General hospital health professionals' attitudes and perceived dangerousness towards patients with co-morbid mental and physical health conditions: systematic review and meta-analysis.

Abstract

The stigmatisation of mental health is present in general hospital settings impacting quality of care. We hypothesised that health professionals in these areas would elicit negative attitudes and a perceived level of dangerousness across a range of mental health disorders. We aimed to conduct a systematic review and meta-analysis to examine these attitudes and perceptions. We searched the bibliographic databases of CINAHL Complete, MEDLINE Complete, PsycINFO and Psychology and Behavioral Sciences Collection in May 2017 (no date parameters were set). Quantitative studies investigating generalist health professionals' attitudes towards mental health conditions were selected. Initially prevalence meta-analyses were conducted to assess the extent of perceived danger, followed by a series of comparative meta-analyses in which the perceived dangerousness of mental health conditions were compared. Of the 653 citations retrieved, eight studies met the inclusion criteria. The overall sample included 2548 health professionals. A majority of health professionals perceived patients with substance use disorder as dangerous 0.60 (95% CI: 0.32 to 0.88) when compared with patients who had an alcohol-related disorder, schizophrenia and depression. The results also indicated that a large proportion of staff perceived patients with a diagnosis of schizophrenia as dangerous 0.42 (95% CI: 0.33 to 0.52). Negative attitudes towards people experiencing mental illness in general hospital settings may be attributed to poor mental health literacy, skills and limited exposure, and social and cultural beliefs about mental illness. Ongoing professional development targeting mental health knowledge is recommended for health professionals working in general hospital settings.

Key words: attitudes; dangerousness; depressive disorders; drugs of dependence disorders; health professional; schizophrenia; stigma and discrimination

Introduction

The poor physical health of people with mental illness, and the widening mortality and morbidity rates for people with mental illness compared to the general population is a global health burden (De Hert et al., 2011). Health professionals in general medical settings (e.g. emergency departments, medical surgical wards, general medical wards and intensive care units) find the complex care of patients with mental and physical health comorbidity challenging. Patients are often considered difficult or even dangerous (Zolnierek, 2009). A systematic review by Giandinoto and Edward (2014) examined this phenomenon, finding that the challenges were centred on the fear of aggression potential during the course of carrying out care for patients. Environmental factors such as a lack of privacy for sensitive discussions that created barriers to effective care were also noted. In particular, health professionals believed they did not possess adequate skills or adequate mental health literacy to address the needs that might arise for individuals in their care. Mental health literacy is defined as "knowledge and beliefs about mental health which aid their recognition, management or prevention" (Jorm, 2000, p.396).

An Australian study compared health professionals and the general public, exploring and comparing attitudes and stigma towards mental illness, and revealed that health professionals possess stigmatising attitudes comparable to the general public, in particular to the perception of dangerousness and personal stigma (Reavley et al., 2014). Pescosolido et al. (2010), found that while mental illnesses (including schizophrenia, alcohol dependence, and major depression) are now better understood in terms of their neurobiological causes, stigma related to danger and social distance remains relatively unchanged over time. These findings indicate that further stigma reduction strategies for both health professionals and the general public are warranted.

Healthcare professionals working in general medical settings report poor confidence in their mental healthcare skills and knowledge, resulting in uncertainty and a perception of dangerousness and/or increased risk for danger when caring for patients with mental illness (Giandinoto & Edward, 2015). They also report adverse attitudes and stereotypes which can have an impact on the quality of care people with mental and physical illness comorbidity receive in the general medical hospital setting. This has the potential to lead to poorer clinical outcomes for these patients (Mather et al., 2014). In light of this it is useful to understand stigma in the context of service provision, since it is clear that stigma is a fundamental cause of health disparities (Hatzenbuehler et al., 2013). People with severe mental illness may display behaviours that are perceived to violate behavioural norms: this can lead healthcare staff to perceive patients as dangerous. Staff may engage in avoidant behaviours in efforts to minimise perceived risk of danger whether it is real or not (Feldman & Crandall, 2007; Giandinoto & Edward, 2015).

The aim of this systematic review with meta-analyses was to examine the prevalence of negative attitudes and perceptions held by health professionals working in general medical hospitals towards people experiencing mental illness. We also aimed to identify if there were any differences in attitudes when comparing particular mental health disorders. By identifying potential triggers for mental health related stigmatising attitudes in general medical settings we can offer recommendations to inform educational content for professional development or policy initiatives in an attempt to decrease the disparity of care afforded to this patient group.

Methods

We conducted a systematic review with meta-analyses in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklists (Moher et al., 2009).

Inclusion and exclusion criteria

We included studies that met the following criteria: (a) peer-reviewed journal articles reporting systematic reviews and primary quantitative research studies written in English, and (b) articles addressing general care health professionals' attitudes and perceptions towards patients with mental health conditions. Date limits were not set. Articles excluded from the review were those that addressed (a) health settings other than general medical hospitals, (b) qualitative studies, (c) literature reviews, and (d) opinion pieces and expert commentaries (for example, editorials and letters to the editor).

Definitions

We identified the population as: any health professional working in acute medical hospital settings (i.e. non-mental health) e.g. nurses, medical, allied health, and health workers. The outcomes considered for the review were measures of the health professionals' attitudes and perceptions towards patients experiencing mental illness.

Search strategy

The bibliographic databases of CINAHL Complete, MEDLINE Complete, PsycINFO and Psychology and Behavioral Sciences Collection were searched initially in May 2016 and updated in May 2017. The search was conducted by entering a list of predetermined keywords (see Table 1). We screened the title and abstracts of returned articles and retrieved

the full text of relevant studies for further screening. A manual search of references from returned studies were included if appropriate.

Study selection

Each of the studies were independently inspected by two of the three reviewers (JG and KL) and any disputes were resolved through a consensus discussion with the third author (JS).

[Insert Table 1]

Data extraction and quality assessment

We extracted data according to a protocol designed for this review. We extracted relevant information related to: study information (date, author(s)), methodological factors (sampling, quantification of outcomes), demographic background and study setting. No studies were excluded for reasons related to methodological quality; however the limitations of each study were considered.

Statistical Analysis

Meta-analyses were conducted to assess the attitudes of health professionals towards patients with mental health conditions. Selected studies featured a wide range of mental health disorders. For the purposes of this analysis, the following mental health disorders were studied:

(i) General mental health / psychiatric conditions;

(ii) Schizophrenia

(iii) Depression

(iv) Substance use disorder - drugs

(v) Substance use disorder - alcohol

Attitudes towards people experiencing mental illness were measured in the selected studies using a wide range and number of mostly Likert-style attitude statements. Not all of these attitudes could be considered to be measuring the same underlying concept. However, many statements were considered to represent an assessment of the degree of danger posed by the patient to themselves, others or to property (listed in Table 2). Categorical outcomes measured using items with more than two options were dichotomised using appropriate combinations of options, with half-weightings being assigned to "neutral" or "uncertain" responses.

