**Supplementary Material**

**Appendix A**

Database(s):  Search strategy via OVID
Search Strategy:

|  |  |  |
| --- | --- | --- |
| **#** | **Searches** | **Results** |
| 1 | \*"Runaway Behavior"/ | 717 |
| 2 | (abscond\* or absconsion).tw,id,kf. | 556 |
| 3 | (absen\* adj "from leave?").tw,id,kf. | 9 |
| 4 | (attempt\* adj escap\*).tw,id,kf. | 38 |
| 5 | ((authori\* or unauthori#ed or un-authori#ed) adj5 (absence\* or leav\*)).tw,id,kf. | 390 |
| 6 | (elopement? or eloper?).tw,id,kf. | 303 |
| 7 | (escap\* or leave or AWOL).ti. | 16163 |
| 8 | (escap\* adj3 (asylum\* or forensic\* or incidence or incident? or patient\* or risk\*)).tw,id,kf. | 882 |
| 9 | or/1-8 | 18731 |
| 10 | exp "Commitment (Psychiatric)"/ | 1838 |
| 11 | Criminal Responsibility/ | 917 |
| 12 | exp Forensic Evaluation/ | 3834 |
| 13 | Forensic Psychiatry/ | 13612 |
| 14 | Forensic Psychology/ | 4680 |
| 15 | Hospitalized Patients/ | 12830 |
| 16 | Insanity Defense/ | 2856 |
| 17 | Maximum/Medium/minimum Security Facilities/ | 267 |
| 18 | exp Mental Health Services/ | 135538 |
| 19 | Mentally Ill Offenders/ | 3684 |
| 20 | exp Psychiatric Hospitalization/ | 10241 |
| 21 | exp Psychiatric Hospitals/ | 34627 |
| 22 | Psychiatric Patients/ | 28575 |
| 23 | Psychiatric Units/ | 1819 |
| 24 | ("high security forensic psychiatric ward" or (lock\* adj ward?) or secure service?).tw,id. | 529 |
| 25 | forensic\*.mp,jn. | 98077 |
| 26 | ((insan\* adj2 acquit\*) or NCR or "not criminally responsible" or NGRI or "not guilty by reason of insanity").tw,id. | 3256 |
| 27 | (((high\* adj secur\*) or (mental\* adj (health or ill or illness\*)) or psychiatric\* or secure or security) and (facilit\* or hospital\* or institution\* or offender? or patient\* or unit? or service?)).ti. | 68262 |
| 28 | (((high\* adj secur\*) or (mental\* adj (health or ill or illness\*)) or psychiatric\* or secure or security) adj2 (facilit\* or hospital\* or institution\* or offender? or patient\* or unit? or service?)).tw,id. | 155706 |
| 29 | (or/10-28) use psyh | 158565 |
| 30 | 9 and 29 | 362 |
| 31 | "Commitment of Mentally Ill"/ | 6785 |
| 32 | Criminal Psychology/ | 3046 |
| 33 | exp Forensic Psychiatry/ | 43333 |
| 34 | Hospitals, Psychiatric/ | 25095 |
| 35 | Insanity Defense/ | 2856 |
| 36 | Mental Health Services/ | 67175 |
| 37 | Psychiatric Department, Hospital/ | 6705 |
| 38 | Psychiatric Nursing/ | 17382 |
| 39 | ("high security forensic psychiatric ward" or (lock\* adj ward?) or secure service?).tw,kf. | 537 |
| 40 | forensic\*.mp,jn. | 98077 |
| 41 | ((insan\* adj2 acquit\*) or NCR or "not criminally responsible" or NGRI or "not guilty by reason of insanity").tw,kf. | 3289 |
| 42 | (((high\* adj secur\*) or (mental\* adj (health or ill or illness\*)) or psychiatric\* or secure or security) and (facilit\* or hospital\* or institution\* or offender? or patient\* or unit? or service?)).ti. | 68262 |
| 43 | (((high\* adj secur\*) or (mental\* adj (health or ill or illness\*)) or psychiatric\* or secure or security) adj2 (facilit\* or hospital\* or institution\* or offender? or patient\* or unit? or service?)).tw,kf. | 159050 |
| 44 | (or/31-43) use ppez | 230062 |
| 45 | 9 and 44 | 359 |
| 46 | 30 or 45 | 721 |
| 47 | remove duplicates from 46 | 554 |

