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Mental health assessment in health checks of participants aged 30–49 years: A large-scale cohort study

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A B S T R A C T

Mental distress is an independent risk factor for illness related impairment. Awareness of mental health (MH) allows prevention, but early detection is not routinely performed in primary care. This cohort study incorporated MH assessment in a health promoting programme. We described the level of poor MH among health check participants, explored the potential for early intervention, and the potential for reducing social inequality in MH. The study was based on 9767 randomly selected citizens aged 30–49 years invited to a health check in Denmark in 2012–14. A total of 4871 (50%) were included; 49% were men. Poor MH was defined as a mental component summary score of ≤ 35.76 in the SF-12 Health Survey. Data was obtained from national health registers and health check. Participants with poor MH (9%) were more socioeconomic disadvantaged and had poorer health than those with better MH. Two thirds of men (64%) and half of women (50%) with poor MH had not received MH care one year before the health check. Among those with (presumably) unrecognized MH problems, the proportion of participants with disadvantaged socioeconomic characteristics was high (43–55%). Four out of five of those with apparently unacknowledged poor MH had seen their GP only once or not at all during the one year before the health check. In conclusion, MH assessment in health check may help identify yet undiscovered MH problems.

1. Introduction

Poor mental health (MH) is a growing public health concern with considerable human, social, and economic costs due to its correlation with mortality (Christensen et al., 2017), physical comorbidity (Dong et al., 2012; Mezuk et al., 2008; Prince et al., 2007; Gunn et al., 2012), socioeconomic deprivation (Korkeila et al., 2003; Kuruvilla and Jacob, 2007; Gunn et al., 2008), unhealthy behaviour (Hamer et al., 2009; Pisinger et al., 2009), and poor quality of life (Moussavi et al., 2007). Moreover, social inequality in MH is evident (Pinto-Meza et al., 2013). The risk of poor MH peaks during early- to mid-life (Kessler et al., 2007), and mental illness is one of the leading causes of disability in this age span (Murray et al., 2012). The prevalence of poor MH among Danish adults is 10% (Christensen et al., 2014). Early detection of poor MH is essential to improve both mental and physical health status and to prevent development of manifest mental disease (World Health Organization, 2004). Despite promotion of MH as a key priority for

public health policy in Europe (Wahlbeck, 2011), real community-based collaboration and research on MH promotion in a primary care setting are sparse (Fernandez et al., 2015).

Routinely offered health checks have been proposed as a means to improve the public health (Cochrane et al., 2012; Royal Australian College of General Practitioners, 2012), but the effects and the optimal content remain to be determined. Few studies on health checks including MH assessment have, to our knowledge, been published (Bjerkeset et al., 2006; Crisp and Priest, 1971), and in those cases the purpose was to identify mental disorders. However, MH ought to be considered as a broader concept than merely the presence or absence of mental disorders. The World Health Organization (WHO) defines good MH as 'a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community' (World Health Organization, 2001). If the means of MH assessment is to improve MH, and not only detect mental disorders, a

generic measure of poor MH may be required.

In a cohort study, we evaluated the use of the Mental Component Summary (MCS) of SF-12 in a community-based health check with close links to primary care. Overall, we aimed to investigate the level of poor MH among health check participants aged 30–49 years, the potential for early intervention, and the potential for reducing social inequality in MH. Based on literature on poor MH in the Danish general population (Christensen et al., 2014) we hypothesized that poor MH among health check participants would be associated with disadvantaged socio-economic characteristics, health behaviour, and health status. We further expected a higher proportion of participants with disadvantaged than of advantaged socioeconomic characteristics among those with presumably undetected poor MH (Packness et al., 2017). The objectives were (i) to describe associations between poor MH and socioeconomic characteristics, health behaviour, and health status among participants in a general health check, and (ii) to describe the socioeconomic characteristics of participants with presumably yet undetected poor MH.

2. Methods

2.1. Study design and population

The *Check Your Health* health promotion programme (Maindal et al., 2014) features a population-based preventive health check in the local health centre followed by a face-to-face consultation with the person's general practitioner (GP). The health check is offered to all citizens aged 30–49 years in Randers Municipality, Denmark in 2012–2017. The *Check Your Health* health promotion programme aimed at this age range because of the potential for prevention of development of both mental and physical diseases and possible complications. The health check focuses on risk factors for long-term conditions, e.g. cardiovascular disease (CVD) and diabetes, and on MH.

Except patients with terminal illness, all citizens in Randers Municipality at the age of 30–49 years at January 1, 2012 were randomised to an individual invitation date to the *Check Your Health* programme (n = 26,216). Citizens who were invited within the first approximately 2½ years (18 April 2012 to 1 October 2014), n = 9767, were eligible for the present retrospective cohort study. In the cohort, we included participants in the health check examination who completed a survey on MH (Fig. 1). A total of 4871 were included in the cohort (50% of the invited); men composed 49% of the study population. Informed consent was obtained from all participants in the study. The study was approved by the Danish Data Protection Agency. Approvement from The National Committee on Health Research Ethics was not required since the study used data from the ongoing *Check Your Health* programme.