Initially prevalence (single proportion) meta-analyses were conducted to assess the extent of perceived danger amongst patients in each of the conditions considered separately. Studies included in these analyses considered at least one of the patient condition groups under investigation. This was followed by a series of comparative meta-analyses in which the perceived dangerousness of patients with different mental health conditions were compared. Studies were included in these analyses only if they considered both of the appropriate patient conditions under investigation.

Random effects analyses were conducted in all cases due to identified clinical and design heterogeneity. Identified heterogeneity included the variation in items used to measure attitudes as listed above, but also included economic / cultural backgrounds (some studies were conducted in high-income countries; some in low- and middle-income countries); and the educational and clinical backgrounds of participants (doctors, nurses, and other health workers were represented).

For all outcomes, the prevalence for the factor under consideration, with associated confidence intervals, was calculated and presented in a forest plot together with a synthesized estimate (and associated confidence intervals) calculated using Mantel-Haenszel weightings.

Funnel plots were considered for any meta-analysis involving eight or more studies, but were not constructed due to the limited number of studies included in each of the meta-analyses conducted.

For all meta-analyses, statistical heterogeneity was assessed using Cochran's Q statistic, which for a meta-analysis of *n* studies, approximately follows a χ^2 distribution on *n*-1 degrees of freedom. The corresponding I^2 statistic and the between-study variance of the intervention effect (τ^2) were also derived. A *Z*-test for overall effect was also conducted in all cases; however, it was expected for the prevalence studies that the proportions of participants identifying each risk factor would be significantly different to zero. All analyses were conducted using the Stata statistical software (Version 14) (StataCorp, 2015).

[Insert Table 2]

[Insert Figure 1]

Results

The electronic search identified 809 articles with 158 duplicates and a further two articles identified from manual reference searching, resulting in 653 potentially relevant articles. A total of eight studies were considered suitable for inclusion in a meta-analysis from 20 potentially relevant studies that were screened in full text (see Figure 1). The main reason for the studies being excluded was that the studies did not specifically measure health professionals' attitudes. A sample of 2548 health professionals working in general hospital settings was represented.

Prevalence meta-analyses

Mental Health Disorders (General)

The perception of patients with a mental health disorder as dangerous was identified by five studies. Outcomes in all included studies were categorical. A single-proportion random effects meta-analysis derived a synthesised estimate for the proportion of participants who perceived patients with this condition as dangerous risk factor of 0.53 (95% confidence interval [CI]: 0.33 to 0.74) (Figure 2). A *Z*-test for overall effect revealed strong evidence that this proportion was non-zero (Z=5.07, p<0.001). Individual estimates ranged for the proportion ranged from 0.24 (Arvaniti et al., 2009) to 0.71 (Adewuya & Oguntade, 2007). Cochran's Q test revealed strong evidence for statistical heterogeneity ($\chi^2_{(4)}$=338.3; p<0.001). The I^2 statistic was 98.82%, indicating substantial statistical heterogeneity. The τ^2 statistic (between-study variance) was calculated to be 0.05.

[Insert Figure 2]

Schizophrenia

Perception of patients with schizophrenia as dangerous was identified by three studies. Outcomes in all included studies were categorical. A single-proportion random effects meta- analysis conducted on this outcome derived a synthesised estimate for the proportion of participants who perceived patients with this disorder as dangerous of 0.42 (95% CI: 0.33 to 0.52) (Figure 3). A *Z*-test for overall effect revealed strong evidence that this proportion was non-zero (Z=8.95, p<0.001). Individual estimates ranged for the proportion ranged from 0.35 (Noblett et al., 2015) to 0.49 (Fernando et al., 2010). Cochran's Q test revealed evidence for statistical heterogeneity ($\chi^2_{(2)}$=7.87; p=0.02). The I^2 statistic was 74.6%, indicating substantial statistical heterogeneity. The τ^2 statistic (between-study variance) was calculated to be 0.00.

[Insert Figure 3]

Depression

No studies of depression were found which included items considered to relate to *dangerousness*. Hence a meta-analysis was not conducted on this outcome.

Substance use disorder - drugs

Perception of patients with substance use disorder - drugs as dangerous was identified by three studies. Outcomes in all included studies were categorical. A single-proportion random effects meta-analysis conducted on this outcome derived a synthesised estimate for the proportion of participants who perceived patients with this condition as dangerous of 0.60 (95% CI: 0.32 to 0.88) (Figure 4). A *Z*-test for overall effect revealed strong evidence that this proportion was non-zero (Z=4.20, p<0.001). Individual estimates ranged for the proportion ranged from 0.22 (Noblett et al., 2015) to 0.81(Fernando et al., 2010). Cochran's Q test revealed evidence for statistical heterogeneity ($\chi^2_{(2)}$=98.0; p<0.001). The I^2 statistic was 98.0%, indicating substantial statistical heterogeneity. The τ^2 statistic (between-study variance) was calculated to be 0.06.

[Insert Figure 4]

Substance use disorder - alcohol

Perception of patients with substance use disorder - alcohol as dangerous was identified by three studies. Outcomes in all included studies were categorical. A single-proportion random effects meta-analysis conducted on this outcome derived a synthesised estimate for the proportion of participants who perceived patients with this condition as dangerous of 0.46 (95% CI: 0.03 to 0.88) (Figure 5). A *Z*-test for overall effect revealed evidence that this proportion was non-zero (Z=2.12, p=0.03). Individual estimates ranged for the proportion

ranged from 0.10 (Noblett et al., 2015) to 0.71 (Fornaro et al., 2016). Cochran's Q test revealed evidence for statistical heterogeneity ($\chi^2_{(2)}$=249.8; p<0.001). The I^2 statistic was 99.2%, indicating substantial statistical heterogeneity. The τ^2 statistic (between-study variance) was calculated to be 0.14.

[Insert Figure 5]

Comparative studies

Three studies considered levels of perception of dangerousness in two or more types of patients; facilitating comparative analyses. Outcomes in all included studies were categorical.

Schizophrenia versus substance use disorder - drugs

A random effects meta-analysis conducted on three studies derived a synthesised estimate for the odds ratio for perceived dangerousness of patients with schizophrenia to patients with substance use disorder – drugs of 0.4 (95% CI: 0.15 to 1.06) (Figure 6). A Z-test for overall effect revealed insufficient evidence at the 5% significance level for an odds ratio of non- unity (Z=1.84, p=0.066). Individual estimates ranged for the odds ratio ranged from 0.21 (Björkman et al., 2008) to 1.76 (Noblett et al., 2015). Cochran's Q test revealed evidence for statistical heterogeneity ($\chi^2_{(2)}$=20 p<0.001). The I^2 statistic was 90.3%, indicating substantial statistical heterogeneity. The τ^2 statistic (between-study variance) was calculated to be 0.636.

[Insert Figure 6]

Schizophrenia versus substance use disorder - alcohol

A random effects meta-analysis conducted on three studies derived a synthesised estimate for the odds ratio for perceived dangerousness of patients with schizophrenia to patients with substance use disorder - alcohol of 0.85 (95% CI: 0.26 to 2.82) (Figure 7). A Z-test for overall effect revealed no evidence at the 5% significance level for an odds ratio of non-unity

(*Z*=0.26, *p*=0.796). Individual estimates ranged for the odds ratio ranged from 0.28 (Fernando et al., 2010) to 4.98 (Noblett et al., 2015). Cochran's Q test revealed evidence for statistical heterogeneity ($\chi^2_{(2)}$=31.3; *p*<0.001). The I^2 statistic was 93.6%, indicating substantial statistical heterogeneity. The τ^2 statistic (between-study variance) was calculated to be 0.998.

