Study protocol

Official title: Welfare benefits for individuals with functional somatic disorders
DanFunD

Background

Functional somatic disorders (FSD) are common conditions characterized by persistent patterns of physical symptoms that cannot be better explained by other physical or mental conditions (1). The conditions may cause severe impairment for the patients who present with reduced physical and mental health, lower social status, and poor labour market association (2-4).

In 2005, it was estimated that FSD accounted for 3% of hospitalizations and 10-20% of health care expenses in Denmark (5), and a newer Danish primary care study has shown patients with FSD to have higher annual health care costs compared with conventionally-defined conditions (6). In other countries, studies in clinical samples have shown increased direct and indirect health care costs of FSD (7, 8) showing a dose-response relationship with severity of the FSD (9). These studies into highly selected clinical samples may induce high risk of selection bias, and studies including random selected general population samples are therefore needed. One Canadian population-based study on health care costs of children, adolescents, and young adults with FSD also found increased health care use and costs for this group (10). Studies investigating the socioeconomic burden in terms of welfare benefits of FSD in an adult random sample from the general population are, however, lacking.

Objective

To estimate the number of weeks of welfare benefits, i.e. sickness benefit, unemployment benefit and social assistance, for individuals with FSD and compare them to individuals without FSD and individuals with severe physical disease.

Data

Data from the DanFunD baseline cohort will be included (11); individuals with FSD are identified by means of self-reported questionnaires (n=9,656) (2) and diagnostic research interviews[1] (n=1,590) (12). Individuals with severe physical disease are identified by self-reported questionnaires.

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[1] Given the circumstances that interview-data are uploaded in Statistics Denmark

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Dependent variable:

Data on welfare benefits will be obtained from The Danish Register for Evaluation of Marginalization (DREAM) which contains data on Danish citizens who have received social benefits or other welfare payments (13). Welfare benefit will be counted as number of weeks per year in a 10-year period before and 5-year period after the day the participant participated in the DanFunD baseline investigation.

Welfare benefits will be grouped into 7 categories where categories 1-3 are the main categories for investigation and categories 4-7 are used in order to exclude weeks of no transfer income/self-support, public retirement pension, emigration, and death (Table 1).

TABLE 1

Category	Explanation	Coding in DREAM (Danish)
1) Sickness benefit	Individuals who receive sickness benefits such as employed citizens being ill, unemployed citizens currently ill, citizens in activation programs currently ill, and citizens in flexible jobs but currently ill	Ledighedsydelse (740, 743-748) Revalidering (760, 763-768) Fleksjob (771) Fleksjob, Sygedagpenge under fleksjob (774) Ressourceforløb (810, 813-818) Jobafklaring (870, 873-878) Sygedagpenge (890, 893-899)
2) Unemployment benefits	Unemployed citizens who receive unemployment benefit (full or part time, during vacation or activation) together with citizens on social assistance who are deemed ready-to-work, only receiving social assistance because of unemployment, but having no entitlement to unemployment benefit.	Dagpenge, ledighed (111) Supplerende dagpenge, ledighed (115) Kontanthjælp, jobparate (130, 133-139) Uddannelseshjælp, åbenlyst uddannelsesparat (140, 143-149) Uddannelseshjælp (720, 723-729) Kontanthjælp (730, 733-739)
3) Social assistance	A welfare payment administered by the municipal social service department and is allocated if citizens are unable to support themselves.	Skånejob (781) Førtidspension (783)
4) No transfer income/self-support	Individuals that do not receive welfare payments under the circumstances of sickness, unemployment, or social benefits. Including leave-of-absence schemes and grants from State Education Fund.	Voksenlærlinge (521) Efterløn (621) SU med ydelse (651) SU uden ydelse (652) Voksen uddannelsesstøtte og staten voksen uddannelsesstøtte (661) Barselsdagpenge (881)

5) **Public retirement pension**	Folkepension (998)
6) **Emigration**	Ikke bosiddende i Danmark (997)
7) **Death**	Død (999)

Independent variables:

Participants with FSD will be defined as follows:

- FSD operationalised by the Bodily Distress Syndrome single- and multi-organ type will be defined with both self-reported questionnaires (14) and diagnostic interviews[2] (3)

- Three functional somatic syndromes, i.e. irritable bowel (15), chronic widespread pain (16), and chronic fatigue (17) will be defined with questionnaires

Severe physical disease will be defined as having received at least one of the following five diagnoses: Cancer, stroke, myocardial infarction, other heart disease, and obstructive pulmonary disease.

Analytical plan

Analyses will be conducted by Stata Statistical Software, version 17 (18). Separate analyses for each time period (10 years before and 3 years after the DanFunD baseline investigation) will be conducted.

