

The interface of physical and mental health

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Abstract

Purpose The interaction between physical and mental health is complex. In this paper we aim to provide an overview of the main components of this relationship and to identify how care could be improved for people with comorbidities.

Methods We performed a literature search of MedLine, Ovid and Psycinfo and identified studies that examined the association between mental illness and physical illness. We also examined the key policy documents and guidelines in this area.

Results People with mental health conditions are at higher risk of developing physical illness, have those conditions diagnosed later and have much higher mortality rates. Conversely, people with a diagnosis of physical illness, especially cardiovascular disease, diabetes and cancer have a greater chance of developing a mental health problem. When both mental and physical illnesses conditions are present together, there are higher overall rates of morbidity, healthcare utilisation, and poorer quality of life.

Conclusions Physicians and psychiatrists need to be aware of the co-occurrence of mental and physical health problems and the challenges posed for both general and mental health services. There is a need to screen appropriately in both settings to ensure timely diagnosis and treatment. Liaison psychiatry provides psychological assessment and treatment for people with physical illness,

but there is a gap in the provision of physical healthcare for people with severe mental illness. There is a need for public policy to drive this forward to overcome the institutional barriers to equitable access to healthcare and for educators to reverse the tendency to teach mind and body as separate systems.

Keywords Psychiatry · Medicine · Co-morbidity · Depression · Psychosis

Introduction

The mind and the body have long been seen as separate when planning health services. In recent years, this position is softening, largely due to the emergence of the sub-speciality of liaison psychiatry in the past 20 years and the more recent development of integrated models of integrated and collaborative care to address both mental and physical health problems. Having both a physical and a mental health condition, however, still results in more complicated treatments and poorer outcomes than having either problem alone.

Mental health problems are common: as many as one in four individuals experience a mental health problem during their lifetimes. Mental health and neurological problems account for 22 and 17 % of the total burden of disease burden, respectively, in men and women in the WHO European region, second only to cardiovascular disease [1]. Therefore at least by chance many people with a physical illness also have a mental health problem.

But this is not an effect of chance alone: prevalence rates of common mental disorders such as depression are even higher in people suffering physical ill health [2], especially for certain long-term conditions including

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diabetes, chronic obstructive pulmonary disease (COPD), and cardiovascular disease [3–6]. It is clear that the presence of a psychiatric co-morbidity in these conditions increases disease burden further with not just a cumulative effect on loss of function, but also increasing utilisation of healthcare resources [7, 8]. The presence of depression in addition to a physical condition increases the rates of death from any cause [9–12], particularly in older adults [13].

Reciprocally, a growing body of evidence indicates that people with enduring mental health problems have a greatly additional risk of developing physical health problems. The figures for premature mortality in people with severe mental illness are quite startling, with a diagnosis of schizophrenia conferring a two decade drop in life expectancy [14], while rates of metabolic syndrome run at approximately 32 % [15].

Mental health problems complicate strategies for the prevention and management of medical illnesses [16]. However, effective treatment of conditions such as depression has a positive effect on physical functioning and reduces morbidity and mortality [17, 18]. Likewise, the presence of a medical co-morbidity makes it more complicated to treat a mental illness, limiting both pharmacological and psychosocial options.

In this paper we aim to provide an overview of the complex relationship between mental and physical health and to identify how care could be improved for people with these co-morbidities.

Methods

As the interface between mental and physical health is a broad topic, we chose two specific conditions in each area: depression and psychosis for mental health and diabetes and cardiovascular disease for physical health. We selected these conditions based on their prevalence and on the significant clinical effect on health and on mortality. We conducted a search of the literature in MedLine, Ovid and Psycinfo using the search terms: ‘depression’, ‘psychosis’ with ‘physical health’; and ‘cardiovascular disease’ and ‘diabetes’ with ‘mental health’. We excluded those papers not written in English and selected those papers which were either epidemiological studies or systematic reviews or meta-analyses and then proceeded to examine the references of these articles. We also identified the key policy documents in these areas.

Results

Our literature search yielded 323 articles, from which we identified 92 suitable for inclusion; 54 were not in English and the remainder did not meet our criteria for study type.

It was not possible to conduct a meta-analysis as the scope of this article was too broad.

Physical illness in severe mental illness (SMI)

People living with mental illnesses such as depression, bipolar disorder, schizophrenia and even anxiety disorders have worse levels of physical health, in particular cardiovascular disease, and a shorter life expectancy than the general population [19–22]. To develop physical morbidity on top of a mental health problem, especially if it results in additional fatigue, sensory disability or mobility impairment, may make it even more challenging for people to participate in education, training or employment, or in looking after their families, thus adding to social isolation. In a circular fashion, the indirect effects of physical morbidity may adversely affect mental health, further magnifying physical disability.

