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Dietary patterns and physical activity in people with schizophrenia and increased waist circumference

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ABSTRACT

Objectives: People with severe mental disorders die 10–25 years earlier than people in the Western background population, mainly due to lifestyle related diseases, with cardiovascular disease (CVD) being the most frequent cause of death. Major contributors to this excess morbidity and mortality are unhealthy lifestyle factors including tobacco smoking, unhealthy eating habits and lower levels of physical activity. The aim of this study was to investigate the dietary habits and levels of physical activity in people with schizophrenia spectrum disorders and overweight and to compare the results with the current recommendations and with results from the general Danish population.

Methods: We interviewed a sample of 428 people with schizophrenia spectrum disorders and increased waist circumference enrolled in the CHANGE trial using a Food Frequency Questionnaire (FFQ) and a 24 h recall interview, a Physical Activity Scale (PAS), scale for assessment of positive and negative symptoms (SAPS and SANS, respectively), Brief Assessment of Cognition in Schizophrenia (BACS) and Global Assessment of Functioning (GAF). We compared with information on dietary intake and physical activity in the general Danish population from the Danish National Survey of Dietary Habits and Physical Activity in 2011–2013 (DANSDA).

Results: The CHANGE participants reported a very low energy intake and their distribution of nutrients (i.e. fat, protein and carbohydrates) harmonized with the recommendations from the Danish Health Authorities, and were similar to the latest report on the dietary habits in the Danish general population. However, the intake of saturated fat, sugar and alcohol exceed the recommended amounts and the corresponding intake in the general population. The intake of fiber, vegetables and fruit and fish were insufficient and also less than in the general population. The overall estimated quality of the dietary habits was poor, only 10.7% of the participants had healthy dietary patterns, and the quality was poorer than in the general population. Even with a very liberal definition of the term “homecooked”, only 62% of the participants had taken any part in the preparation of their food. The level of physical activity was low and only one fifth of the participants complied with the recommendations of min. 30 min daily moderate-to-vigorous activity. Half of the CHANGE participants were smokers, compared to 17% in the general population. Negative symptoms were significantly associated with poorer dietary quality and less physical activity, whereas no such significant associations were found for cognition, positive symptoms or antipsychotic medication.

Conclusions: Even when accounting for some error from recall - and social desirability bias, the findings point in the direction that the average energy intake in obese people with schizophrenia spectrum disorders is not exceeding that of the general population, and that overweight may to some degree be a result of physical inactivity and metabolic adverse effects of antipsychotic medication. The physical activity level is low and the rate of tobacco smoking is high, and our results suggest that negative symptoms play a significant role. Future research should focus on bringing about lifestyle changes in this fragile population in order to reduce the excess risk of CVD and mortality.

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1. Introduction

Lifestyle diseases and overweight/obesity challenges the Western world, and especially the socially vulnerable populations (Candib,

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2007). It is well established that people with severe mental disorders die 10–25 years earlier than people in the Western background population (Laursen et al., 2013), mainly due to lifestyle related diseases, with cardiovascular disease (CVD) being the most frequent cause of death. The prevalence of CVD in people with schizophrenia is up to three times that in the background population (Correll et al., 2017; DE Hert et al., 2011; Vancampfort et al., 2015a, 2015b). Major contributors to this excess morbidity and mortality in people with schizophrenia have been explained with the use of antipsychotic drugs, especially second generation antipsychotics (SGAs) (Reynolds, 2012), and with unhealthy lifestyle factors including higher frequencies of tobacco smoking (McCreadie, 2003), lower levels of physical activity (Stubbs et al., 2016), and unhealthy eating habits. The latter has been described in studies with results suggesting lower intake of fresh fruit, vegetables and wholegrain products, more saturated fat and generally less variety in the diet (Bly et al., 2014; Bobes et al., 2010; Dipasquale et al., 2013; Kilbourne et al., 2007). However, descriptive studies of lifestyle factors in people with severe mental disorders are few, and only few have reported dietary intake and physical activity combined.

There is evidence that dietary patterns rich in fruit, vegetables, fish, whole grain, nuts and fiber and lower in trans fatty- and saturated fatty acids, are likely to play a key role in lowering the risk of CVD (Kieffe-de Jong et al., 2014) and certain cancers (Brunner et al., 2013). It is also proven that sedentary behavior is a substantial risk factor for CVD and that regular physical activity and exercise is associated with cardiovascular health and reduced CVD risk (Barry et al., 2014; Després, 2016).

In Denmark the governmentally funded Danish Veterinary and Food Administration advises and issues recommendations to consumers and enterprises about nutrition, healthy eating and food production. It emphasizes making healthy choices easy for the population through nutrition labels such as The Keyhole Label (The Danish Veterinary and Food Administration, 2017a) and Whole Grain logo (The Danish Veterinary and Food Administration, 2017b) as well as target group specific recommendations. New dietary recommendations building on the evidence based Nordic Nutrition Recommendations (Nordic Council of Ministers, 2008) were launched in September 2013 (Administration, 2016); both can be seen in Supplementary Table 1.