[Insert Figure 7]

Schizophrenia versus depression

A random effects meta-analysis conducted on three studies derived a synthesised estimate for the odds ratio for perceived dangerousness of patients with schizophrenia to patients with depression of 6.71 (95% CI: 1.59 to 28.3) (Figure 8). A *Z*-test for overall effect revealed strong evidence at the 5% significance level for a non-unity odds ratio (*Z*=2.59, *p*=0.009). Individual estimates ranged for the odds ratio ranged from 2.46 (Fernando et al., 2010) to 25.1 (Björkman et al., 2008) Cochran's Q test revealed evidence for statistical heterogeneity ($\chi^2_{(2)}$=16.3; *p*<0.001). The I^2 statistic was 87.8%, indicating substantial statistical heterogeneity. The τ^2 statistic (between-study variance) was calculated to be 1.385.

[Insert Figure 8]

Depression versus substance use disorder - drugs

A random effects meta-analysis conducted on three studies derived a synthesised estimate for the odds ratio for perceived dangerousness of patients with depression to patients with substance use disorder - drugs of 0.17 (95% CI: 0.04 to 0.69) (Figure 9). A *Z*-test for overall effect revealed evidence at the 5% significance level for a non-unity odds ratio (*Z*=2.47, *p*=0.014). Individual estimates ranged for the odds ratio ranged from 0.03 (Björkman et al., 2008) to 0.33 (Noblett et al., 2015). Cochran's Q test revealed evidence for statistical heterogeneity ($\chi^2_{(2)}$=19.5; *p*<0.001). The I^2 statistic was 89.7%, indicating substantial statistical heterogeneity. The τ^2 statistic (between-study variance) was calculated to be 1.384.

[Insert Figure 9]

Depression versus substance use disorder - alcohol

A random effects meta-analysis conducted on three studies derived a synthesised estimate for the odds ratio for perceived dangerousness of patients with depression to patients with substance use disorder - alcohol of 0.25 (95% CI: 0.07 to 0.94) (Figure 10). A *Z*-test for overall effect revealed evidence at the 5% significance level for a non-unity odds ratio (Z=2.05, p=0.040). Individual estimates ranged for the odds ratio ranged from 0.05 (Björkman et al., 2008) to 0.80 (Noblett et al., 2015). Cochran's Q test revealed evidence for statistical heterogeneity ($\chi^2_{(2)}$=14.3; p=0.001). The I^2 statistic was 86.1%, indicating substantial statistical heterogeneity. The τ^2 statistic (between-study variance) was calculated to be 1.157.

[Insert Figure 10]

Substance use disorder – drugs versus substance use disorder - alcohol

A random effects meta-analysis conducted on three studies derived a synthesised estimate for the odds ratio for perceived dangerousness of patients with substance use disorder – drugs to patient with substance use disorder – alcohol of 1.33 (95% CI: 0.93 to 1.91) (Figure 11). A *Z*-test for overall effect revealed insufficient evidence at the 5% significance level for an odds ratio of non-unity (Z=1.54, p=0.123). Individual estimates ranged for the odds ratio ranged from 1.05 (Fernando et al., 2010) to 2.40 (Noblett et al., 2015). Cochran's Q test revealed evidence for statistical heterogeneity ($\chi^2_{(2)}$=14.5; p=0.001). The I^2 statistic was 86.2%, indicating substantial statistical heterogeneity. The τ^2 statistic (between-study variance) was calculated to be 0.0713.

[Insert Figure 11]

Discussion

This systematic review with meta-analyses identified, through eight studies, that health professionals in general hospitals perceived patients with mental health disorders as dangerous. The health professionals' perceptions of mental health disorders (general), schizophrenia, substance use disorders and depression are not unlike those found amongst people in the general public.

Our results indicated that the greatest perceptions of dangerousness by healthcare staff were elicited by patients who had a substance use disorder - drugs. The synthesised estimate for the prevalence of healthcare professionals perceiving substance use disorder - drugs as a dangerous risk factor was 0.60 (95% CI for odds ratio 0.32 to 0.88) followed closely by alcohol-related co-morbidity 0.46 (95% CI for odds ratio 0.03 to 0.88). This synthesised estimate for the prevalence of healthcare professionals perceiving mental health disorders (general) as a dangerous risk factor was 0.53 (95% CI for prevalence 0.24 to 0.71). The synthesised estimate for the prevalence of healthcare professionals perceiving schizophrenia as a dangerous risk factor was 0.42 (95% CI for prevalence 0.35 to 0.49).

Views of mental illness differ significantly across cultures, for example in many cultures the attribution of mental illness is thought to be religious / spiritual in nature, and commonly in Western culture is attributed to criminality, such that people with mental illness are considered unpredictable, aggressive and dangerous (Abdullah & Brown, 2011; Mehraby, 2009) . A common thread in most cultures is that mental illness brings a certain level of stigma and shame for its sufferers, often impacting on people's help seeking behaviours and how they are cared for in the community (Mehraby, 2009). The studies included in this review investigating health professionals' attitudes in general hospitals were located in various geographical settings, including Nigeria, Africa (Adewuya & Oguntade, 2007;

Chikaodiri, 2009); Greece (Arvaniti et al., 2009); Sweden (Bjorkman et al., 2008); Sri Lanka (Fernando et al., 2010); South Africa (Mavundla & Uys, 1997); Malaysia (Minas et al., 2011) and United Kingdom (Noblett et al., 2015). Attitudes towards mental illness and the impact of culture were observed and discussed in a number of these studies. Adewyua and Oguntade (2007) reported that culturally enshrined beliefs regarding the cause for mental illness (e.g. evil spirits, alcohol and drug abuse) persisted and thus stigmatising attitudes amongst medical staff despite medical training and knowledge to the contrary were detected. Chikaodiri (2009) also surveyed health workers in Nigeria, where they reported that within Nigerian and many other African societies, mental illnesses are associated with deviant behaviours. As they revealed in their findings, this misunderstanding of mental health disorders is not immune in healthcare workers. Similarly, Bjorkman et al. (2008) in Sweden found that nurses held views in accordance with the general public; patients with drug and alcohol addictions and schizophrenia were considered most dangerous and blameworthy for their conditions compared to other mental health disorders.

