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Contributing Factors to Aggressive Incidents in Correctional and Forensic Psychiatric Care: A Rapid Evidence Assessment.

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Structured Abstract

Purpose: Aggression within secure settings poses considerable concern. This paper aims to offer more recent considerations of factors, such as cultural and environmental, that contribute to the prediction of aggressive security incidents, focusing on a rapid evidence assessment (REA) of available literature since 2018.

Design/methodology/approach: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher et al., 2009) guidelines were utilised for this REA, taking guidance from a previous study (Ireland et al, 2019) for the development of search terms.

Findings: Twenty-three final studies were included in the REA. All studies were conducted in either prison (n = 8), psychiatric in-patient facility with involuntary or compulsory treatment (n = 7), and forensic secure services (n = 7), with one study looking at both general in-patient psychiatric hospital and forensic services. Thematic analysis noted 4 main themes that were predictive of aggressive security incidents, these were: (1) Inadequate living facilities and poor physical environment, (2) Institutional security levels predicting aggression, (3) Restricted movement and the lack of meaningful activities, (4) Ward atmosphere and staff factors impacting staff-client relationships and consequent aggression.

Practical implications: This REA adds value to understanding the current interplay between the living facilities, wider forensic environment and interaction of staff in a forensic client's aggressive behaviours.

Originality/value: This REA offers an updated reflection and understanding on the presentation of aggression in secure forensic environments.

Key words: Violence, Aggression, Forensic Psychiatric, Correctional, Ward Atmosphere, Meaningful Activities

Introduction

Aggression within secure and correctional settings poses significant concern for client and staff safety[1]. In the UK the risk of staff in high secure settings being assaulted is significant, with studies showing over 5000 incidents occurring in a single year (Uppal & McMurran, 2009). Forensic clients are considered to pose a grave risk of harm to others (NHS, 2021), and as such, are a particularly high-risk group with respect to aggressive behaviour. Experiencing assault in secure services has significant physical and mental health consequences on staff, including physical injury, chronic pain (Gerberich et al., 2004; Levin, Hewitt, & Misner, 1998), as well as psychological distress (van Leeuwen & Harte, 2015) including anger, depression, sleep disturbances and burnout (Kelly et al., 2021). There is therefore an increased need for identifying and understanding risk factors contributing to forensic client aggression within these closed settings, in order to inform prevention strategies and management policies. Furthermore, definitions of aggression can be varied and under debate. A routinely argued definition would be that used in aggressive risk assessments, such as the HCR-20, and which forms the definition of aggression in this paper. Here they argue that aggression is the actual, attempted, or infliction of bodily harm on another person. This has to be deliberate and wilful, with the bodily harm also including serious psychological injury, with any threats being clear and unambiguous (Douglas, Hart, Webster & Belfrage, 2013).

There are several factors that contribute to a forensic client's aggression, both individual factors such as presence of psychotic disorders and substance abuse, as well as staff factors

[1] The literature will use various interchangeable terms for forensic settings, depending on the country of the research etc. Unless stated, and for the context of this paper, (secure) forensic settings or institution include those where a forensic client will reside, correctional refer to prison settings, and 'forensic psychiatric' refers to the residence of a forensic client with mental disorder.

including gender, job strain, burn-out and staff-patient interactions (Weltens et al., 2021). Blevins et al. (2010) have argued the heightened stress a prison or forensic setting can be problematic to a forensic client. This can include a range of strains for them, such as the denial of positively valued goods and stimuli, and the presentation of noxious provocations, including over-crowding, lack of privacy and heightened risk of victimisation through dormitory-style quarters. Public inquiries into security incidents in forensic psychiatric settings have further identified the role of culture and environment as important risk factors (e.g. Blom-Cooper et al., 1992; Fallon et al., 1999), and where culture equates to the beliefs, social forming and characteristic features of the setting. Earlier research has shown that institutional aggression decreases when the forensic client's environment is altered in order to provide higher levels of autonomy, improved living conditions, and more daily activities (Cooke, 1991). Increasing factors for aggression can be staff's inability to balance maintaining a therapeutic environment whilst enforcing security rules (Fallon et al., 1999). Others have argued that security and rehabilitation are rarely seen as complementary by practitioners, who believe that tightening security will damage therapeutic relationships and vice versa (Hodge & Renwick, 2002). Staff's knowledge of how to manage forensic patients whilst maintaining a therapeutic environment, also known as *relational security*, is noted to further create positive ward culture (Tighe & Gudjonsson, 2012) and is associated with lower incidents rates (Gadon et al., 2006; van der Helm et al., 2012). Nursing staff who know how to manage complex patients alongside identifying risk behaviours can regularly assess and monitor any changes in their mental state, and subsequently modify levels of restriction imposed, according to the needs of each individual patient (Collins & Davies, 2012). This allows staff to balance necessary security restrictions whilst maintaining a positive therapeutic environment, and ultimate positive culture of care.

However, the research on understanding how factors such as culture and environment can predict security incidents has been limited, with little consensus on what factors can affect a forensic client's aggression in secure care. However, a more recent study by Ireland et al. (2019) demonstrated several associations between social environment and security incidents in high secure settings. They noted that lower levels of forensic patient cohesion and therapeutic hold were associated with increased number of threats, whereas inappropriate behaviours were associated with forensic patients' feelings of being less involved with the service (Ireland et al., 2019). Ireland et al. (2019) demonstrated that environmental factors, such as poor cohesion, lack of therapeutic affiliations and less off-ward activities involvements, are all important predictors of forensic client aggression in secure settings.

To fully understand factors contributing to forensic client aggression, it is important to consider theoretical underpinnings, such as the implications of the Good Lives Model (Ward & Gannon, 2006). Whilst not without a critique, this is a strength-based approach, aiming to equip individuals with necessary capabilities to obtain primary human goals in meaningful and socially acceptable ways, as opposed to through the use of criminality (Ward & Gannon, 2006). As part of this, there resides the Self-Determination Model of Motivation (Deci and Ryan, 2000), where environmental conditions can allow or hinder the satisfaction of basic needs, including a desire for relatedness to others, competence and a sense of autonomy. Arguably correctional and other secure forensic settings can restrict attainment of these goals through the restrictive physical environment, including limited movement and access to off-ward activities that could maximise the achievement of such basic needs (Ireland et al., 2018). Similarly, the deprivation model, based on the works of Sykes (1958) and Goffman (1961), asserts that prisoners' adjustment is a consequence of oppressive and stressful conditions of secure settings (Bosma et al., 2020). Prisoners and high-secure forensic patients are held in environments that restrict or deprive them of their autonomy, security, freedom of movement, and access to

goods; thus resulting in increased stress, anger, and disruptive behaviour (Bosma et al., 2020). This potentially leads the forensic client to regard secure institutions as unfair and unjust, as their access to basic services is limited and strictly monitored. Indeed, earlier research has shown that those who perceive rules as fair and just are less likely to report misconduct (e.g. improper behaviour likely to lead to a reprimand) and are charged with less institutional violations (Reisig & Mesko, 2009). Further, prisoners who accept prison as a legitimate authority, are less likely to engage with rule breaking as opposed to those who reject it (Jackson et al., 2010).

Further, institutional violations can arise from environmental changes. For instance, and whilst the COVID-19 pandemic is not a direct focus of this paper, the deprivation effects it led to in recent years, through enhanced restrictions in secure services, resulted in increased patient aggression and incidents reports (e.g. Payne-Gill, Whitfield, & Beck, 2021). It further showed an overall increase in long-term segregations as well as incidents of physical aggression during this pandemic period (Puzzo et al., 2022). This reflects the continued importance of not only cultural but environmental aspects in the prediction of security incidents, including aggression, similar to those previously argued by Ireland et al (2019). This paper therefore argues the importance of revisiting key aspects from Ireland et al (2019), to determine what important factors may remain, and what may have changed. The goal of this paper is therefore to inform policy makers and legislators with an updated understanding, to ensure safe conduct and security of both staff and forensic clients alike. As such, it aims to do so by conducting a rapid evidence assessment of available literature since 2018 to assess the effect of various factors, including cultural and environmental, on aggressive security incidents in secure psychiatric and custodial settings, using the Ireland et al (2019) search terms as a start point for this REA.