However, giving dietary and lifestyle advice to the general population appears to have only modest effect in bringing about beneficial changes in diet and cardiovascular risk factors (Brunner et al., 2013). The latest Danish National Survey of Dietary Habits and Physical Activity report concludes that the populations' diet is "too fat, too sweet, and with too low dietary fiber content compared to the recommendations" (A. N. Pedersen et al., 2015), and less than half of the population comply with the recommendations regarding physical activity (Matthiessen et al., 2006). Similar findings have been made in the United States (Wilson et al., 2017) and in other western and Nordic countries (Jankovic et al., 2015). In people with serious mental illness this challenge appears even more difficult, given the range of psychiatric symptoms, medication side effects, social and cognitive difficulties associated with the illness (J Firth et al., 2016; Hudson, 2005). Especially negative symptoms and antipsychotic side effects are known to reduce motivation for physical activity and healthy eating (Cuerda et al., 2014; Deng, 2013; Vancampfort et al., 2015a, 2015b), low socioeconomic status contributes to reduced access to healthy foods (Agerbo et al., 2004) and poverty is generally associated with poor diet (Leung et al., 2012). A meta-review recently stated that programs tailored to address risk factors and lifestyle directed at the general population do not seem to address the health needs of people with serious mental illness (Pearsall et al., 2014; Ward et al., 2015).

The aim of this study was to investigate the dietary habits and levels of physical activity in people with schizophrenia spectrum disorders and overweight or obesity and to compare the results with the current recommendations and with results from the general population. By interviewing a sample of 428 people with schizophrenia spectrum

disorders and overweight or obesity, we aimed to answer the following questions:

- What was the dietary intake of energy and the nutritional distribution?
- How large were the intakes of different food groups and how did this compare to the official Danish recommendations?
- How did the nutritional distribution and the dietary patterns compare with the official Danish recommendations, and with the dietary patterns in the Danish general population?
- How much time was spent on moderate or vigorous physical activity?
- Were negative symptoms, cognitive or general psychosocial functioning, alcohol- or drug abuse or medication associated with dietary quality and/or level of physical activity?

2. Method

2.1. Design

This study used baseline data from the CHANGE trial, the design and results of which have been described in detail elsewhere (Speyer et al., 2015, 2016). Briefly the CHANGE trial was a three-arm superiority randomized clinical trial investigating the effect of a lifestyle intervention focusing on diet, physical activity and smoking cessation in people with severe mental disorder. The study aimed to decrease the incidence of cardiovascular diseases. The study population comprised a sample of 428 men and women aged 18–75 years with a diagnosis of schizophrenia or schizoaffective psychosis and a waist circumference above the international recommendations (National Health Institute, 2017.; Sundhedsstyrelsen, 2013) (>88 cm for women or > 102 cm for men). These recommendations are based on the sex-specific cutoffs associated with increased risk of diabetes and CVD (Janssen et al., 2004). All enrolled subjects were living in Copenhagen or Aarhus in Denmark and had given informed consent. Baseline measures were collected during the period December 2012 to May 2014; post-intervention follow-up measures were collected December 2013 to June 2015.

2.2. Outcomes

At baseline assessment prior to randomization the participants were by oral interview asked to recall all foods and beverages consumed for the last 24 h prior to interview and additionally to complete a Food Frequency Questionnaire (FFQ) (Toft et al., 2007). Food photographs were used to help the respondent with the task of describing portion sizes. From the 24 h food and beverage intake recall interview each patient's intake of energy (in kilojoules) and the distribution of nutrients (carbohydrates, protein, fat and alcohol) was calculated using the Dankost Pro software (Dankost, 2015). From the FFQ the dietary quality score (DQS) (Toft et al., 2007) was calculated based on a three-point scoring system that was developed for each of the four food groups: fish, fruits, vegetables and fats (see Supplementary Table 2).

The cut off point for a high score in the fat group was no use of spread and no use of fat or use of olive oil for cooking. The lower cutoff points in the four food groups were defined as only using saturated fats for cooking and spread; no intake of fish; a very low intake of fruits (≤ 2 pieces/week) and vegetables (≤ 2 servings/week), respectively. Summation of the four food variables resulted in a score ranging from 4 to 12 points. A diet with the DQS of 4–6 points is considered "unhealthy", while 7–9 points suggest an "average" diet and 10–12 points suggest a "healthy" diet. Construction of the DQS is described in detail elsewhere (Toft et al., 2007). Also from the FFQ we reported the daily consumption of fruit and vegetables and the weekly consumptions of meat and fish, respectively.

Physical activity was estimated as self-reported time (minutes daily) spend sedentary and on moderate and vigorous physical activity,

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