**Appendix B**

**Table for Quality Assessment of included studies based on design**

|  |  |  |
| --- | --- | --- |
| **Study** | **Year** |  **Study Quality Assessment Tools criteria** |
|  |  | **SD** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | **OR** |
| Morrow 24 | 1969 | CCS | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | No |  |  | **G** |
| Cooke et al.,14 | 1978 | CCS | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | No |  |  | **F** |
| Scott29 | 1980 | CCS | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | No |  |  |  | **G** |
| Bieber et al.,30 | 1988 | OCCSS | Yes | No | Yes | Yes | No | NA | NA | NA | NA | NA | No | No | No | No | **P** |
| Smith et al.,15 | 1990 | CCS | Yes | Yes | No | Yes | Yes | Yes | NA | Yes | Yes | Yes | No | No |  |  | **F** |
| Nicholson et al.,31 | 1990 | CCS | Yes | Yes | No | Yes | Yes | Yes | NA | Yes | Yes | Yes | No | No |  |  | **F** |
| Huws et al.,32 | 1993 | CCS | Yes | Yes | No | Yes | Yes | Yes | NA | Yes | Yes | Yes | No | No |  |  | **G** |
| Dolan et al.,33 | 1994 | CCS | Yes | Yes | No | Yes | Yes | Yes | NA | Yes | Yes | Yes | No | No |  |  | **G** |
| Nussbaum et al.,34 | 1994 | CCS | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | No |  |  | **F** |
| Quinsey et al.,35 | 1997 | CCS | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | No |  |  | **F** |
| Gacono et al.,36 | 1997 | CCS | Yes | Yes | No | Yes | NA | Yes | NA | NA | NA | Yes | No | No |  |  | **F** |
| Brook et al.,28 | 1999 | CCS | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes |  |  | **G** |
| Moore et al.,37 | 2000 | CCS | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes |  |  | **G** |
| Mahler et al.,38 | 2000 | CCS | Yes | Yes | No | Yes | Yes | Yes | NA | Yes | Yes | Yes | No | Yes |  |  | **G** |
| Beer et al.,39T | 2009 | CCS | Yes | Yes | No | Yes | Yes | Yes | NA | Yes | Yes | Yes | No | Yes |  |  | **G** |
| Hayward et al.,40 | 2010 | OCCSS | Yes | Yes | Yes | Yes | No | NA | Yes | NA | NA | NA | Yes | No | NA | No | **G** |
| Urheim et al.,21 | 2011 | OCCSS | Yes | Yes | Yes | Yes | No | NA | Yes | NA | NA | NA | Yes | No | NA | No | **G** |
| Andreasson et al.,41  | 2014 | OCCSS | Yes | No | Yes | Yes | No | NA | NA | NA | NA | NA | No | No | No | No | **P** |
| Scott et al.,42 | 2014 | OCCSS | Yes | Yes | Yes | Yes | No | NA | NA | NA | NA | NA | No | No | No | No | **F** |
| Wilkie et al.,43 | 2014 | CCS | Yes | Yes | No | Yes | Yes | Yes | NA | Yes | Yes | Yes | No | Yes |  |  | **G** |
| Cullen et al.,3 | 2015 | OCCSS | Yes | Yes | Yes | Yes | No | Yes | Yes | NA | NA | NA | Yes | No | NA | Yes | **G** |
| Simpson et al.,20 | 2015 | CIS | No | NA | NA | NA | NA | NA | Yes | Yes | Yes | NA | NA | No | No | No | **G** |
| Mezey et al.,44 | 2015 | OCCSS | Yes | Yes | Yes | Yes | No | Yes | Yes | NA | Yes | NA | Yes | No | NA | No | **F** |
| Tully et al.,45 | 2016 | CIS | Yes | Yes | Yes | Yes | No | Yes | Yes | NA | Yes | Yes | Yes | No | Yes | Yes | **G** |
| Martin et al.,46 | 2018 | CCS | Yes | Yes | No | Yes | Yes | Yes | NA | Yes | Yes | Yes | No | No |  |  | **G** |

1-14 are quality assessment items/criteria; CCS- case-controlled studies; CD- cannot determine; CIS- controlled intervention studies, NIH- National Institute of Health; NA- not applicable; NR-not reported; OCCSS- observational cohort and cross-sectional studies; OR-overall rating; SD-study design**.**