2.2. Data sources

Survey data and clinical data were obtained from *Check Your Health* and linked to Danish registers through each participant's unique personal identification number, which is assigned to all persons with permanent residence in Denmark (Pedersen, 2011).

2.2.1. Mental health

MH was measured by the Mental Component Summary (MCS) score of the validated Danish version of the 12-item Short Form Health Survey (SF-12), version 2 (Gandek et al., 1998; Ware et al., 1996; Ware et al., 2002). MSC is based on 12 items on general self-rated health, mood and anxiety symptoms, physical health, and functional limitations during the past four weeks (Ware et al., 1996). For each item there are three to five response options (e.g. 'all/most/some/a little/none of the time'). Standard general population norms and scoring algorithm (US norms of 1998) were used to calculate MCS score (Ware et al., 2002). Calculation of MCS score is dependent on full completion of SF-12. The MCS score is measured on a continuous scale between 0 and 100; higher score reflects better MH. MCS score was categorised into poor (≤ 35.76), good (≥ 48.26), and moderate MH (in between) based on a Danish national health survey (Christensen et al., 2010). Rather than targeting specific psychiatric diagnoses, MCS provides a generic measure of MH. However, MCS is also validated against diagnoses of mental disorders (Vilagut et al., 2013; Kiely and Butterworth, 2015; Gill et al., 2007). A cut-point of ≤ 36 has a sensitivity of 0.62 for 30-day diagnosis of any depressive disorder and a sensitivity of 0.73 for 30-day generalized anxiety disorder (Kiely and Butterworth, 2015). The corresponding specificities are 0.88 and 0.90 (Kiely and Butterworth, 2015).

2.2.2. Mental health care

MH care was defined as at least one of the following within a year before completing the survey questionnaire: psychometric test or talk therapy by GP, contact to psychologist or psychiatrist, or psychotropic medication as recorded in the Danish national health registers (Table 1). These will hereafter be referred to collectively as 'MH care'.

2.2.3. Health behaviour and physical health

Data on smoking, alcohol risk behaviour, and self-rated health was collected from the health check survey. From April 2012 to July 2013, alcohol risk behaviour was calculated by CAGE-C and defined as > 2 positive answers to items 1–4 and 6, or one positive answer to items 1–4 and 6 plus alcohol intake on > 4 days per week (Zierau et al., 2005). From August 2013 to October 2014, alcohol risk behaviour was calculated by AUDIT (Saunders et al., 1993) and defined as ≥ 8 points for women or ≥ 8 points plus alcohol intake ≥ 2 times per week for men. Self-rated health was categorised into good and fair/poor measured by

9767 — Invited to participate in *Check Your Health*

3955 — Did not complete survey questionnaire

5812 (60%) — Completed survey questionnaire before 1 January 2015

537 — No health check

5275 (54%) — Participated in health check

404 — Did not complete all items of the SF-12
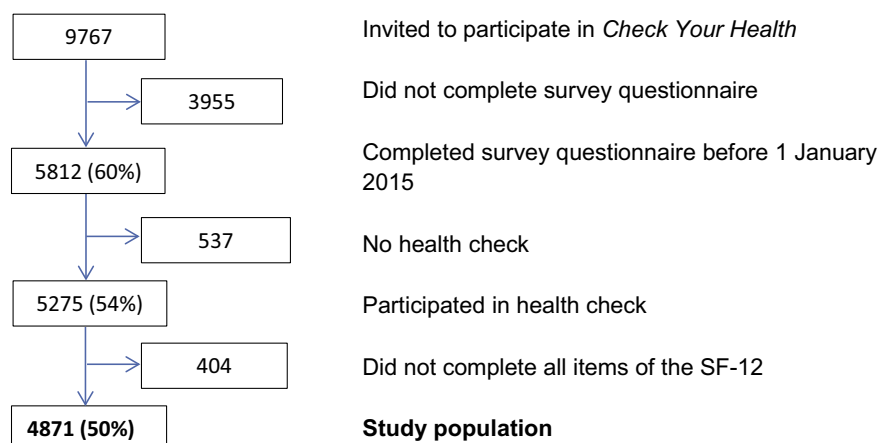
4871 (50%) — **Study population**

Fig. 1. Flowchart of inclusion of participants aged 30–49 years from Randers Municipality, Denmark, in the *Check Your Health* preventive programme from April 2012 to October 2014. SF-12: 12-item Short Form Health Survey, version 2.