Method

This Rapid Evidence Assessment was informed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Moher et al., 2009). The same search terms were used as in Ireland et al's (2019) study, that was originally developed using key words from the TILT tool (Tilt et al., 2000), used to record security incidents in secure psychiatric care. As such, and after review of this peer reviewed study, it presented as a good fit for search terms, searching after 2018. There were 25 search terms in total, combined, such as: (*Culture OR Atmosphere OR Environment OR Security) AND (Incident OR Misconduct OR Assault OR Aggress* OR Substance OR Boundar* OR Hostage OR Protest OR Rules) AND (Inpatient OR Psychiatric OR (Ward OR Hospital) OR (Prison OR Wing).*

Relevant studies were identified using PsycInfo, PsycArticles, and SCOPUS databases with the time range of January 2018 - July 2023. No manual search was performed, nor grey literature included. To be included for the final analysis, full-text articles were assessed based on the following inclusion criteria: (1) assessed the impact of cultural, environmental or security factors on one or more security factors, (2) used secure psychiatric, forensic or prison populations, (3) collected or reanalysed original data; and (4) written in English.

Results

The results of the full study selection procedure using PRISMA guidelines is presented in Figure 1.

[FIGURE 1 HERE]

Search Results

The chosen search strategy resulted in 4712 articles which, after the removal of duplicates, was reduced to 4700 articles. These were screened based on titles and abstracts, using the study selection criteria. This resulted in a final 61 articles being included, which

were assessed using full-text, resulting in exclusion of 30 articles that did not assess the impact of relevant factors, five that did not consider a forensic sample, one being a systematic review and two articles that were unavailable to the research team. This resulted in a final number of 23 studies included in this REA.

Study Characteristics

All studies were conducted in either prison (n = 8), psychiatric in-patient facility with involuntary or compulsory treatment (n = 7), and forensic secure services (n = 7), with one study looking at both general in-patient psychiatric hospital and forensic services. All but two studies had exclusively adult samples. Table 1 illustrates all methods and the main findings of each of the 23 reviewed studies. Only variables and characteristics that were relevant to the present review were discussed in each study.

[TABLE 1 HERE]

Thematic Analysis

Thematic analysis outlined by Thomas and Harden (2008) was used, where they adapted the thematic analysis used for interview transcripts for the use in systematic literature reviews. The main results of each paper were line coded, then organised into related themes. Four main themes were developed through this process, as illustrated in Figure 2. The main themes were (1) Inadequate living facilities and poor physical environment, (2) Institutional security levels predicting aggression, (3) Restricted movement and the lack of meaningful activities, (4) Ward atmosphere and staff factors impacting staff-client relationships and consequent aggression.

[FIGURE 2 HERE]

Theme 1: Inadequate living facilities and poor physical environment

Ward facilities and the physical environment as perceived by forensic clients were key factors contributing to security incidents. This theme was further split into two sub-themes: (1a) *Time of the day can predict the occurrence and type of patient violence* and *(1b) Overcrowding creates suffocating atmosphere and increases the likelihood of aggression*.

The physical environment of wards have been explored as potential factors contributing to patient aggression. Rogerson et al. (2021) found that wards with external views of both green spaces and person-made structures had higher rates of physical and verbal aggressive incidents in forensic and general mental health wards, compared to wards with views of green spaces only. They further found that removing carpets in the communal areas, in line with infection control regulations, led to the hardwood flooring increasing ward temperature and noise, thus leading to increased aggressive incidents (Rogerson et al., 2021).

An earlier study by Ulrich et al (2018), and similar to the factors explored by Rogerson et al. (2021), noted that new wards that had accessible gardens, and features designed to increase daylight and large windows overlooking the gardens, demonstrated a reduction in aggressive incidents requiring chemical but not physical restraint. Alternatively, Bridekirk et al. (2021) demonstrated that simply moving to a new building, despite it being designed to be bright, spacious, and conducive of patient recovery (Chen et al., 2013), actually increased the risk of inpatient violence, with the rates of aggressive incidents after the move remaining high over time. Yet, they further noted that, even when the move is intended to improve patient and staff experiences, the implementation of the desired improvements will depend on the local context and the organisation culture (Bridekirk et a., 2021; Marshall et al., 2019). Indeed, in Bridekirk et al. (2021) study, the move to the new building was also accompanied by "least restraint" initiative; it is this which could have impacted incidents rates, thus partially explaining their findings.

Sub-theme 1: Time of the day can predict the occurrence and type of patient violence

McNeeley (2021) reported that aggression was more likely to occur in the afternoon and the evening amongst prisoners. Another study found that the time of the day affects the type of weapons prisoners are most likely to use, with times between 9pm and 6am being characterised by the increased use of liquid weapons as compared to the physical force (Rodriguez & Waggoner, 2023). As such, staff are more likely to be targeted at this time by prisoners throwing liquids as they walk by the cells (Rodriguez & Waggoner, 2023). However, a study by Weltens et al (2023) did not find any statistical differences in the number of incidents between morning and evening, or morning and night on a high-intensive care unit of a mental health institution, thus showing some inconsistencies in the existing literature.

Sub-theme 2: overcrowding creates suffocating atmosphere and increases the likelihood of aggression

Overcrowding at the wards and bed occupancy exceeding maximum capacity were some of the key factors contributing towards high incident rates at prisons and mental health facilities. Weltens et al. (2023) noted that exceeding maximum bed capacity was found to be a significant risk factor for aggressive behaviour. Similarly, Ulrich et al. (2018) compared aggressive incidents rates between two hospitals, in which the newer hospital had spaces designed to facilitate lower social density (number of individuals in a reduced space); they found a significant reduction in this newer hospital as to the proportion of incidents resulting in administered chemical injections. These findings on crowding and aggression were further supplemented with subjective experiences of the nursing staff in psychiatric hospitals, who reported that overcrowded units were perceived as prison-like environments in which aggressive incidents and a suffocating atmosphere reminded staff of old-style ‘mental hospitals’ and ‘asylums’ (Missouridou et al., 2021).

Theme 2: Institutional security levels predicting aggression

The security level of the forensic environment was a clear predictor. Howard et al (2020) found that the likelihood of assault victimisations was almost 7 times higher for prisoners in medium security and 6 times higher for those in maximum security compared with prisoners in minimum security sites. These findings were reflected in those of assault perpetration, as shown by Bosma et al (2020) who found that harsher regimes in Dutch prisons had increased likelihood of self-reported misconduct. Tahamont (2019) reported that prisoners placed in medium security (level 2) prison were 11% more likely to be written up for misconduct for lowest level offences than prisoners in close security (level 3) prisons, whereas no effect was found for the maximum security (level 4).

Theme 3: Restricted movement and the lack of meaningful activities.

Restrictions on movement and a lack or absence of meaningful pursuits were key. For example, Williams and Haeney (2023) noted that locked doors, such as night-time confinement, do not necessarily increase patient and staff safety, and instead might actually contribute to increased patient aggression. Similarly, Schreiber et al. (2022) found that there was a decrease in adverse events at wards that adopted open doors policy between 8am and 8pm, but due to multiple comparisons, none of the changes were considered meaningful. Howard et al. (2020) further demonstrated that increased time spent in segregation was associated with an increased risk of being assaulted by other prisoners, further demonstrating the dangers of segregation and substantially restricted movement. By contrast, time spent in segregation or in prisoners' cells was associated with less likelihood of committing an assault against staff due to the physical barrier between staff and patients (McNeeley, 2021). Overall, these findings demonstrate there is some lack of consensus when it comes to the effects of open doors and segregation on patients and prisoner violence.