When considering these different mental health disorders, overall the substance-use disorders were perceived by health staff as most dangerous when compared to schizophrenia and depression. Healthcare professionals are about 6.7 times more likely to consider patients with substance use disorder - drugs to be dangerous than they are to consider patients with depression dangerous (95% CI: 1.59 to 28.3 – a significant effect). Also healthcare professionals are about four times more likely to consider patients with substance abuse - alcohol to be dangerous than they are to consider patients with depression dangerous (95% CI: 2.06 to 14.3 – a significant effect). Moreover, there appeared to be no difference between perceived dangerousness of patients with schizophrenia and depression. Drug and alcohol problems are commonly seen in hospital presentations and are a key factor for hospital re-admissions (Smith et al., 2015). The prevalence of drug-related presentations is on the

increase, in particular amphetamine use (Roxburgh & Burns, 2013). Drug and alcohol misuse is a key factor of behavioural incidents in hospitals (e.g. aggression and violence) and it is not surprising health staff in these studies (Bjorkman et al., 2009; Fernando et al., 2010; Noblett et al., 2015) had a high perception of dangerousness for these patients (Morphet et al., 2014). Fernando et al. (2010) described medical staff describing drug and alcohol disorders as most dangerous as these patients are considered blameworthy in Sri Lankan culture. However, a diagnosis of schizophrenia was more tolerated, as the common attributed cause is witchcraft and as such patients are cared for by their families. In contrast the study conducted in the United Kingdom, Noblett et al. (2015) found that general medical doctors rated both patients with schizophrenia and substance use disorder – drugs with the least positive attitudes (e.g. considered them with suspicion, unpredictable and dangerous).

Furthermore, the participants of some of the studies in the review indicated that psychotic disorders such as schizophrenia were perceived as less dangerous than drug or alcohol related substance use disorders, such that the healthcare professionals are about 2.5 times more likely to consider patients with substance abuse (drugs) to be dangerous than they are to consider patients with schizophrenia to be dangerous (95% CI: 0.94 to 6.67 – a non-significant effect) and they are about 1.2 times more likely to consider patients with substance abuse (alcohol) to be dangerous that they are to consider patients with schizophrenia dangerous (95% CI: 0.44 to 3.85 – a non-significant effect) . However, nearly half of the health professionals indicated perceptions that they considered patients with a diagnosis of schizophrenia as dangerous. Of all the mental disorders, schizophrenia is associated with negative stereotyping (Wood et al., 2014) possibly due to bizarre and unpredictable presentations of positive symptoms (delusions and hallucinations) and poor mental health literacy of staff who may have limited exposure to this low prevalence mental disorder (Reavley et al., 2014).

Importantly, mental health consumers when in general health care settings describe feeling stigmatised; they report feeling ignored, treated as less competent and face suspicion from staff regarding their physical symptoms (Bjorkman et al., 2009). Healthcare staff who are in regular contact with people experiencing mental illness have important role in shaping attitudes about mental illness, our review, however for the majority revealed that medical and nursing staff hold negative attitudes towards people with mental illness. Minas et al. (2011) revealed that nurses when compared to doctors reported higher general stigma towards patients with mental illness and are more likely to avoid them. Healthcare staff who reported feeling unprepared/lack of training to care for patients with mental illness and less exposure to mental illness (both personally and professionally) reported more negative attitudes (Arvaniti et al., 2009; Adewuya & Oguntade, 2009; Bjorkman et al, 2009). Mitigating factors for negative attitudes were considered in some studies, where healthcare professionals with higher education levels, improved mental health literacy and familiarity of mental illnesses reported more positive attitudes (Arvaniti et al., 2009 Mavundla & Uys, 1997; Noblett et al. 2015).

Limitations

The main limitation of our study was the substantial statistical heterogeneity observed in all meta-analyses undertaken in this review. This indicates potential clinical variation in the way outcomes were examined, having an impact on the effects identified in the studies. However, the statistical heterogeneity was addressed with the construction of random-effects models.

Conclusions

Negative attitudes, in regards to the perception of dangerousness held by non-mental health professionals towards people with mental illness can be variable, person-dependant and impacted upon by cultural beliefs to a degree. While this review revealed the prevalence of

healthcare professionals' attitudes of dangerousness towards patients with mental illness in general medical hospitals, the authors of these studies suggest some possible causes for the existence of these attitudes. Negative attitudes were due to: poor mental health literacy, poor confidence in mental health skills, having limited exposure to people with mental illness and social or cultural beliefs about mental illness. The findings indicate that the type of mental disorder and context of the person's other lifestyle factors, such as alcohol and illicit substance use were a consideration for staff. For example, people with substance use disorders and psychotic disorders were considered more likely to be a risk of unpredictable and potentially dangerous behaviours. While there appeared to be a difference in level of education in nursing staff with regards to attitudes towards people with mental illness (i.e. more educated nurses held more positive attitudes) a mixed return of evidence existed for medical staff.

Relevance to clinical practice

It was evident from the findings of the review more rigorous research is required to identify mental health literacy needs of non-mental health staff. Improvement in mental health literacy amongst non-mental health staff appears a key area for further development in an effort to reduce negative attitudes of staff towards patients with mental illness. Areas for consideration in improving mental health literacy in non-mental health clinicians include: risk appraisal, management of challenging behaviours, de-escalation skills building and exploration of cultural factors including dispelling unfounded beliefs that may guide attitudes. Mental healthcare staff are well placed in mainstreamed health services to provide such ongoing professional development for these staff.

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Table 1. Search terms and search strategy

S1 "mental illness*" OR "psychiatric illness*" OR "mental health" OR "mental disorder*" OR "mental health condition*" OR "psychiatric disorder*" OR "psychiatric condition*" OR "mental health diagnosis" OR "psychiatric diagnosis
S2 "physical illness*" OR somatic OR "chronic health" OR illness* OR "physical disabilit*" OR somatoform
S3 "general hospital*" OR "acute medical setting*" OR ward* OR "medical surgical*" OR "intensive care" OR "emergency department"
S4 "healthcare professional*" OR "health care professional" OR "medical personnel" OR nurse* OR doctor* OR "health personnel" OR personnel OR "health care worker*" OR "healthcare worker*" OR "health staff"
S5 treatment OR attitude* OR experience* OR perception*.
S6 S1 AND S2 AND S3 AND S4 AND S5

Table 2. Summary of parameters of included studies

Trial reference	Sampling strategy (n)	Trial setting	Participant characteristics	Participants surveyed and response rate	Mental health condition(s)	Quantification of outcome	Limitations
Adewuya & Oguntade 2007	(n=312) Random sampling	Eight selected Nigerian health institutions	Medical doctors	312 / 350 (89·1%)	General mental health	Proportion of respondents perceiving patients with mental illness as "dangerous"	Focus was on general mental illness not specific types. Cultural limitations affecting generalisability.
Arvaniti *et al*. 2009	(n=600) Random sampling	University General Hospital, Alexandroupolis, Greece	Randomly selected hospital employees and students	600 / 780 (76·9%)	General mental health	Proportion of respondents disagreeing with the statement: "Most individuals in psychiatric hospitals are not dangerous"	Sample was not representative of the participating site's staff due to not being stratified. Comparisons were also made between studies using different methodologies.
Björkman *et al*. 2008	(n=120) Convenience sampling	A University Hospital, Sweden	Registered and assistant somatic care and psychiatric care nurses	120 / 150 (80·0%)	Depression, panic attacks, schizophrenia, dementia, eating disorder, substance use disorder – alcohol and drugs	Proportion of respondents perceiving patients with given condition as a "danger to others"	Modest correlations found
Chikaodiri 2009	(n=362) Random sampling	Amino Kanu Teaching Hospital, Nigeria	Randomly selected hospital staff	362 valid responses received (response rate not	Psychiatry	Proportion of respondents disagreeing with the statement that psychiatric patients are "not a	Study was descriptive and cross sectional also cultural limitations may exist affecting generalisability.