FSD case/FSD non-case descriptives:

Percentages of participants having received at least one week of welfare benefits during the 10-year period before baseline and the 5-year period after baseline will be calculated for each FSD definition and displayed in figures (see example in Figure 1).

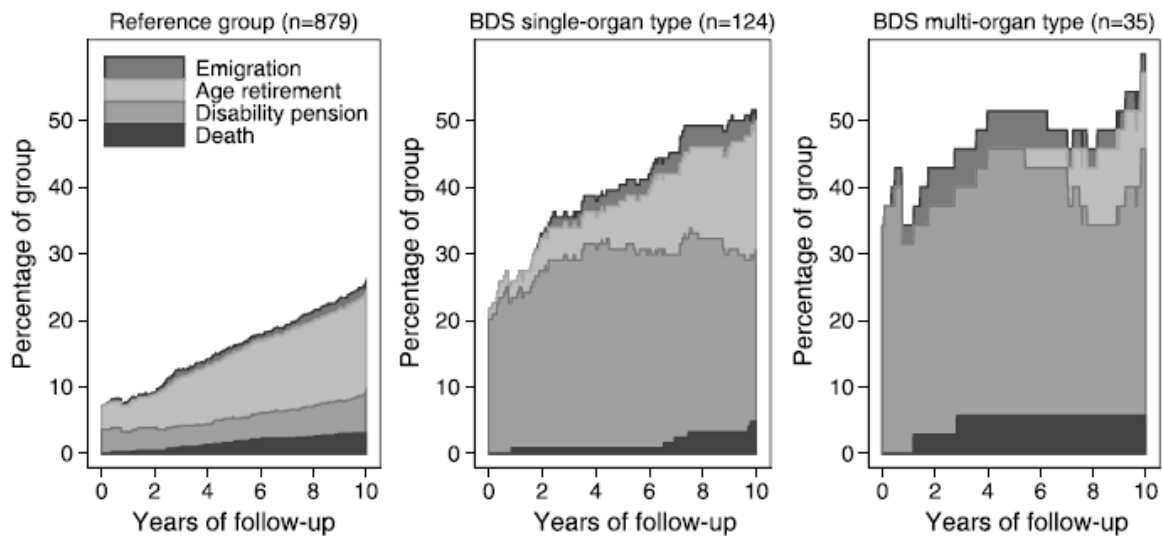[2] Given the circumstances that interview-data are uploaded in Statistics Denmark

Figure 1

FSD case/FSD non-case differences:

To compare the mean number of weeks receiving sickness benefit, unemployment benefit, and social assistance, respectively, between cases and non-cases of FSD, linear regression analyses on each of the three main welfare variables will be performed with welfare benefit variables as the continuous dependent variable and the dichotomous FSD case-status variables as the primary independent variable. β-coefficients with 95% confidence intervals (CI) will be used as measure of association, and all analyses will be adjusted for sex and age. Linearity of age will be checked by expanding the model with natural cubic splines with five knots at the 5th, 27.5th, 50th, 72.5th, and 95th percentiles according to the recommendations by Harrell (19). Deviations from linearity will be tested using a χ^2-test ($p<0.05$). To account for the possible positive skew and outliers in the welfare variables, optimally non-parametric bootstrap resampling with 100,000 repetitions will be performed. Significance will be judged from 95% bootstrapped CI of differences not overlapping with 0. If the assumptions for performing non-parametric bootstrap resampling are not fulfilled, generalized linear models will be used instead.

To compare the odds of having received at least one week of sickness benefit, unemployment benefit, or social assistance, between cases and non-cases of FSD, logistic regression analyses will be performed with welfare benefit variables as the dichotomous dependent variable and the dichotomous FSD case-status variables as the primary independent variable. Odds ratio with 95% CI will be used as measure of association.

FSD case/severe physical disease descriptives:

Percentages of participants receiving at least one week of welfare benefits during the 10-year period before baseline and the 5-year period after baseline will be calculated for individuals with FSD (and no severe physical disease) and individuals with severe physical disease (and no FSD) and displayes in figures (see example in Figure 1).

FSD case/severe physical disease differences:

To compare the odds of having received sickness benefit, unemployment benefit, or social assistance, between FSD cases and individuals with severe physical disease, logistic regression analyses will be performed with welfare benefit variables merged into a dichotomous dependent variable with two levels (0 = number of weeks < the median number in the total sample (reference), 1 = number of weeks ≥ the median value in the total sample) and a dichotomous primary independent variable with two levels (0 = severe physical disease (reference) and 1 = FSD. Odds ratio with 95% CI will be used as measure of association.

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