However, when considering restricted movement, the impact on aggression risk is somewhat clearer. Restricted movement is likely to result in increased boredom and lack of meaningful activities amongst forensic clients, which can in turn, contribute to increased aggressive behaviour. Bosma et al (2020) found that higher than average experiences, availability and access to meaningful activities was associated with a decreased number of self-reported prisoner misbehaviour. Meaningful activities in prison were also associated with reduced risk of assault, as shown in Howard et al. (2020), and where they found that increasing the number of hours in employment decreased the incidence of assault victimisations.

Yet, it is not just in regard to activities and employment, visitations are also considered a meaningful activity for forensic clients. Pierce et al (2018) found that increased frequency of visitations decreased serious misconduct in an adult male prison. Similarly, Reidy and Sorenson (2020) found that non-visited prisoners would commit significantly more disciplinary infractions compared to the visited group. The findings are mixed however, and where Bosma et al. (2020) found that prisoners who had received a visitor or reported satisfaction with the frequency of the contact actually had a higher rate of self-reported misbehaviours as compared to those who did not have contact. Yet, a potential explanation may be that contact with the outside world could increase feelings of deprivation and increase trafficking of contrabands (Bosma et al., 2020). Overall, it direct to a complex picture of understanding.

Theme 4: Ward atmosphere and staff factors impacting staff-client relationships and consequent aggression

Staff characteristics, as well as resulting relationships between staff and patients and the overall ward atmosphere can be an important factor contributing towards aggressive behaviour and misconduct in secure settings. For instance, higher levels of staff working experience was found as a significant risk factor for encountering aggressive behaviour (Weltens et al., 2023). Urheim (2020) further noted that gender did impact on aggression levels,

reporting significant reductions in yearly violence rates being associated with higher proportion of female staff, as well as higher staff educational level, mandatory treatment plans and shared staff and patient reviews after incidents. Furthermore, Bosma and colleagues (2020) reported that higher staff-prisoner ratios on the unit were associated with lower prisoner misconduct. They further noted that the prison climate, characterised by better perceived quality of staff-prisoner relationships, were related to lower reported and registered misconduct. Similarly, Puzzo et al. (2019) found that increased social climate and sense of community decreased incident reports on wards of a high secure hospital, whereas in another study, Puzzo (2023) found that an intervention aimed at improving social climate and sense of community in high-secure mental health settings had positive effects on violence reduction over time, thus further implying the importance of ward climate on violence reduction.

Discussion

The findings of this rapid evidence assessment (REA) revealed four themes associated with security incidents in correctional and forensic psychiatric case, and which continue to be of concern in recent times. These focused on inadequate ward facilities and atmosphere, poor physical environment, levels of security, restricted movements, lack of meaningful activities and varying staff factors. As such, this REA implicates the role of environmental, cultural and security factors on prisoners and forensic patients' aggression, offering support for the general components and interplay between Deprivation Theory, Good Lives Model and General Strain Theory.

Studies identified in this REA have generally demonstrated that poor environmental conditions such as poor temperature regulations, structural design, and overcrowding, are significant contributors to a forensic clients aggressive incidents, and continue to be so. This aligns with the stipulations of the seminal General Strain Theory (Agnew, 1992, 2001, 2009), which posits that individuals who experience stressors or deprivation will become agitated,

frustrated, and engage in criminal activities to cope with these strains (Agnew & Brezina, 2019). While General Strain Theory has been used to mainly describe behaviours of individuals in the community, its applications are relevant in secure settings such as these. As indicated by Blevins et al. (2010), entering prison or forensic settings are highly stressful as they impose a number of different strains on individuals. These are varied and can include the denial of positively valued goods (e.g., disjuncture between just and actual outcomes), removal of positively valued stimuli (e.g., loss of comforts of life, such as loss of a job or friends), and presentation of noxious provocations (e.g., high noise levels, crowded, poor living conditions, strict institutional rules and schedules). One of the most commonly researched noxious stimuli, overcrowding, is a significant contributor to aggression, with staff describing it as relating to a suffocating atmosphere of old-style 'mental hospitals' and 'asylums' (Missouridou et al., 2021). Not surprisingly, when presented with such conditions, forensic clients are likely to experience heightened levels of arousal leading to frustration, anger, and aggression (Blevins et al., 2010). All of these observations were supported in this REA, with several studies demonstrating that overcrowding and poor living conditions continue to contribute even in more recent times to a patients' aggression and increased rate of aggressive incidents (e.g. Weltens et al., 2023; Ulrich et al., 2018). This is exacerbated further by residing in close quarters with other forensic clients in dormitory-style housing units, further increasing stress and imposing strain due to lack of privacy or increased risk of victimization (Blevins et al., 2010). In this current REA, secure institutions designed to reduce social density and crowding showed lower aggressive incident rates compared to less modern hospitals (Ulrich et al., 2018), thus demonstrating the importance of physical environmental factors on patient aggression, such as overcrowding.

Furthermore, as posited by both General Strain Theory as well as Good Lives Model, individuals who perceive unfair treatment or illegitimate authority, will be more likely to

experience a range of negative emotions such as anger and resentment (e.g. Agnew, 2009), thus engaging in security violations and aggressive incidents. Loss of freedom and autonomy are common in secure settings in which restrictive living conditions are enforced, characterised by strict institutional policies, locked doors, and regular monitoring; all of which can increase stress, frustration and disruptive behaviour (Bosma et al., 2020). This can arguably place forensic clients at risk of regarding secure care as unfair due to their restricted access to and monitoring of basic goods.

Such frustrations and increase of aggression can be further increased by the locked environments, such as wards, and impoverished environments, exacerbated by a lack of meaningful activities, increasing boredom and amplifying the feelings of deprivation (Bosma et al., 2020). As the General Strain Theory posits, denying forensic clients services and programs can induce further strain as it prevents the forensic client from achieving positively valued goals (Blevins et al., 2010), leaving them unable to acquire monetary outcomes and vocational skills that could affect their ability to obtain parole or early release. As argued by the Good Lives model, individuals need to be equipped with necessary capabilities to obtain primary human goals in meaningful and socially acceptable ways (Ward & Gannon, 2003), and in order to prevent offending and disruptive behaviour. Therefore, this lack of access to meaningful activities and overly restrictive environments can result in increased anger and resentment, arguably leading to aggressive behaviour and security incidents, as reflected in this REA, as well as previous research (Ireland et al., 2019).

Locked wards and a restrictive environment not only impact on the forensic client, and in some instances quite rightly so and in order to protect themselves and others, but it can further impose significant strain on them, but also staff members. For example, psychiatric nurses working in secure forensic units felt it would undermine their role of a nurse and impact the therapeutic relationship with their clients (e.g. Missouridou et al., 2021). It is certainly a

careful balance with offering care to the forensic client, yet also ensuring the safety of those around them, creating strain in its very attempt. As noted previously, staff can often see security and rehabilitation as opposite to one another, as tight security tends to damage therapeutic relationships (Hodge & Renwick, 2002). That aside, the staff relationships with forensic clients are crucial, and where staff can play an important mediating role between security and therapeutic care. For instance, a more hostile interpersonal style from staff is then associated with increased number of threats and incidents rates (Ireland et al., 2019). The importance of this is mirrored in this REA. Further, and in regard to General Strain Theory, negative relationships with others are known to be a major cause of strain and thus, are an important risk factor for aggressive behaviour (Agnew, 1992, 2001, 2009). Similarly, stipulations of the Self-Determination Theory (Deci & Ryan, 2000) emphasise the importance of having supportive relationships in order to positively change behaviours. These previous findings were supported by this REA as continuing concerns, as several studies demonstrated that positive staff-prisoner relationships, good ward atmosphere and empathetic and supportive therapeutic relationships are associated with decreased incident rates and overall feelings of safety (e.g., Bosma et al., 2020; De Decker et al., 2018; Magnowski & Cleveland, 2020). Therefore, this demonstrates it is essential for policymakers to continue to consider how to prioritise and emphasise positive staff-patient relationships all while maintaining secure working and housing environment, to reduce security incidents.