**Study Assessment criteria based on design**

1. ***Controlled interventional studies (CIS) tool***
2. Was the study described as randomized, a randomised trial, a randomized clinical trial, or as an RCT?
3. Was the method of randomization adequate (i.e. use of randomly generated assignment)?
4. Was the treatment allocation concealed (so that assignments could not be predicted)?
5. Were study participants and providers blinded to treatment group assignments?
6. Were the people assessing the outcomes blinded to the participants’ group assignments?
7. Were the groups similar at baseline on important characteristics that could affect outcomes (e.g. demographics, risk factors, co-morbid conditions)
8. Was the overall drop-out rate from the study at endpoint 20% or lower of the number allocated to treatment?
9. Was the differential drop-out rate (between treatment groups) at endpoint 15 percentage or lower?
10. Was there high adherence to the intervention protocols for each treatment groups?
11. Were other interventions avoided or similar in the groups (e.g. similar background treatments)?
12. Were outcomes assessed using valid and reliable measures, implemented consistently across all study participants?
13. Did the authors report that the sample size was sufficiently large to be able to detect a difference in the main outcome between groups with at least 80% power?
14. Were outcomes reported or subgroups analysed pre-specified (i.e. identified before analyses were conducted)?
15. Were all randomized participants analysed in the group to which they were originally assigned. i.e. did they use intention-to-treat analyses?
16. ***Observational Cohort and Cross- Sectional Studies (OCCSS) tool***
17. Were the research questions or objective in this paper clearly stated?
18. Was the study population clearly specified and defined?
19. Was the participation rate of eligible persons at least 50%?
20. Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prescribed and applied uniformly to all participants?
21. Was a sample size justification, power description, or variance and effect estimates provided?
22. For the analyses in this paper, were the exposure(s) of interest measured prior to the outcomes(s) being measured?
23. Was the timeframe sufficient so that one could reasonably expect to see an association between exposure and outcome if it existed?
24. For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome (e.g. categories of exposure, or exposure measured as continuous variable)?
25. Were the exposure measures (independently variables) clearly defined, valid, reliable, and implemented consistently across all study participants?
26. Was the exposure(s) assessed more than once over time?
27. Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?
28. Were the outcome assessors blinded to the exposure status of participants?
29. Was loss to follow up after baseline 20% or less?
30. Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcomes(s)?
31. ***Case-Control Studies (CCS) tool***
32. Was the research question or objective in this paper clearly stated and appropriate?
33. Was the study population clearly specified and defined?
34. Did the authors include a sample size justification?
35. Were controls selected or recruited from the same or similar population that gave rise to the cases (including the same time frame)?
36. Were definitions, inclusion and exclusion criteria, algorithms or processes used to identify or select cases and controls valid, reliable, and implemented consistently across all study participants?
37. Were cases clearly defined and differentiated from controls?
38. If less than 100 percent of eligible cases and/or controls were selected for the study, were the cases and/or controls randomly selected from those eligible?
39. Was there use of concurrent controls?
40. Were the investigators able to confirm that the exposure /risk occurred prior to the development of the condition or vent that defined a participant as a case?
41. Were the measures of exposure/risk clearly defined, valid, reliable, and implemented consistently (including the same time period) across all study participants?
42. Were the assessors of exposure/risk blinded to the case or control status of participants?
43. Were key potential confounding variables measured and adjusted statistically in the analyses? If matching was used, did the investigators account for matching during study analyses