				known)		danger to other patients"	
Fernando *et al.* 2010	(n=646) Convenience sampling	Teaching hospital, Columbo, Sri Lanka	Medical students and doctors	646 / 1263 (51·1%)	Depression, substance use disorder – alcohol and drugs, schizophrenia, dementia, panic disorder	Proportion of respondents perceiving patients with given condition as a "danger to others"	The majority of participants had limited medical experience affecting generalisability.
Mavundla &Uys 1997	(n=100) Probability sampling	Academic hospital in Durban, South Africa	100 nurses	100 / 100 (100·0%)	General mental health	Proportion of respondents agreeing with the statement that "most mentally ill people are dangerous"	Tool developed for the study and no reliability testing was performed.
Minas *et al.*2011	(n=356) Random sampling	Large university general hospital in Malaysia	General hospital health professionals	356 / 654 (54·4%)	General mental health	Proportion of respondents agreeing with the statement that "although some mental patients seem all right, it is dangerous to forget for a moment that they are mentally ill"	The use of brief written vignettes used in the study introducing social desirability bias.
Noblett *et al.* 2015	(n=52) Convenience sampling	Three General Hospitals in London, UK	Year 1, Year 2 and core trainee doctors working in general medical and surgical wards	52 participants' (response rate not known)	Substance use disorder – alcohol and drugs, depression, schizophrenia, personality disorder	Proportion of respondents perceiving patients with given condition as a "danger to others"	Small sample size and potential social desirability bias using vignettes in the study.

Figure 1. Flowchart of article selection process

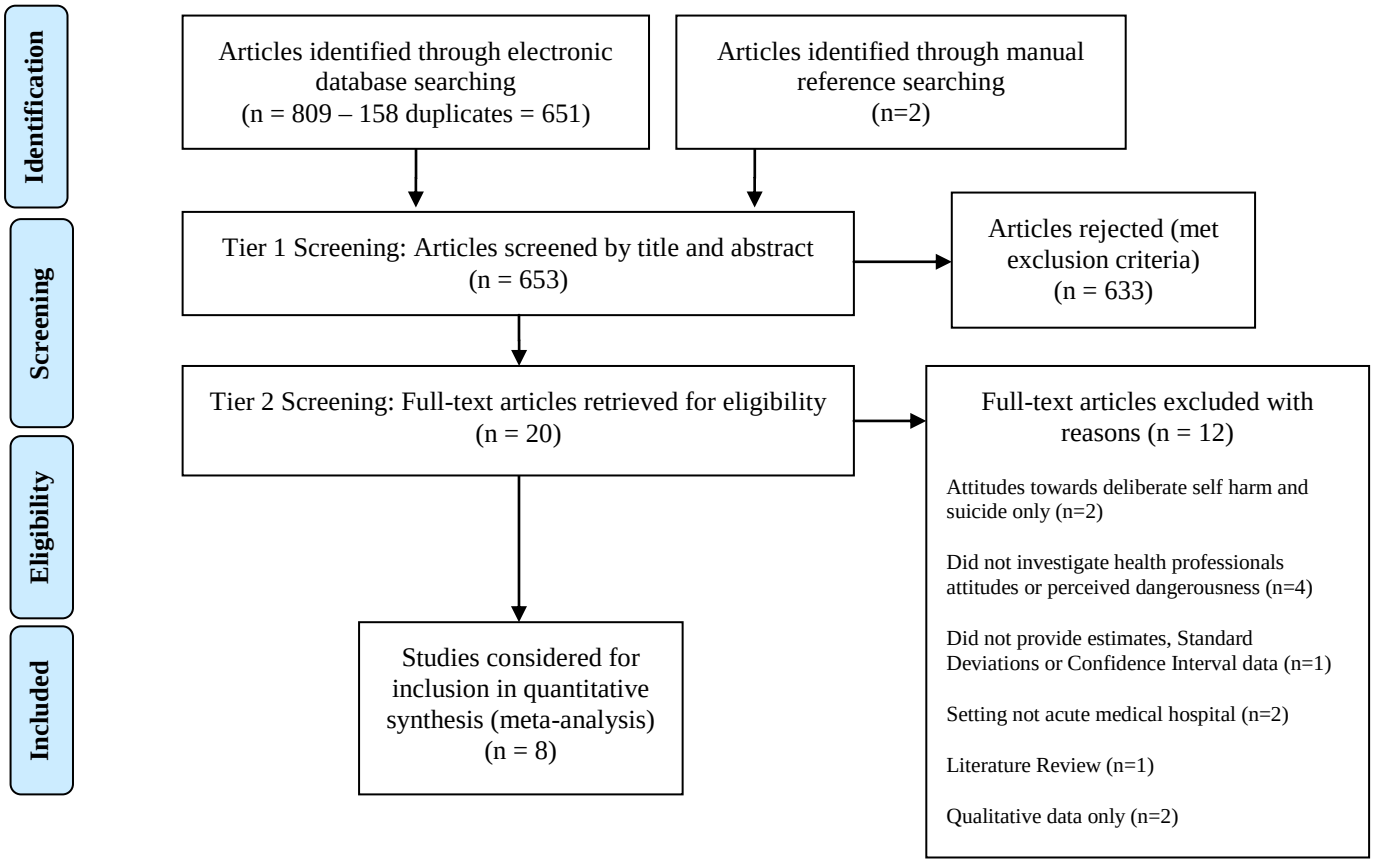

Figure 2. Forest plot for perceptions by staff of individuals with general mental health issues or to be perceived as dangerous to themselves, to others or to property