Despite the important findings and implications, this review has limitations in attempting to understand a complex area. An REA is of course a briefer consideration of the literature, and many of the studies included self-reported incident data, and perceptions of safety, with a few studies not being linked to actual incident reports, thus limiting the validity of the findings. Further, the research area is not developed enough to consider in regard to differing levels of security or across different forensic settings. Therefore, not all

considerations and recommendations will have been captured, but more those directly informed from the REA. For instance, there are likely to be additional characteristics and physical environment components that have not been identified by this REA. Furthermore, some studies that compared incident reports between two hospitals with improved environmental design did not always control for other factors that could have impacted the incident levels. Additionally, these types of analyses typically grouped all the variables together, thus making the interpretation of the findings more challenging. No grey literature was searched and thus, it is possible some important findings have been left out of the present analysis.

Conclusion

Overall, the results of this REA have demonstrated that several factors continue to contribute to aggressive security incidents in correctional and forensic psychiatric care. Physical environment, lack of meaningful activities and poor staff-patients relationships seem to be some of the key factors in understanding why such incidents occur. As such, policy makers and key legislators should aim to improve poor physical environments of current and prospective hospitals and prisons to facilitate better therapeutic environment, improved staff-patient relationships and better patient satisfaction, and ultimately ensure safer housing and working conditions for both patients and staff alike. It would appear that progress in this area continues to be required.

Implications for Practice

- The physical environment of the forensic clients living conditions continues to play a pivotal role in aggression risk, requiring careful consideration.
- Any changes to the environment needs to be attuned to the organisational culture if the potential to reduce aggression is to be maximised.
- Overcrowding continues to lead to increases in aggression.

- The definition of meaningful activity can be broad, yet a failure to attend to these activities is likely to increase aggression risk.
- Positive staff-client relationships are critical in reducing aggression risk, alongside a sense of community and cohesion.

References

Agnew, R. (1992) Foundation for a general strain theory of crime and delinquency. *Criminology*, 30, 47-87.

Agnew, R. (2009). General strain theory: Current status and directions for further research. In F. T. Cullen, J. P. Wright, & K. R. Blevins (Eds.), *Taking stock: The status of criminological theory* (pp. 101-123). New Brunswick, NJ: Transaction.

Agnew, R. (2009). Building on the foundation of general strain theory: Specifying the types of strain most likely to lead to crime and delinquency. In *Recent developments in criminological theory* (pp. 311-354). Routledge.

Agnew, R., & Brezina, T. (2019). General strain theory. *Handbook on crime and deviance*, 145-160.

Bekelepi, N., & Martin, P. (2022). Experience of violence, coping and support for nurses working in acute psychiatric wards. *South African journal of psychiatry*, *28*, 1-7.

Blevins, K. R., Johnson Listwan, S., Cullen, F. T., & Lero Jonson, C. (2010). A general strain theory of prison violence and misconduct: An integrated model of inmate behavior. *Journal of Contemporary Criminal Justice*, *26*(2), 148-166.

Blom-Cooper, L., Brown, M., Dolan, R., & Murphy, E. (1992). *Report of the Committee of Inquiry Into Complaints at Ashworth Hospital Volume 1*. Stationery Office.

Bosma, A. Q., C. van Ginneken, E. F., Sentse, M., & Palmen, H. (2020). Examining prisoner misconduct: A multilevel test using personal characteristics, prison climate, and prison environment. *Crime & Delinquency*, *66*(4), 451-484.

Bowker, L. H. (1980). *Prison victimization*. New York: Elsevier.

Bridekirk, J., Ham, E., Ball, L. C., & Konkolÿ Thege, B. (2021). Beyond Window Dressing: Does Moving to a New Building Really Shape the Perception of, and Actual Safety on Forensic Inpatient Programs?. *International Journal of Forensic Mental Health*, *21*(3), 273-286.

Carlson, B.E., & Cervera, N. (1992). *Inmates and their wives: Incarcerations and family life*. Westport, CT: Greenwood

Chen, S. P., Krupa, T., Lysaght, R., McCay, E., & Piat, M. (2013). The development of recovery competencies for in-patient mental health providers working with people with serious mental illness. *Administration and Policy in Mental Health, 40*(2), 96–116.

Cooke, D. J. (1991). Violence in prisons: the influence of regime factors. *The Howard Journal of Criminal Justice*, *30*(2), 95-109.

Collins, M., & Davies, S. (2005). The Security Needs Assessment Profile: a multidimensional approach to measuring security needs. *International Journal of Forensic Mental Health*, *4*(1), 39-52.

Daffern, M., Mayer, M. M., & Martin, T. (2004). Environment contributors to aggression in two forensic psychiatric hospitals. *International Journal of Forensic Mental Health*, *3*(1), 105-114.

Deci, E.L. & Ryan, R.M. (2000). The "what" and the "why" of goal pursuits: Human needs and the self–determination of behavior. *Psychological Inquiry, 11*, 227–268.

de Decker, A., Lemmens, L., Van der Helm, P., Bruckers, L., Molenberghs, G., & Tremmery, S. (2018). The relation between aggression and the living group climate in a forensic treatment unit for adolescents: A pilot study. *International Journal of Offender Therapy and Comparative Criminology*, *62*(7), 1821-1837.

Dosen, A. S., & Ostwald, M. J. (2016). Evidence for prospect-refuge theory: a meta-analysis of the findings of environmental preference research. *City, Territory and Architecture*, *3*, 1-14.

Douglas, K.S., Hart, S.D., Webster, C.D., & Belfrage, H. (2013). *HCR-20 v3: Assessing Risk for Violence*. Mental Health, Law, and Policy Institute, Simon Fraser University, US.

Drakeford, L. (2020). Moral communities and institutional misconduct: A reassessment of religious contextual influences on inmate behavior. *Crime & Delinquency*, *66*(8), 1137-1160.

Duxbury, J., & Whittington, R. (2005) Causes and management of patient aggression and violence: staff and patient perspectives. *Journal of Advanced Nursing*, 50 (5), 469-478.

Fallon, P., Bluglass, R., Daniels, G., & Edwards, B. (1999). *Report of the Committee of Inquiry Into the Personality Disorder Unit, Ashworth Special Hospital Volume 1*. HM Stationery Office.

Fletcher, J., Hamilton, B., Kinner, S. A., & Brophy, L. (2019). Safewards impact in inpatient mental health units in Victoria, Australia: Staff perspectives. *Frontiers in Psychiatry*, *10*, 1-10.

Gadon, L., Johnstone, L., & Cooke, D. (2006). Situational variables and institutional violence: A systematic review of the literature. *Clinical Psychology Review*, *26*(5), 515-534.

Gerberich, S. G., Church, T. R., McGovern, P. M., Hansen, H. E., Nachreiner, N. M., Geisser, M. S., ... & Watt, G. D. (2004). An epidemiological study of the magnitude and consequences of work related violence: the Minnesota Nurses' Study. *Occupational and environmental medicine*, *61*(6), 495-503.