**Overall Quality rating (Good, Fair or Poor)**

**List of Included Studies**

1. Morrow WR, Escapes of Psychiatric Offenders, 60 J. Crim. L. Criminology & Police Sci. 464 (1969)
2. Cooke, G., & Thorwarth, C. (1978). Prediction of Elopement of Mentally Ill Offenders Using the MMPI. Correctional Psychologist, 5(2), 151–157. https://doi.org/10.1177/009385487800500206
3. Scott NA. The applicability of the Beall-Panton MMPI escape index to female felons. J Clin Psychol. 1980 Jan;36(1):360-3.
4. Bieber SL, Pasewark RA, Bosten K, Steadman HJ. Predicting Criminal Recidivism of Insanity Acquittees. *International Journal of Law and Psychiatry, 1988; vol, 11:105-112*
5. Smith J., Quaynor E. (1990) Absconding from a regional secure unit, The Journal of Forensic Psychiatry, 1:2, 245-250, DOI: 10.1080/09585189008408474
6. Nicholson RA, Norwood S, Enyart C. Characteristics and outcomes of insanity acquittees in Oklahoma. Behav Sci Law. 1991 Fall;9(4):487-500. PubMed PMID: 10148823.
7. Huws R, Shubsachs A (1993) A study of absconding by special hospital patients: 1976 to 1988. The Journal of Forensic Psychiatry 4: 45–58.
8. Dolan M, Snowden P (1994) Escapes from a medium secure unit. Journal of Forensic Psychiatry 5:275–286.
9. Nussbaum, D., Lang, M., Chan, B. & Riviere, R. (1994). Characterization of elopers during remand: Can they be predicted? The METFORS experience. American Journal of Forensic Psychology 12, 17-37.
10. Quinsey, V. L., Coleman, G., Jones, B., & Altrows, I. F. (1997). Proximal antecedents of eloping and reoffending among supervised mentally disordered offenders. Journal of Interpersonal Violence, 12(6), 794-813
11. Gacono, C. B., Meloy, J. R., Speth, E. & Roske, A. (1997). Above the law: Escapes from a maximum-security forensic hospital and psychopathy. Journal of the American Academy of Psychiatry & the Law. 25, 547-550
12. Brook M, Dolan M, Coorey P (1999) Absconding of patients detained in an english special hospital. The Journal of Forensic Psychiatry 10: 46–58.
13. Moore E, Hammond S (2000) When statistical models fail: problems in the prediction of escape and absconding behaviour from high-security hospitals. The Journal of Forensic Psychiatry 11: 359–371.
14. Mahler, JohnPokorny, Dan Pfafflin, Friedemann (2000) How great is the danger for the general public caused by escapes of psychiatric patients from indefinite detention? Recht & Psychiatrie 18(1)pg 3-11(Not Available YET)
15. Beer MD, Muthukumaraswamy A, Khan AA, Musabbir MA (2009) Clinical predictors and patterns of absconding in a low secure challenging behaviour mental health unit. Journal of Psychiatric Intensive Care 5: 81–87.
16. Hayward D, White T, Kauye F. Review of the forensic psychiatry service at Zomba Mental Hospital and a comparison of forensic psychiatry services in Malawi and Scotland. Med Sci Law. 2010 Apr;50(2):67-71.
17. Ragnar Urheim, Knut Rypdal, Tom Palmstierna & Arnstein Mykletun (2011) Patient Autonomy versus Risk Management: A Case Study of Change in a High Security Forensic Psychiatric Ward, International Journal of Forensic Mental Health, 10:1, 41-51, DOI: 10.1080/14999013.2010.550983
18. Andreasson H, Nyman M, Krona H, Meyer L, Anckarsäter H, Nilsson T, Hofvander B. Predictors of length of stay in forensic psychiatry: the influence of perceived risk of violence. Int J Law Psychiatry. 2014 Nov-Dec;37(6):635-42. doi: 10.1016/j.ijlp.2014.02.038. Epub 2014 Mar 14
19. Scott R, Goel V, Neillie D, Stedman T, Meehan T. Unauthorised absences from leave from an Australian security hospital. Australas Psychiatry. 2014 Apr;22(2):170-3.
20. Wilkie T, Penney SR, Fernane S, Simpson AI. Characteristics and motivations of absconders from forensic mental health services: a case-control study. BMC Psychiatry. 2014 Mar 27; 14:91. doi: 10.1186/1471-244X-14-91.
21. Simpson AI, Penney SR, Fernane S, Wilkie T. The impact of structured decision making on absconding by forensic psychiatric patients: results from an A-B design study. BMC Psychiatry. 2015 May 3; 15:103. doi: 10.1186/s12888-015-0474-1
22. Cullen AE, Jewell A, Tully J, Coghlan S, Dean K, Fahy T. A Prospective Cohort Study of Absconsion Incidents in Forensic Psychiatric Settings: Can We Identify Those at High-Risk? PLoS One. 2015 Sep 24;10(9):e0138819. doi: 10.1371/journal.pone.0138819.
23. John Tully, Alexis E. Cullen, Dave Hearn & Thomas Fahy (2016) Service evaluation of electronic monitoring (GPS tracking) in a medium secure forensic psychiatry setting, The Journal of Forensic Psychiatry & Psychology, 27:2, 169-176, DOI: 10.1080/14789949.2015.1122823
24. Mezey G, Durkin C, Dodge L, White S. Never ever? Characteristics, outcomes and motivations of patients who abscond or escape: A 5-year review of escapes and absconds from two medium and low secure forensic units. Crim Behav Ment Health. 2015 Dec;25(5):440-50. doi: 10.1002/cbm.1982.
25. Krystle Martin, Matthew McGeown, Marjory Whitehouse & Wendy Stanyon (2018) Who’s going to leave? An examination of absconding events by forensic inpatients in a psychiatric hospital, The Journal of Forensic Psychiatry & Psychology, 29:5, 810-823