Many factors may contribute to health inequalities in SMI including social factors (poverty and social exclusion), genetics, lifestyle choices, treatment effects, and, importantly, practical difficulties in access to care and health promotion [23].

Psychotic illness

The life-time prevalence of psychotic disorders has been estimated as 3 % [24]. The impact of a diagnosis of psychosis on one’s physical health has recently been the subject of research—people with a diagnosis of schizophrenia may die up to 18 years earlier than the general population [19, 25]. Over 60 % of this excess mortality is due to poor physical health, with cardiovascular disease the most common cause of death. In addition to a severely shortened life expectancy, the quality of life of people with severe mental illness is often also impaired by poor physical health. People with psychotic illness are more likely to be overweight, to smoke and to have cardiovascular risk factors including diabetes, hypertension and dyslipidaemia [26]. Adding to the morbidity burden are poor oral health, increased risks of osteoporosis and sexual dysfunction [27].

Inequity is evident: people with schizophrenia have not benefited from the increased general longevity across the developed world, and the gap in mortality rates compared to the general population has risen steadily over the last half-decade. For example in Sweden, despite provision of high quality health care systems, the risk of mortality from cardiovascular disease for men with SMI increased almost fivefold and for women almost threefold in 20 years [28].

The mortality risk is even more pronounced in the younger age groups; a large community-based English study of people with SMI reported elevated mortality risks from cardiovascular disease for those aged 18–49 and

50–75 years of 300 and 200 %, respectively [29]. These findings have been replicated in other studies, and persist even when confounding factors, for example smoking and socio-economic deprivation, are controlled for [30, 31]. People with psychotic illness carry an overall increased risk of cardiac death twice that of the general population [21, 32].

This excess risk has some obvious—and reversible—causes; risk factors such as insulin resistance, abdominal obesity, hypertension and lipid dysregulation, previously clustered under the term ‘metabolic syndrome’ [33], are much more common in SMI [34]. Critically, about two-thirds of people with SMI smoke [34, 35], while general population smoking rates have now dropped below 20 % [36]. Smoking is the greatest predictor of early death in schizophrenia—a recent 11-year follow-up study of mortality in schizophrenia in the USA found an SMR of 2.80 (95 %CI 0.89, 6.38) overall but that those participants who smoked cigarettes at baseline were almost five times more likely than the non-smokers to die of natural causes during the observation period [37]. Reducing smoking rates and addressing the causes and preventing its onset of metabolic syndrome could thus reduce the rates of diabetes and cardiovascular diseases in SMI. Incorporating lifestyle interventions as part of routine management will also improve health outcomes, with a NNT of 3–4 [38].

Depression

The World Health Organisation (WHO) ranks depression as one of the most significant challenges of the 21st century, because of its effect on disability and loss of function; it is the third leading cause of burden of disease worldwide, as measured by disease adjusted life years (DALY) [1]. It already carries the heaviest disease burden in the Americas, and is projected to be the top worldwide by 2030. Lifetime prevalence rates from major epidemiological studies are as high as 18–30 % [39–41]. But this common mental disorder also has a marked effect on general health and longevity. People with depression have almost double the risk of dying compared to the general population [42, 43]. This excess mortality risk is similar to that seen in smokers compared to the non-smokers [44].

Affective disorders are a cardiovascular risk factor in their own right with an increased risk of a cardiovascular event of up to 150 % compared to the general population, again comparable to the excess risk conferred by smoking or diabetes [45, 46]. People with depression are also 60 % more likely to develop diabetes than their non-depressed counterparts [47]. A systematic review of all English language articles over a 38-year period reported that the prevalence of diabetes in people with bipolar disorders was up to three times greater than in the general population

[34]. People with major depression have a significantly greater risk of arthritis, hypertension and peptic ulcer disease compared to the general population [47].

Despite many frontline clinicians being familiar with depression, mood can also impede early diagnosis of medical problems; Desai et al. [48] suggested an association between depression and increased chance of an advanced rather than early cancer diagnosis, with repercussions for prognosis. Although the incidence of cancer in both depression and psychosis is similar to the general population, the mortality rate is over 30 % higher [12, 49].