Goffman, E. (1961). *Encounters: Two studies in the sociology of interaction*. Indianapolis, IN: Bobbs-Merrill.

Hansen, A. L., Bi, P., Nitschke, M., Ryan, P., Pisaniello, D., & Tucker, G. (2008). The effect of heatwaves on mental health in a temperate Australian city. *Environmental Health Perspectives*, *116*(10), 1369 – 1375.

Hodge, J. E., & Renwick, S. J. (2002). Motivating mentally disordered offenders. *Motivating offenders to change: A guide to enhancing engagement in therapy*, 221-234.

Hollen, V., Ortiz, G., Schacht, L., Mojarrad, M. G., Lane Jr, MA, MPH, G. M., & Parks, J. J. (2010). Effects of adopting a smoke-free policy in state psychiatric hospitals. *Psychiatric Services*, *61*(9), 899-904.

Howard, M. V., Corben, S. P., Raudino, A., & Galouzis, J. J. (2020). Maintaining safety in the prison environment: A multilevel analysis of inmate victimisation in assaults. *International Journal of Offender Therapy and Comparative Criminology*, *64*(10-11), 1091-1113.

Ireland, C. A., Ireland, J. L., Jones, N. S., Chu, S., & Lewis, M. (2019). Predicting security incidents in high secure male psychiatric care. *International Journal of Law and Psychiatry*, *64*, 40-52.

Jackson, J., Tyler, T. R., Bradford, B., Taylor, D., & Shiner, M. (2010). Legitimacy and procedural justice in prisons. *Prison Service Journal*, *191*, 4-10.

Jiang, S., Fisher-Giorlando, M., & Mo, L. (2005). Social support and inmate rule violations: A multilevel analysis. *American Journal of Criminal Justice*, 30, 71-86.

Kelly, E. L., Fenwick, K. M., Brekke, J. S., & Novaco, R. W. (2021). Sources of social support after patient assault as related to staff well-being. *Journal of Interpersonal Violence*, *36*(1-2), NP1003-NP1028.

Lahm, K. F. (2009). Inmate assaults on prison staff: A multilevel examination of an overlooked form of prison violence. *The Prison Journal*, *89*(2), 131-150.

Levin, P. F., Hewitt, J. B., & Misner, S. T. (1998). Insights of nurses about assault in hospital-based emergency departments. *The Journal of Nursing Scholarship*, *30*(3), 249-254.

Liebling, A., Durie, L., Stiles, A., & Tait, S. (2005*) Revisiting prison suicide: the role of fairness and distress*. In Liebling, A., & Maruna, S. (Eds) The Effects of Imprisonment. Cullompton: Willan.

Magnowski, S. R., & Cleveland, S. (2020). The impact of milieu nurse–client shift assignments on monthly restraint rates on an inpatient child/adolescent psychiatric unit. *Journal of the American Psychiatric Nurses Association*, *26*(1), 86-91.

Marshall, L. A., Adams, E. A., & Stuckey, M. I. (2019). Relationships, experience, and support: Staff perception of safety in a forensic mental health facility. *The Journal of Forensic Psychiatry & Psychology*, *30*(5), 824–835.

McNeeley, S. (2021). Situational risk factors for inmate-on-staff assaults. *The Prison Journal*, *101*(3), 352-373.

Missouridou, E., Resoulai, A., Sakavara, I., Fradelos, E. C., Kritsiotakis, E., Mangoulia, P., ... & Evagelou, E. (2021). Psychiatric care in acute care units with locked doors: nursing care providers' perceptions and experiences. In *GeNeDis 2020: Geriatrics* (pp. 99-106). Springer International Publishing.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group, T. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Annals of Internal Medicine*, *151*(4), 264-269.

NHS (2021, February 21). *Service specification: High secure mental health services (Adult).* Accessed from https://www.england.nhs.uk/publication/service-specification-high-secure-mental-health-services-adult/

Office, N. A. (2003). A safer place to work. Protecting NHS Hospital and ambulance staff from violence and aggression.

Paulus, P. B., & Paulus, P. B. (1988). Effects of Crowding in General. *Prisons Crowding: A Psychological Perspective*, 7-13.

Payne-Gill, J., Whitfield, C., & Beck, A. (2021). The impact of the UK's first COVID-19 lockdown on rates of violence and aggression on psychiatric inpatient wards. *MedRxiv*, 2021-03.

Pierce, M. B., Freiburger, T. L., Chapin, J. R., Epling, B., & Madden, T. J. (2018). Assessing the impact of visitation on inmate misconduct within a county jail. *Security Journal*, *31*, 1-20.

Puzzo, I., Aldridge-Waddon, L., Bush, E., & Farr, C. (2019). The relationship between ward social climate, ward sense of community, and incidents of disruptive behavior: a study of a high secure psychiatric sample. *International Journal of Forensic Mental Health*, *18*(2), 153-163.

Puzzo, I., Aldridge-Waddon, L., Stokes, N., Rainbird, J., & Kumari, V. (2022). The impact of the COVID-19 pandemic on forensic mental health services and clinical outcomes: a longitudinal study. *Frontiers in Psychiatry*, *12*, 1-12.

Puzzo, I., Aldridge-Waddon, L., Morley, E., Vacher, J., Mitchell, J., Murphy, D., & Farr, C. (2023). Developing ward social climate and sense of community within a high security forensic psychiatric service: Evaluating a sense of community and social climate intervention. *The Journal of Forensic Psychiatry & Psychology*, *34*(1), 20-36.

Reidy, T., & Sorensen, J. (2020). Visitation and misconduct among maximum-security inmates. *The Prison Journal*, *100*(4), 447-467.

Reisig, M.D., & Mesko, G. (2009) Procedural justice, legitimacy and prisoner misconduct. *Psychology, Crime and Law*, 15, 41-59

Riad-Allen, L., Dermody, S. S., Herman, Y., Bellissimo, K., Selby, P., & George, T. P. (2017). Becoming tobacco-free: Changes in staff and patient attitudes and incident reports in a large academic mental health and addictions hospital. *The American Journal on Addictions*, *26*(2), 183-191.

Richter, D., & Berger, K. (2006). Post-traumatic stress disorder following patient assaults among staff members of mental health hospitals: a prospective longitudinal study. *BMC Psychiatry*, *6*, 1-4.

Rodriguez, N., & Waggoner, K. (2023). Space matters: An examination of the circumstances surrounding violence against correctional staff. *Journal of Criminal Justice*, *86*, 1-10.

Rogerson, M., Haines-Delmont, A., McCabe, R., Brown, A., & Whittington, R. (2021). The relationship between inpatient mental health ward design and aggression. *Journal of Environmental Psychology*, *77*, 101670.

Royer, A., & Cantinotti, M. (2008). *Évaluation de la formation en cessation tabagique offerte aux agents de soins de santé des établissements de détention de Québec, Rivière-des-*

Prairies et Montréal (Bordeaux). Québec, QC: Direction de santé publique de la Capitale-Nationale.

Schreiber, L. K., Metzger, F. G., Flammer, E., Rinke, H., Fallgatter, A. J., & Steinert, T. (2022). Open Doors by Fair Means: a quasi-experimental controlled study on the effects of an open-door policy on acute psychiatric wards. *BMC Health Services Research*, *22*(1), 941.

Sparks, R., & Bottoms, A.E. (2008) *Legitimacy and imprisonment revisited: Some notes on the problem of order ten years after*. In Byrne, J.M., Hummer, D., & Taxman, F.S. (Eds) The Culture of Prison Violence. Boston: Allyn & Bacon, 91-104.

Sykes, G. (1958). The pains of imprisonment. *The society of captives: A study of a maximum security prison*, 63-78.