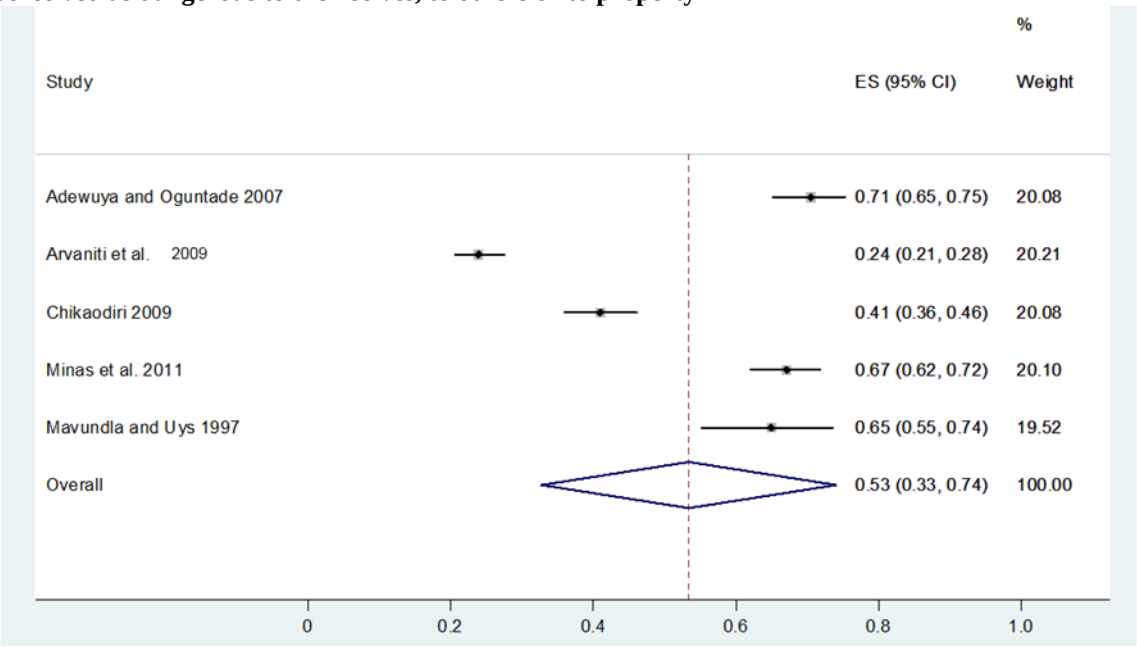

Figure 3. Forest plot for perceptions by staff of individuals with schizophrenia to be dangerous to themselves, to others or to property

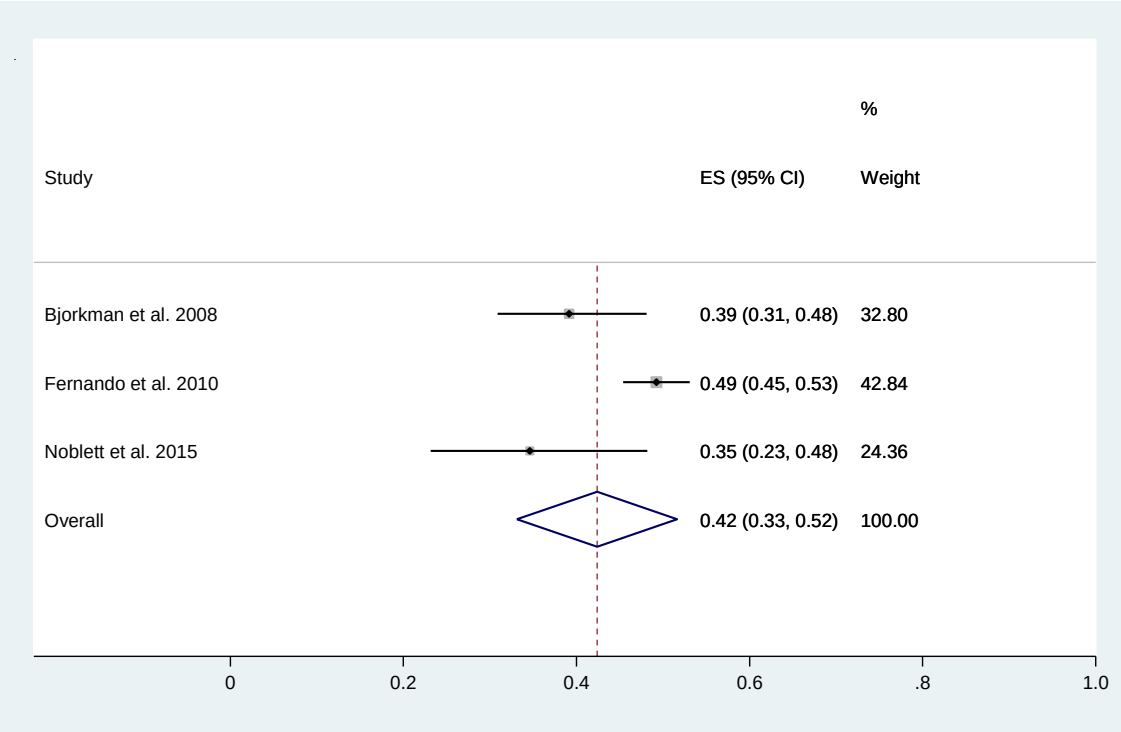

Figure 4. Forest plot for perceptions by staff of individuals with substance use disorder - drugs to be dangerous to themselves, to others or to property

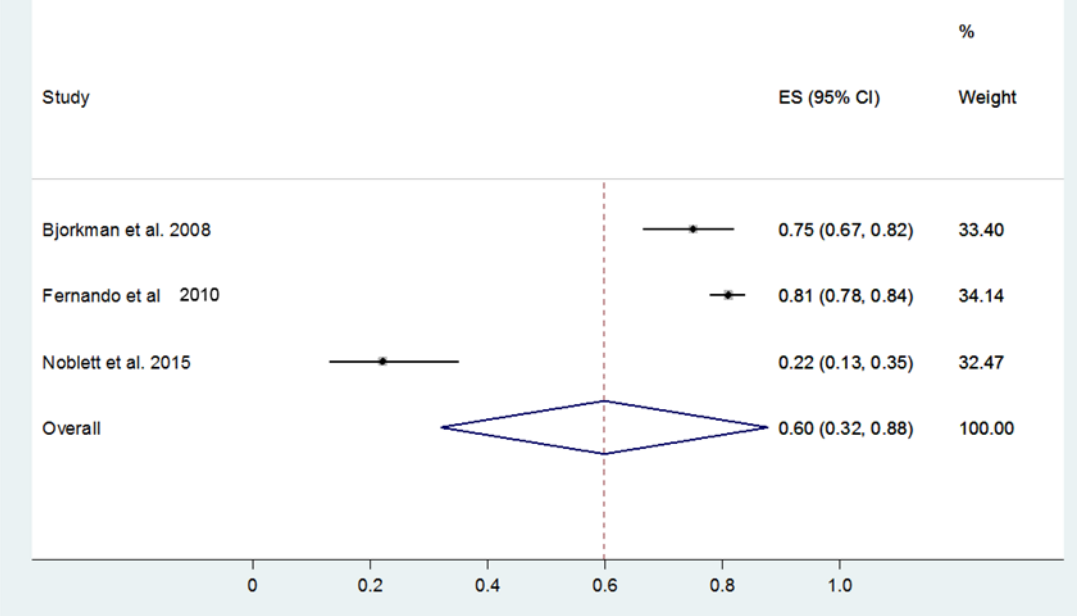

Figure 5. Forest plot for perceptions by staff of individuals with substance use disorder - alcohol to be dangerous to themselves, to others or to property

