more collaborative interaction. Francis et al. demonstrated an improvement in patients' ability to identify their physicians by improving patients' familiarity with them. Physicians should be aware that hospitalized patients frequently do not agree on symptom assessment or understand aspects of their plan of care. A shared decision-making model would improve hospitalized patients' understanding of the benefits of diagnostic and shared responsibility in a therapeutic alliance [32].

There are several potential limitations to our study. First, the number of participants included was limited, especially for the rural hospitals. This could be explained by reluctance among patients in forensic psychiatric care to participate in studies. Second, the majority of the patients were under compulsory forensic psychiatric treatment, which might have influenced their potential to rate more negatively on items due to a general mistrust of the legal and healthcare system. Third, a vast proportion of the patients were younger than 25 years of age which might be an implicit bias due to the generation effect and due to the immense internalized psychological and emotional conflicts that young patients undergo because they are diagnosed with a condition for which they do not consider themselves to be at risk off.

In conclusion, the findings show that both patients' and staff's perceptions of ward atmosphere in forensic psychiatric clinics are highly susceptible to factors in the physical and psychosocial environment. These findings could be predicted, but more surprisingly is the fact that despite the increasing amount of evidence-based knowledge in the area, there was still room for improvement. Adapted physical and psychosocial environmental conditions influence the patients' perceptions of the quality of care, as well as the staff's assessment of their possibility to provide person-centered care. Even though this study did not measure to what extent the physical and psychosocial environment facilitated the patients´ health, recovery and capacity to re-enter society, it could be assumed that a person-centred environment has an impact on these outcome factors. An insight from this research is that person-centred environments are not just physical structures, but also psychosocial ones. An implication for future construction facilities would be to involve both staff and patients to a greater extent than now in the design of the health care environment. Further investigation is warranted to confirm the findings in larger samples extracted from similar care environments. In our forthcoming studies we will report whether an intervention aiming to accomplish a person-centered care approach supported by architectural design, leadership and staff competence in forensic psychiatry could be measured as an increase of ward atmosphere, quality of care, and person-centered care as reported by the individual.

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