Tahamont, S. (2019). The effect of facility security classification on serious rules violation reports in California prisons: a regression discontinuity design. *Journal of Quantitative Criminology*, *35*, 767-796.

Talaei, A., Hedjazi, A., Rezaei Ardani, A., Fayyazi Bordbar, M. R., & Talaei, A. (2014). The relationship between meteorological conditions and homicide, suicide, rage, and psychiatric hospitalization. *Journal of Forensic Sciences*, *59*(5), 1397-1402.

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology*, *8*, 1-10.

Tighe, J., & Gudjonsson, G. H. (2012). See, Think, Act Scale: preliminary development and validation of a measure of relational security in medium-and low-secure units. *The Journal of Forensic Psychiatry & Psychology*, *23*(2), 184-199.

Ulrich, R. S., Bogren, L., Gardiner, S. K., & Lundin, S. (2018). Psychiatric ward design can reduce aggressive behavior. *Journal of Environmental Psychology*, *57*, 53-66.

Uppal, G., & McMurran, M. (2009). Recorded incidents in a high-secure hospital: A descriptive analysis. *Criminal Behaviour and Mental Health*, *19*(4), 265-276.

Urheim, R., Palmstierna, T., Rypdal, K., Gjestad, R., Senneseth, M., & Mykletun, A. (2020). Violence rate dropped during a shift to individualized patient-oriented care in a high security forensic psychiatric ward. *BMC Psychiatry*, *20*, 1-10.

van der Helm, P., Stams, G. J., van Genabeek, M., & van der Laan, P. (2012). Group climate, personality, and self-reported aggression in incarcerated male youth. *The Journal of Forensic Psychiatry & Psychology*, *23*(1), 23-39.

van der Laan, A., & Eichelsheim, V. (2013). Juvenile adaptation to imprisonment: Feelings of safety, autonomy and well-being, and behaviour in prison. *European Journal of Criminology*, *10*(4), 424-443.

van Leeuwen, M. E., & Harte, J. M. (2017). Violence against mental health care professionals: prevalence, nature and consequences. *The Journal of Forensic Psychiatry & Psychology*, *28*(5), 581-598.

Van Lange, P. A., Rinderu, M. I., & Bushman, B. J. (2017). Aggression and violence around the world: A model of CLimate, Aggression, and Self-control in Humans (CLASH). *Behavioral and Brain Sciences, 40*, 1-58.

Wang, B., & Chen, D. 2013: Evidence for seasonal mania: a review. *Journal of Psychiatric* Practice, 19(4), 301–308.

Ward, T. and Gannon, T. A. (2006) Rehabilitation, etiology and self-regulation: the comprehensive good lives model of treatment for sexual offenders. *Aggression and Violent Behaviour*, 11(1), 77-94

Weltens, I., Bak, M., Verhagen, S., Vandenberk, E., Domen, P., van Amelsvoort, T., & Drukker, M. (2021). Aggression on the psychiatric ward: prevalence and risk factors. A systematic review of the literature. *PloS One*, *16*(10), 1-34.

Weltens, I., Drukker, M., van Amelsvoort, T., & Bak, M. (2023). Staff and ward factors associated with aggression development on an acute closed psychiatric ward: an experience sampling method study. *BMJ open*, *13*(2), e067943.

Williams, R., & Haeney, O. (2023). Does ending night-confinement reduce use of seclusion and prevalence of violence in a forensic psychiatric hospital? A retrospective observational study. *Psychiatry, Psychology and Law*, *30*(2), 123-132.

Wolf, T., Fabel, P., Kraschewski, A., & Jockers-Scherübl, M. C. (2021). From wish to reality: soteria in regular care—Proof of Effectiveness of the implementation of soteria elements in acute psychiatry. *Frontiers in Psychiatry*, *12*, 685779.

Wooldredge, J. (1997). Explaining variation in perceptions of inmate crowding. *The Prison Journal*, 77, 27-40.

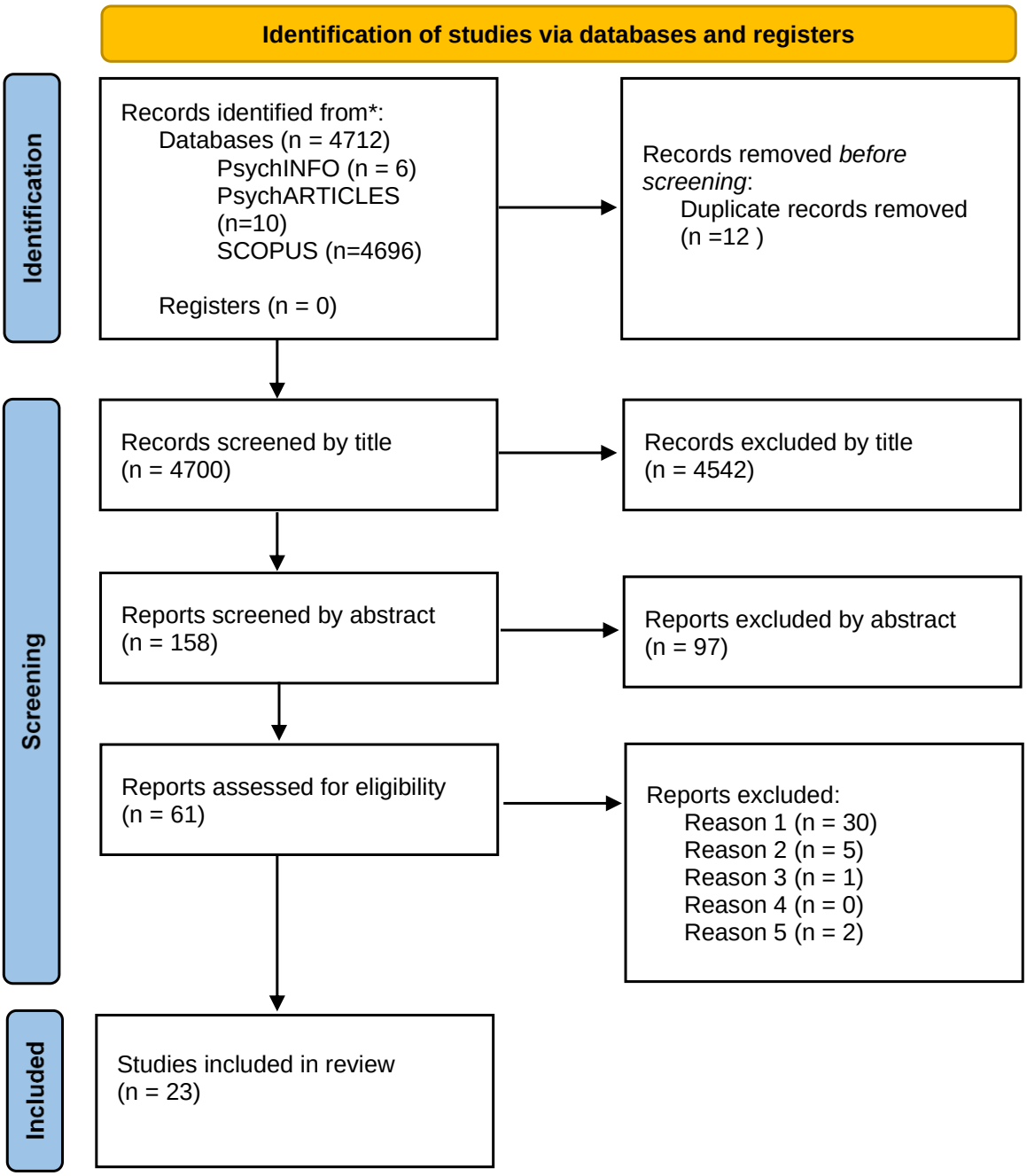

Figure 1. PRISMA flow diagram depicting papers included and excluded at each stage of the search process

