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Associations between adolescent and adult socioeconomic status and risk of obesity and overweight in Danish adults

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KEYWORDS

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Summary

Background: It has been suggested that socioeconomic status (SES) may influence the risk of obesity; however it is important to consider individual changes in SES over the life-course in addition to SES at specific time-points to better understand the complex associations with obesity. We explored the relationship between lifetime-specific and life-course SES and risk of obesity and overweight in Danish adults.

Methods: Data were used from the Danish Youth and Sports Study (DYSS) – a 20–22 year follow-up study of Danish teenagers born between 1964 and 1969. Baseline data gathered in 1983 and 1985 included self-reported BMI, SES and physical activity. The follow-up survey (2005) repeated these assessments in addition to an assessment of diet. Complete data on adolescent and adult SES and BMI were available for 623 participants.

Results: Following adjustments, adolescent SES had no significant association with overweight/obesity in this sample, however females of low or medium adult SES were significantly more likely to be overweight/obese compared to those of high SES (low SES: OR: 2.7; 95% CI: (1.3–5.8); $p=0.008$; medium SES: OR: 4.0, 95% CI (1.6–10.2); $p=0.003$). Females who decreased in SES during adulthood were significantly more likely to be overweight/obese compared to those who remained of high SES (OR: 3.1; 95% CI (1.1–9.2); $p=0.04$).

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Conclusion: Effects of early life-factors may be conditional upon the environment in adulthood, particularly for the women. Further research should consider the timing of SES exposure and the mechanisms which may be responsible for the socioeconomic gradients in prevalence of obesity and overweight.

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Introduction

The socio-economic gradients in health are of great public health concern [1]. The last couple of decades have seen a plethora of literature on socioeconomic differences in health outcomes such as coronary heart disease, stroke and all-cause mortality [2,3]. Obesity is believed to be one of the mechanisms responsible for such associations; therefore the socioeconomic gradients among obesity rates have been extensively examined in recent years. One of the largest bodies of evidence, a review by Sobal and Stunkard [4] found consistently inverse associations between socioeconomic status (SES) and obesity for women in developed societies, and a higher likelihood of obesity among those of higher SES in developing societies. The association between obesity and SES has been supported by more recent reviews [5,6] and there is now reasonable evidence that associations between SES and obesity may vary according to gender. Stronger associations are found among females from high income countries compared to males [4,7].

The relationship between obesity and SES may be bi-directional as obesity may influence SES, however SES may also influence the risk of obesity [8]. It has become widely recognized that social and biological factors that have developed over the life-course may influence adult health status and this has led to an increased interest in the life-course determinants of obesity [9–11]. Examining SES at a single time-point in life does not take into account the temporal nature of this association and may only partly explain the contributions of socioeconomic factors to health status or how these change over time [12].

In an attempt to best capture the individual cumulative and dynamic nature of SES, several models have been developed to examine life-course SES. The sensitive-periods model recognize that individuals may be more vulnerable to low SES exposure during certain time-points, leading to permanent (critical period) or modifiable (sensitive period) changes in disease risk [13]. Indeed, a recent meta-analysis found inverse associations between childhood socioeconomic status (SES) and

adult obesity, however effect sizes were typically reduced when adjustments were made for adult SES (education) [7]. Similarly, other studies which have adjusted for adulthood SES typically find reduced effect sizes. This suggests that adulthood SES is important in explaining the observed associations between childhood SES and obesity.

The social-mobility model acknowledges that SES is dynamic and it incorporates the trajectory of socioeconomic mobility across one's lifetime in determining disease risk [13]. Studies examining the effects of SES trajectory have produced inconsistent results with negative effects found among both the downwardly [9,14–16] and upwardly social mobile individuals [17]. Others did not find any association between social mobility and BMI or waist-hip ratio [18].

It may be the accumulation of multiple adverse circumstances experienced by lower SES groups throughout the life-course which lead to social inequalities in health [19]. This accumulation of risk model is the summed effect of SES that interacts to increase disease risk across a person's life-course [13], and may therefore help understand the mechanisms by which social inequities in health develop and are maintained. However, there has been little examination of individual cumulative influences of adverse circumstances during a lifetime on social inequalities in obesity [20,21]. Irrespective of model choice, it is important to consider the range of confounders which exist in the obesity–SES relationship, particularly parental and childhood/adolescent BMI as it is well established that adolescent and parental obesity influences the development of obesity later in life [22].

Our hypothesis is that during a lifetime, SES influences the risk of adult obesity and overweight. Therefore, the aims of this current study were to explore the relationship between lifetime-specific and life-course SES and risk of adult obesity and overweight by (a) examining the relationship between adolescent and adult SES and the risk of adult obesity and overweight; (b) determining the impact of individual SES mobility on the risk of adult obesity and overweight; (c) evaluating the extent to which individual cumulative life-course SES is

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