Pharmacological treatment and medical management

Pharmacological therapies are an important element of treatment received by people with mental health problems. The effectiveness of such therapies and their side effect profiles continue to improve. However, the frequency and severity of side effects needs to be actively managed, jointly with the patient and their families. Many psychotropic medications, including anti-depressants and anti-psychotics, produce adverse effects as sexual dysfunction and weight gain [50]. In the case of refractory psychoses, the most effective drug, clozapine has a very high rate of metabolic side effects [51–54]—however, a large population wide study of mortality in Finland demonstrated that of the people with schizophrenia, those on clozapine lived longest (with especially strong reductions in suicide rates), consistent with clinical observations that effective treatment of mental illness improves one’s ability to manage both physical and mental health [19].

In recent years the effectiveness of psychosocial interventions has been confirmed in either delaying the emergence of or reversing cardiovascular risk factors in people treated with anti-psychotics [38, 55]. A number of pharmacological strategies have also been trialled, including the use of metformin to effect weight loss on anti-psychotics [56], and the addition of aripiprazole to clozapine to promote metabolic health, as it reduces weight and improves lipid profiles [57].

Psychological problems in physical illness

The importance of identifying and managing mental health problems in those with physical health conditions is well established and the cost-effectiveness of liaison psychiatry services confirmed [58]. Many textbooks have been written on consultation and liaison psychiatry and we will only give some examples of its application here. Depression, in particular, is common in patients who have poor physical health, particularly when they have experienced a recent major diagnosis or life-threatening event [59].

The diagnosis of major depression in people with chronic ill-health may however be complex, as frequently the somatic symptoms of depression are masked by symptoms attributable to the physical condition [60, 61]. For example, in diabetes, somatic symptoms of anergia and insomnia may be attributed to a rumbling hyperglycaemia. And indeed many general and specialist physicians may have a reluctance to broach the topic of mood, particularly where the service does not have adequate liaison psychiatry expertise available [62–65]. Additionally, when a person presents with many complex physical conditions, there simply may not be time, especially in a 10-minute general practice consultation to consider mental health in addition to physical health [66–68].

However, exploring and evaluating mood is important—the treatment of depression in people with physical health problems can improve life expectancy. One controlled study in New York found a significant decrease of about a third in the risk of death, nearly all of which could be attributed to a reduction of deaths in cancer patients, by implementing an initiative to treat depression in older people in primary care settings [17]. Similarly, treatment of depression is linked to significantly lower 5-year mortality in older people with diabetes in the US [69].

The relationship of anxiety with mortality is less conclusive: some studies have shown a protective effect of anxiety [70], but others found an association between elevated anxiety levels and mortality [71].

Cardiovascular disease

Depression is a silent epidemic in this group [72]. Patients with heart disease are likely to have a similar rate of undiagnosed mental health problems as the general population. Several studies have provided evidence that depression itself is a risk factor for coronary artery disease, conferring a similar additional risk to that provided by smoking [73].

Depression has a particularly high prevalence in patients following myocardial infarction (MI) and appears to affect outcome [73]. In the ENRICHD study, 39 % of patients with MI met the diagnostic criteria for depression, and those patients with MI and depression had less favourable outcomes in terms of morbidity and survival [74]. The large ENRICHD trial also explored treatment effects [74]; there was no benefit in event-free-survival for the psychotherapy group although symptoms improved. However, survival rates improved in those MI patients on serotonin re-uptake inhibitory drugs (with or without psychotherapy).

Diabetes

Depression is a common problem in diabetes with a prevalence of around 10 % [75]. It is associated with poor

prognostic factors including sub-optimal concordance with medications [76], physical inactivity [77], and resultant poor glycaemic control [78], more diabetes complications and disability, poorer quality of life [76] and, ultimately, both directly and indirectly increased economic and societal costs [79, 80]. These factors also carry an increased mortality risk [81], most marked in young people with type 1 diabetes, partly attributed to psychological distress during transition into adult diabetes [82]. When people experience diabetes-related psychological distress this frequently impacts on their confidence to adequately self-care, necessitating greater support.

Diabetes is also associated with a range of other mental health problems including anxiety disorders [83], eating disorders [84], psychosis [85], and cognitive impairment [86]. When diabetes and eating disorder are co-morbid, the mortality rate increases to seven-times that of the general population and carries a threefold increased mortality rate compared to patients with only one of those conditions [87]. Across all mental health diagnoses, the presence of a psychiatric co-morbidity increases healthcare utilisation, the risk of long-term complications and overall cost-burden [88].

When diabetes care is integrated with mental health care, biomedical as well as psychosocial outcomes improve [89], and this is a practice which is gaining increased recognition in recent years. The guidelines of the National Institute for Clinical Excellence (NICE) in the UK therefore recommend screening for depression in diabetes [90].

Common origins—shared solutions?