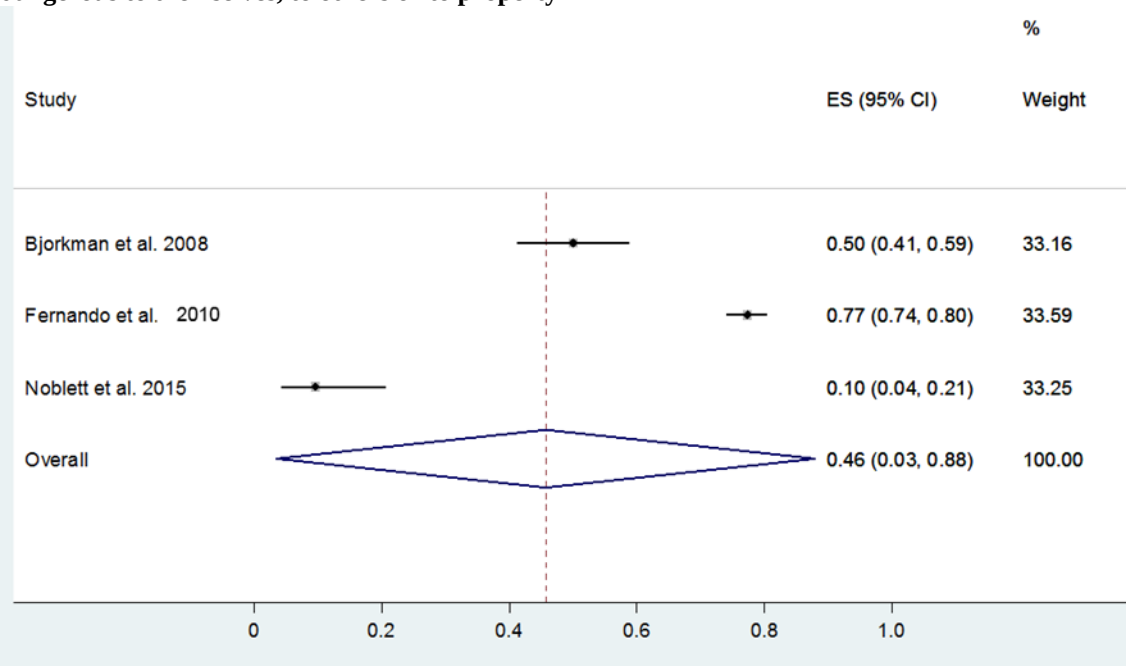

Figure 6. Forest plot for comparison of perceived dangerousness by staff towards individuals with schizophrenia and with substance use disorder - drugs

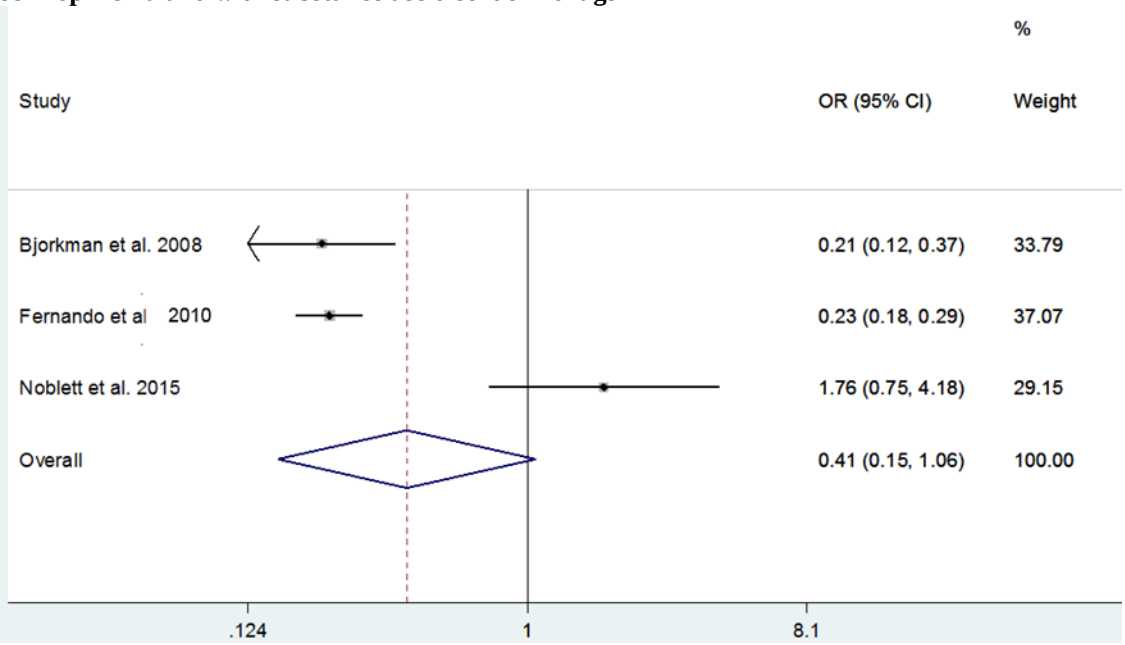

Figure 7. Forest plot for comparison of perceived dangerousness by staff towards individuals with schizophrenia and with substance use disorder - alcohol

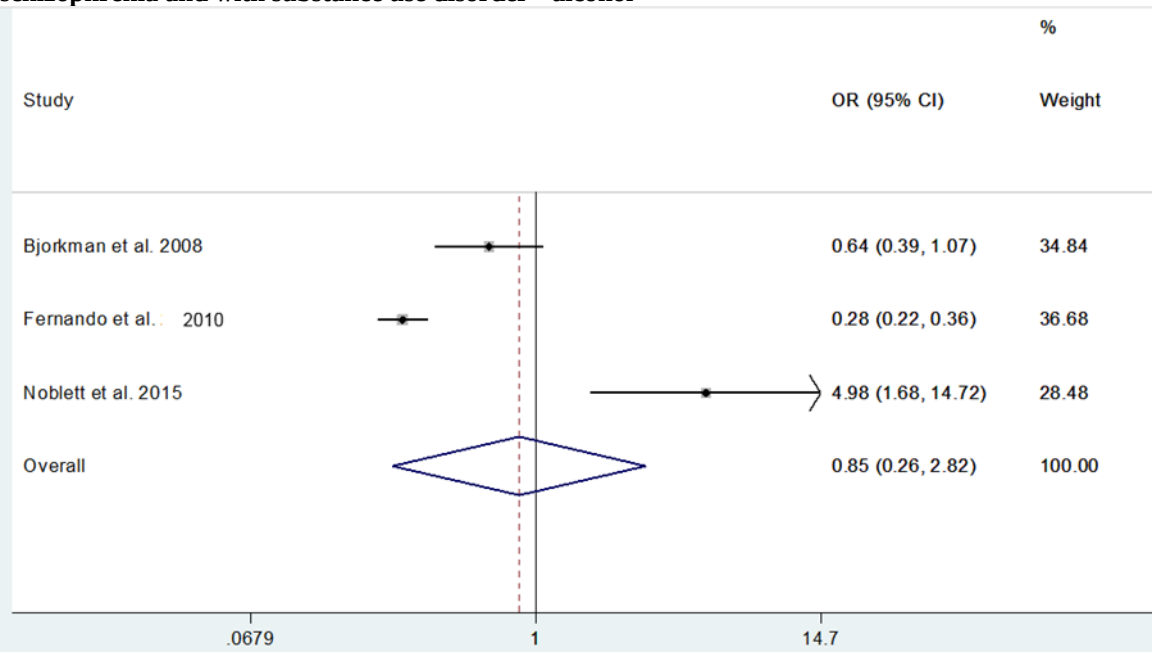

Figure 8. Forest plot for comparison of perceived dangerousness by staff towards individuals with schizophrenia and with depression