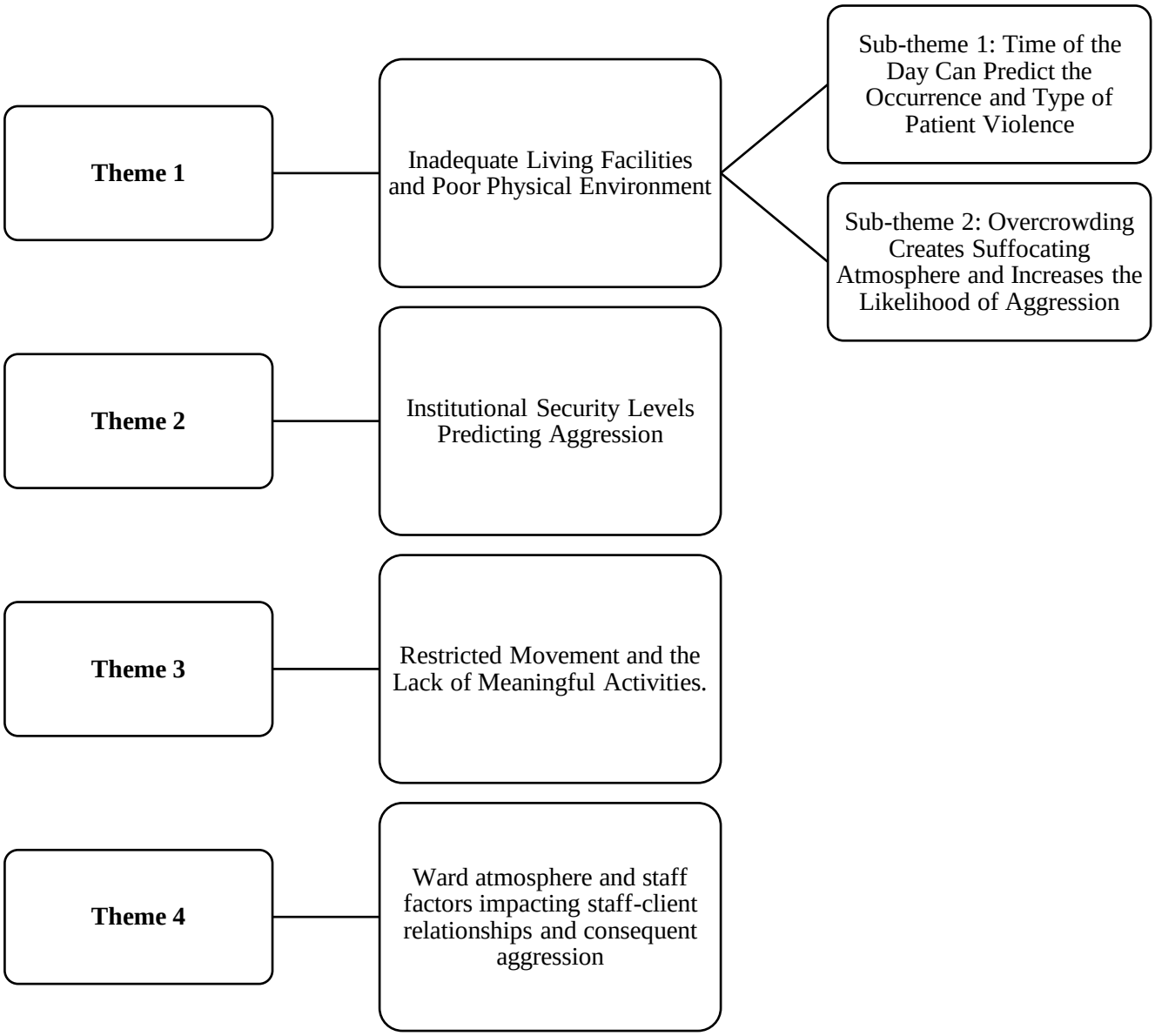

Figure 2. The visual representation of generated themes

Table 1. Summary of main findings and methodologies of included studies

Authors	Aims	Type of incident	Setting	Study methods	Study findings
Bekelepi & Martin (2022)	Qualitatively explored nurses' experiences of patient violence	Violent behaviour	Secure psychiatric hospitals	A semi-structured interviews assessed nurses' experiences of being assaulted, and support received	Changes in hospital smoking policy, patient diagnosis and type of admission were identified as factors contributing to violent behaviour.
Bosma, van Ginneken, Sentse, & Palmen (2020)	Assessed the extent to which prisoner characteristics and prison environment are related to misconduct	Prisoner misconduct	Prison	Self-reported and record-based incident data used to assess whether prison climate and environment affect misconduct	Better perceived quality of staff–prisoner relationships, higher staff-prisoner ratios and meaningful activities were related to lower misconduct. Visitations, contact and harsher regimes were related to higher self-reported misconduct.
Bridekirk, Ham, Ball & Konkolÿ Thege (2021)	Determined to what extent changes in perceived safety among staff and inpatients were attributed to changes in the physical environment	Violent incidents involving restraint or seclusion	Forensic psychiatric facility	Questionnaire (EssenCES; RSA-R) and record-based data used to evaluate whether a move to a new environment affects perceived safety, social climate and violent incidents	The rates of violent incidents drastically increased after moving to the new building and remained high over time

Authors	Aims	Type of incident	Setting	Study methods	Study findings
de Decker, Lemmens, Van der Helm, Bruckers, Molenberghs & Tremmery (2018)	Investigated the relationship between aggression and the living group climate as perceived by the adolescents.	Aggressive incidents	Forensic adolescent treatment unit	Measured living group climate using Prison Group Climate Inventory (PGCI) to see whether it predicts aggressive incidents	Lower and less severe aggressive incidents were related to an increased perception of support and possibilities for personal growth. No significant differences for aggressive incidents and perception of group atmosphere and repression.
Drakeford (2020)	Explored the relationship between religious context and inmate misconduct	Physical and verbal assaults and other rule infractions	Prison	Used 2004 Survey of Inmates in State and Federal Correctional Facilities data on whether participation in religious activities is associated with misconduct	The increase in religious concentration was inversely associated with inmate misconduct in mostly religious prisons.
Fletcher, Hamilton, Kinner, & Brophy (2019)	Investigated staff perceptions of the Safewards model and how it impacts ward atmosphere and conflict events	Conflict events including physical and verbal incidents, property damage and absconding	Inpatient mental health wards including secure units	Survey administered to staff members regarding the acceptability, applicability, and impacts of the Safewards model.	45% and 55% of staff perceived Safewards to usually or always positively impact physical and verbal conflict, respectively, while only 30% and 35% felt it positively

Authors	Aims	Type of incident	Setting	Study methods	Study findings
					impacted absconding and property damage.
Howard, Corben, Raudino, & Galouzis (2020)	Examined inmate- and facility-level predictors of harm in physical assault	Assault victimization	Prison	Record-based data used to determine associations between formal controls (security level, routine hours out of cells) or factors that influence institutional capacity for control (population, crowding, inmate turnover) and outcomes for inmates.	Inmate routine activities and time in disciplinary segregation or protection units significantly predicted assault victimization, which was higher in medium and maximum-security sites and with more time out of cells. Population, crowding, and inmate turnover were not significant predictors.
Magnowski & Cleveland (2020)	Identified the impact of milieu nurse–client shift assignments compared to individual nurse–client shift assignments	Monthly restraint rates	Child/adolescent psychiatric unit	The intervention using innovative nurse shifts (milieu nurse-client shifts) was implemented which called for the presence of 3 nurses	The milieu nurse–client shift assignments positively affected the monthly restraint rate when compared with individual assignments, with significantly less restraints being used.
McNeeley (2021)	Examined situational characteristics that are common in inmate-on-staff assaults.	Assault	Prison	Used record-based data to assess whether situational characteristics such as time of the day, location, property	Violence was more likely in the afternoon and evening, and inmates were less likely to assault staff in segregation or