A range of factors may contribute to the higher rates of morbidity and mortality seen in people with co-morbid mental and physical health problems. Poverty, homelessness, substance use, and smoking all confer an increased risk of both physical health problems, such as diabetes, obesity, cardiovascular disease and infectious diseases, and mental illness. Many of these are avoidable, including modifiable risk factors for cardiovascular disease [91, 92] and high smoking rates.

Reducing risks for poor health requires a multi-faceted approach to promotion of mental and physical well-being, reducing the risk of emergent co-morbid conditions as well as active management of existing risk factors. Service users themselves are aware of this: one 11-country survey of people with SMI highlighted measures to better treat depression and reduce weight gain as the most important ways to improve quality of life [93]. Service planners are listening: innovative stop smoking programmes are being rolled out across the UK, starting in forensic services, while the Lester Cardio metabolic resource [94], based on the work of Curtis et al. [95] in Australia, provides

evidence based shared treatment protocols for primary and secondary care.

One service taking a joint approach to the management of people with diabetes and mental health co-morbidities in the community is the 3 dimensions of care for diabetes service (3DFD) at King's College Hospital, a team which integrates medical, psychological and social treatments for people with poorly controlled diabetes. In doing so, it is possible to address the psychosocial problems which are impacting on adherence and health behaviours, and thus improving glycaemic control.

Screening and treatment

The Preventative Services Task Force in the US [96], and the National Institute for Clinical Excellence (NICE) in the UK [97] highlight the importance of screening for mental illness in people with disorders such as Diabetes. Reciprocally NICE, the European Psychiatric Association and the American Diabetes Association have all produced recommendations for monitoring for cardiovascular risk in people receiving anti-psychotics for SMI [54, 98, 99]. However, screening alone is not enough: protocols are needed to treat co-morbidities which emerge on screening. Kendrick et al. [100] found that even where co-morbid depression is identified, it is infrequently treated and, rates of treatment of dyslipidaemias in schizophrenia are shockingly low [101]. In the UK, the NHS has endeavoured to address this problem by changing the focus from screening for depression in long-term conditions, to treatment of depression where identified [102], while the Lester Cardiometabolic resource encourages clinicians to take that next step into management of identified cardiovascular risk factors [94].

Whose job is it?

The mental health worker has an obligation to provide mental health care for patients under their care. He/she likewise has an obligation to ensure that any physical health conditions of the patient receive adequate and equitable attention. For most patients in the community in the UK, the general practitioner is likely to be in the best position to co-ordinate physical care, but often practical difficulties get in the way, such as when patients lack capacity and will not engage in routine care. The nature of illness such as schizophrenia means that on occasion, problems such as thought disorder may interfere with giving a history in a short consultation while disorganisation may compromise adherence to management plans. Further confusion may arise for patients under shared care in the community, especially when there is inconsistency in

general practitioner attendance, all of which requires a flexible approach. Some organisations attempt to avert such conflict by recommending that the role of mental health services is to assess whether each service user is able to equitably access physical health services and to consider what extra support may be needed to allow such equitable access [103].

In acute inpatient settings the situation is clearer. The psychiatrist has primary responsibility to perform the appropriate investigations indicated, to ensure they are followed up as required and that specialist advice is sought when necessary. The time when a patient is in hospital can be a valuable opportunity to perform investigations and obtain specialist opinions. However, access to acute medical care while a mental health inpatient can also be practically difficult, for example when an acute mental illness renders attendance at accident and emergency problematic. Shockingly, in the year following discharge from inpatient care, people with SMI are twice as likely to die as the general population [31]. An inpatient stay is thus an important window of opportunity to enhance access to acute medical care and institute measures to prevent premature death. Flexible and imaginative approaches to providing medical assessments in the mental health unit are needed to bridge this gap.

Service structures for the management of mental health problems in physical health settings are much better established. The speciality of liaison psychiatry, or consultation-liaison psychiatry, is traditionally based in the general hospital to provide assessment and treatment for three main groups of patients: general hospital inpatients; patients presenting to the emergency department with psychiatric problems and managing the mental health needs of patients with long-term conditions. It entails psychiatrists working with other specialities to manage co-morbidities of mental and physical health issues, and might be expanded to include greater collaboration with primary care [104, 105].

This model of collaborative care has been demonstrated to be effective in diabetes, and reflects an important development of the liaison psychiatry model. Katon et al. [89] demonstrated that where diabetes care is integrated with mental health care, both biomedical and psychosocial outcomes improve. Developing models of collaborative care, although under-represented in the literature, may include changes in the structuring of healthcare services, with the introduction of a case-management approach. The NICE guidelines for depression in long-term conditions [97] suggest intensive case-management for people with depression and associated functional impairment which has failed to respond to psychological or pharmacological intervention, a combination of treatment modalities.