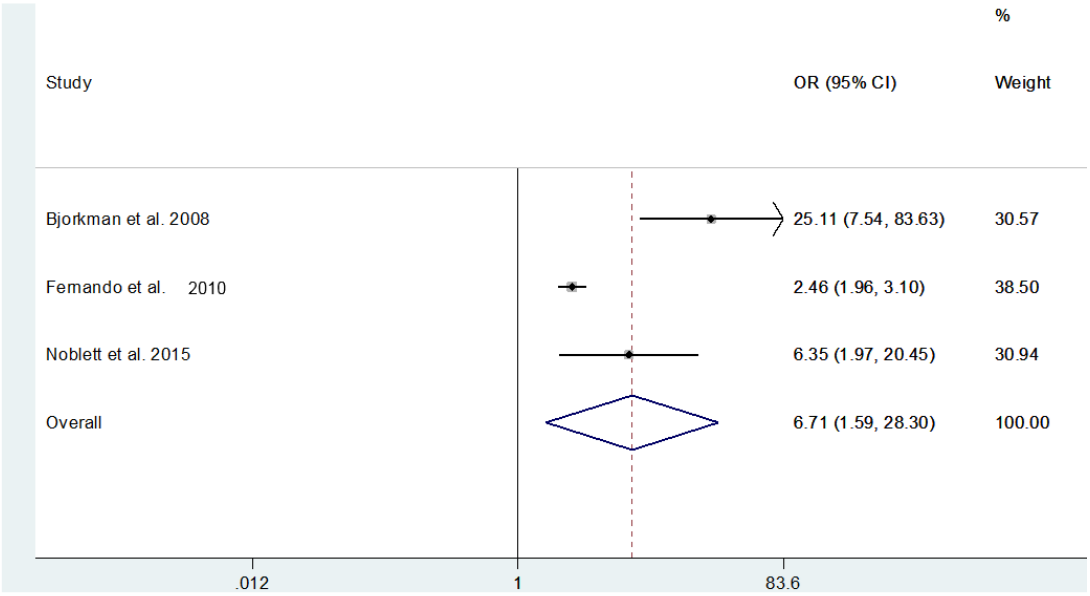

Figure 9. Forest plot for comparison of perceived dangerousness by staff towards individuals with depression and with substance use disorder - drugs

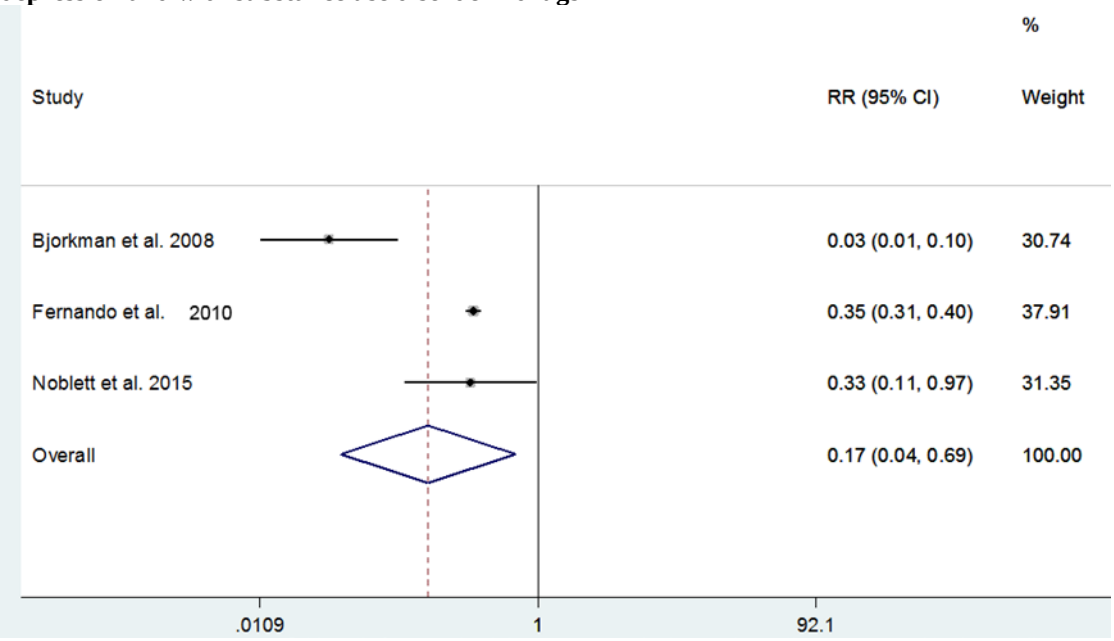

Figure 10. Forest plot for comparison of perceived dangerousness by staff towards individuals with depression and with substance use disorder - alcohol

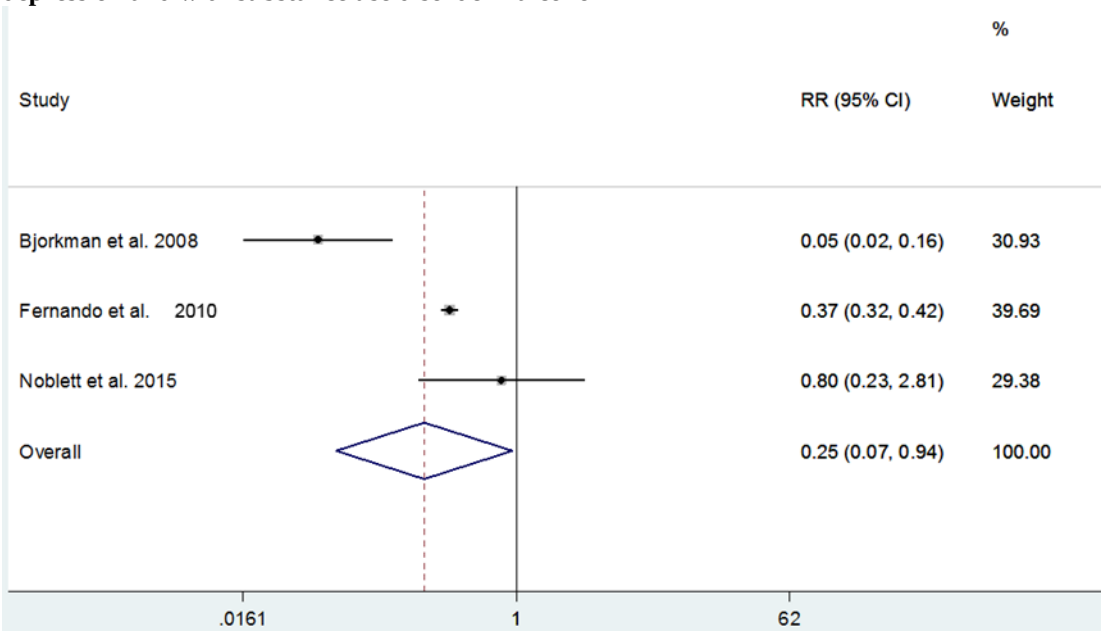

Figure 11. Forest plot for comparison of perceived dangerousness by staff towards people with substance use disorder – drugs and with substance use disorder – alcohol