Authors	Aims	Type of incident	Setting	Study methods	Study findings
				search, and others, were related the aggressive incidents.	their cells. Physical force by staff increased the likelihood of inmate assaults, while verbal threats did not.
Missouridou, Resoulai, Sakavara, Fradelos, Kritsiotakis, Mangoulia, ... & Evagelou (2021)	Qualitatively explored perceptions of the nursing care providers of psychiatric care in units with locked doors	General aggression	Psychiatric units with locked wards	Interviewed 15 nursing care staff members who provide services to psychiatric patients in locked wards	Overcrowded locked units were seen as a "prison" like environment in which aggression incidents, a great distance in therapeutic relationships, and a suffocating atmosphere remind staff of old-style asylums. There were also many perceived benefits of locked-doors policy such as limit setting, better ward control and perceived safety.
Pierce, Freiburger, Chapin, Epling & Madden (2018)	Investigated how inmate visitation affects violent misconduct	Minor and serious misconduct (e.g., assault, fighting)	Prison	Record based data used to determine whether visitations decrease institutional misconduct	Serious misconduct decreased with an increased number of visitations

Authors	Aims	Type of incident	Setting	Study methods	Study findings
Puzzo, Aldridge-Waddon, Bush & Farr (2019)	Investigated whether social climate and sense of community (SOC) can predict occurrence and frequency of disruptive behaviours	Disruptive behaviour	High secure psychiatric hospital	The study used a correlational design between social climate, sense of community and disruptive behaviour. EssenCES was used to measure social climate and SCI-2 to measure SOC.	Both social climate and SOC significantly predicted overall incident reports reduction on the wards. Only SOC was found to significantly predict non-physical incidents.
Puzzo, Aldridge-Waddon, Morley, Vacher, Mitchell, Murphy, & Farr (2023)	Evaluated an intervention designed to improve ward social climate and sense of community	Incidents (e.g., physical and non-physical assault)	High-secure psychiatric hospital	Questionnaire (EssenCES; SCI-2) and record-based incident data were used to compare before and after the intervention aimed to increase sense of community.	Perceived high social climate predicted an increase in violence reduction over time
Reidy & Sorensen (2020)	Explored the relationship between visitation and violent behaviour and misconducted of maximum-security prisoners.	Violent incidents and disciplinary infractions	Maximum-security prison	Utilised propensity score matching (PSM) and compared the rate of various types of violent incidents between visited and non-visited inmates.	Non-visited inmates committed 25% more major infractions and twice as many injurious violations compared to visited inmates; but the 25% increase in violent and injurious behaviours was not statistically significant.

Authors	Aims	Type of incident	Setting	Study methods	Study findings
Rodriguez & Waggoner (2023)	Examined the relationship between spatial factors and the circumstances that surround violence expressed towards staff	Violent incidents including use of items, no weapon, liquids and bodily fluids	Prison	Incident reports used to assess whether security level, crowding, location and time were related to type of violence experienced by the staff	Maximum security inmates preferred item and liquid weapons over physical force. Crowding reduced item weapon use but increased liquid weapon use. Item weapons were more common outside housing spaces, while liquid weapons were more common overnight (9 pm to 6 am).
Rogerson, Haines-Delmont, McCabe, Brown & Whittington (2021)	Investigated the association between ward design characteristics and recorded inpatient aggression	Aggressive incidents	Forensic and general adult mental health wards	Environment and ward characteristics measured using the Ward Features Checklist, and staff perceptions of safety measured using Work Safety Scale. Aggressive incidents were measured using record-based data.	Higher scores on the 'staffing and space' dimensions had more physical, verbal, and property damage incidents, while high 'comfort and facilities' scores were linked to increased physical incidents. Wards with views of both green space and man-made structures had higher physical and verbal aggression rates

Authors	Aims	Type of incident	Setting	Study methods	Study findings
					than those with only green views.
Schreiber, Metzger, Flammer, Rinke, Fallgatter, & Steinert (2022)	To investigate the effects of an open-door policy on aggressive incidents in psychiatric acute care units.	Aggressive incidents including severe self-harm, absconding, suicides, and suicide attempts	Psychiatric hospital with involuntary admissions	Compared two intervention wards and two control wards at two different sites with intervention wards having open doors between 8am and 8pm	A significant increase of adverse events was observed at the control ward regarding the use of coercive measures, while most adverse events decreased in intervention wards.
Tahamont (2019)	Investigated the causal relationship between facility security placement and prison misconduct	Serious rules violation which includes any activity that would qualify as a crime outside the prison	Prison	Estimated causal relationship between facility security placement (level 1 to 4) on the prevalence of prison misconduct, by using serious rules violation report as the outcome variable.	Inmates in medium security prisons are 11% more likely to be written up than inmates placed in close security prisons, mainly for lowest level offenses like bartering and gambling. No effect of maximum-security prisons on rules violation was found.
Ulrich, Bogren, Gardiner, & Lundin (2018)	Explored how hospital design features influence aggressive behaviour in psychiatric hospitals	Incidents resulting in chemical and physical restraints	Psychiatric hospital with compulsory care patients	Compared aggressive incidents between older and newer hospital that had wards	Significant reduction in the administered injections between the Old hospital and the New hospital. No

Authors	Aims	Type of incident	Setting	Study methods	Study findings
				designed to reduce stress and aggression.	significant difference in terms of physical restraints.
Urheim, Palmstierna, Rypdal, Gjestad, Senneseth & Mykletun (2020)	Examined the relationship between changes in individualized patient-oriented care and violence rates	Violent incidents	High secure forensic hospital	Violent incidents were recorded using Staff Observational Aggression Scale (SOAS). Care- and organisation-level variables were analysed (e.g., patient activity program, change in medication policy, violence risk assessment, etc)	Significant reduction in yearly and monthly incident rates, associated with higher staff education, higher proportion of female staff, shared staff-patient review after incidents, MDT treatment plans, fewer sedatives, new legislation and higher patient turnover.
Weltens, Drukker, van Amelsvoort & Bak (2023)	Investigated how ward configurations and behavioural and emotional variations of nurses affect aggression.	Aggression	Closed unit of a mental health hospital with involuntary admissions	Usded PsyMate, a web-based platform for moment-to-moment assessment of mood and behaviour.	The staff factors, such as 'working experience' and 'nurse being in the company of a patient' and the ward factors, such as 'exceeding maximum bed capacity' were found to be significant risk factor for aggressive behaviour. Time of day and the ward atmosphere were not significant predictors.

Authors	Aims	Type of incident	Setting	Study methods	Study findings
Williams & Haeney (2023)	Investigated the effects of night-confinement on incidents of violence	Violent incidents	Forensic psychiatric facility	Record-based data used to assess the effect of cessation of night-confinement on violent incidents, seclusion, and restraint events	Night confinement did not lead to increased use of seclusion, or increased levels of violence
Wolf, Fabel, Kraschewski, & Jockers-Scherübl (2021)	Explored the effects of the complex intervention SOTERIA on the frequency of special incidents, coercive measures, treatment duration	Assaults	Inpatient psychiatric ward with detained patients	Record-based data used to analyse whether open-ward with small, community-like, intensive, and interpersonally focused therapeutic milieu will reduce the frequency and severity of patient assaults	The treatment on wards with SOTERIA elements lead to less aggressive assaults on staff and patients. The severity of incidents and the number of re-admissions decreased, although not statistically significant.