Barriers to access

Mental health problems may reduce the willingness or even the ability of individuals to effectively communicate and address their physical health needs. Social isolation may further reduce the likelihood that individuals will seek physical healthcare. Even when people engage with mental health services, mental health professionals may not routinely give sufficient attention to the physical assessment of patients presenting with psychiatric problems. And when people with mental health problems do attend general services, there may be an assumption that some physical symptoms are psychosomatic—so-called ‘diagnostic overshadowing’. In this population, there is some evidence of later diagnosis for physical illness, resulting in less favourable outcomes, which in diagnoses such as cancer, may result in poorer prognosis [48, 49]. There is likewise evidence of significantly lower rates of participation in free of charge cancer screening programmes, e.g. in Manitoba for both cervical and breast cancer screening by women with schizophrenia [106, 107].

In the UK even where cardiovascular risk factors are identified in medical records of people with chronic psychiatric illness, there is often limited intervention to ameliorate these risks [107]. Patients with enduring mental illness are 7 % less likely to have a cholesterol test and 15 % less likely to receive a statin prescription [108], although the quality of diabetes care is the same as that of the general population [109]. An Australian study examining the experiences of people with schizophrenia with cardiovascular disease over an 18-year period, found that they were significantly less likely to receive revascularisation procedures compared with the general population [110]. Even where health-promotion programmes exist, these are frequently designed in a way which make access difficult for people with SMI [23].

Integrating physical and mental health in public health policy

The report of the WHO Commission on Social Determinants in Health suggests a series of measures to tackle health inequalities, most of which are relevant to people with mental and physical health problems [111]. The report recommends addressing social determinants of health including taking steps to reduce poverty, improving access to education, ensuring better quality housing, encouraging community cohesiveness or improving the natural environment. Some of these are specific to the needs of people with mental and/or physical health problems; others may be included in general health promotion and public health strategies.

The EU Mental and Physical Health Charter has since suggested three key initiatives to improve overall health for people with both physical and mental health conditions [112]:

- (a) *Improving health literacy* Health literacy is a measure of the individual’s ability to process health information and is a factor of the relationship between a person’s literacy, language and numeracy levels. Low health literacy may hinder an individual in taking action to improve their health, and the presence of a mental illness may affect the person’s literacy levels. Improving health literacy may help addressing health inequalities, and may take a number of forms including self-help guides, easily accessible information, and electronically available information for patients, their carers and the public.
- (b) *Raising awareness among specific at-risk groups* Vulnerable population groups including people with severe mental illness may struggle to effect behaviour change based on routine advice and information on lifestyle, diet and exercise and may require more active approaches, such as monitoring by health professionals or peer advocates to help increase uptake of lifestyle advice. Carers and families can also play a pivotal role in helping individuals to stay physically healthy. Financial incentives such as the prescription of access to gym facilities or subsidies to help purchase healthy foods may also be of benefit. However, institutional obstacles may need to be overcome [23].
- (c) *Improved training in primary and specialist care* Although there is growing evidence of the issue of co-morbid physical and mental health problems, specialist care tends not to focus on co-morbidity. Psychiatrists have focused mainly on treating psychiatric symptoms at the risk of neglecting common physical health needs [27, 113, 114] and physicians vice versa. There is scope to improve how the psychiatrist can act to help promote physical health, and indeed how certain specialists, particularly oncologists, diabetologists and cardiologists might think about the mental health of the people they treat. This is particularly important for those joining the clinical professions, reducing the impact of Cartesian dualism, and rather educating to consider body and mind together.

Conclusion

Our review of the literature has indicated that mental and physical health are common co-morbidities and, where present, have a significant effect on health outcomes

including mortality. Service users, families, clinicians and policy makers all agree that a joined up approach to physical and mental health is needed [112, 115]. Creative approaches to improve the physical health and longevity of people with SMI in particular are urgently needed across the board. Parity of esteem between mental and physical health is now recognised as a national priority in the UK and other countries across the globe [116, 117].

Given the level of stigma that still surrounds mental health problems; social inclusion would be improved if people with mental health problems had better access to advice and support for physical health, with good communication between the various health professionals involved. Any programmes to help support people with chronic long-term physical health conditions likewise need to consider how to include people with mental illnesses, which otherwise may lead to poorer physical outcomes and exacerbate social exclusion [23].

Joint services already manage comorbidities and indeed multimorbidities in the context of liaison psychiatry. Complimentary physical health service approaches, tailored to local needs, would help improve health outcomes in people with severe and common mental illnesses.

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