

Title: Socioeconomic disadvantage, mental health and substance use in young men in emerging adulthood.

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Acknowledgements

The research on which this paper is based on was conducted as part of the Australian Longitudinal Study on Male Health by the University of Melbourne. We are grateful to the Australian Government Department of Health for funding and to the boys and men who provided survey data.

ABSTRACT

Emerging adulthood is a neglected phase of the life course in health research. Health problems and risk behaviours at this time of life can have long term consequences for health. The 2016 Lancet Commission on Adolescent Health and Wellbeing¹ reported that the influence of socioeconomic factors was under-researched among adolescents and young adults. Moreover, the influence of socioeconomic factors on health has been little researched specifically in emerging adult men. We aimed to investigate associations between socio-economic disadvantage and mental health, suicidal behaviour and substance use in young adult Australian men. Logistic regression was used to examine the association between Year 12 (high school) completion and area disadvantage on mental health, suicidal behaviour and substance use in 2,281 young men aged 18-25 participating in the Australian Longitudinal Study on Male Health (Ten to Men). In unadjusted analysis both Year 12 non-completion and area disadvantage were associated with multiple adverse outcomes. In adjusted analysis Year 12 non-completion, but not area disadvantage, was associated with poorer mental health, increased odds of suicidal behaviour, and substance use. Retaining young men in high school and developing health promotion strategies targeted at those who do exit education early could both improve young men's mental health and reduce suicidal behaviour and substance use in emerging adulthood.

KEYWORDS: mental health, suicide, substance use, socio-economic position, male health

INTRODUCTION

Emerging adulthood broadly occupies the years between 18-29². The defining characteristics of this phenomenon have been detailed^{3,4} and include heightened instability, a diversity of occupational and educational activities and trajectories, lack of long-term commitments, as well as greater autonomy and freedom than in adolescence. Emerging adulthood reflects the now extended period of transition in high-income countries from the end of adolescence to entry into adult roles such as stable work, long term relationships and parenthood². Cote and Bynner (2008) have argued that emerging adulthood is a historical phenomenon resulting from changing social, economic and demographic structures in developed countries. These shifts include changing labour markets, the expansion of tertiary education, deferral of marriage and parenthood and so on⁴. Technologically driven economic and social change and increasing globalization continue to reshape the context within which young people make the important transition into adulthood, underscoring the importance of investigating the factors that impact on health behaviours and decisions made during this life stage. For young men, mental health problems, suicidal behaviour and substance use problems are among the leading causes of disease burden^{5,6}. These health problems can appear in adolescence however their course and severity during emerging adulthood has potentially far-reaching consequences for future health and life opportunities given the important life transitions made in this period.

It is widely accepted that socioeconomic disadvantage is an important social determinant of health and driver of health inequalities across populations, including in high-income countries such as Australia⁷. To date, most research on social determinants of health over the life-course has focused on early childhood determinants of later life health, many of which are related to parental socioeconomic and behavioural characteristics^{8,9}. The transitional nature of emerging adulthood may mean that parental factors still have some influence on health status and behaviour. However, given the defining features of this life stage include increase autonomy and responsibility for lifestyle choices, including

health, it would be expected that parental characteristics and behaviours will be less salient for emerging adult than for childhood health. A 2012 report on the social determinants of adolescent health found widespread effects of socioeconomic disadvantage across various health indicators in adolescence at a country level ⁹, although this area remains under-researched ¹.

Socioeconomic factors are seldom specifically investigated in studies of emerging adult health and we found few studies reporting data on socioeconomic disadvantage in young adult men separately. In studies reporting data for young men separately, unemployment was associated with alcohol use ¹⁰ and no association was found between parental socioeconomic status during adolescence and depression¹¹. In studies of emerging adult men and women combined, low family socioeconomic status in childhood or adolescence has been associated with depression ^{12,13} and smoking ^{14,15} in emerging adulthood. Lower educational attainment has been linked with depression ^{12,16}, harmful alcohol and illicit drug use ¹⁷ and smoking ¹⁵. Additionally, unemployment or low occupational status has been associated with depression ^{10,16}, alcohol use ^{17,18} and smoking ¹⁵. Area level socio-economic disadvantage has also been linked to a range of poorer mental and physical health outcomes in adulthood and adolescence¹⁹. However, as with individual level socio-economic factors there have been few studies in emerging adult populations. Among those, studies of primarily African-American emerging adults have reported positive association with neighbourhood characteristics and marijuana ^{20,21}, alcohol ²¹ and depression²².

The relationship between socio-economic factors and mental health and substance use problems during emerging adults may be of particular import given the crucial developmental tasks that occur at this life-stage such as completing education, transitioning from the family home to autonomous living, forming long-term relationships, and entering the workforce. Young men with fewer socio-economic resources may be more vulnerable to poorer mental health and substance use problems, which in turn may impact on their ability to successfully complete the developmental tasks of this life stage, and thereby influence their future socio-economic status, which in turn will further impact their health and

wellbeing²³. Further understanding the role of socioeconomic factors in the mental health and substance use behaviour of young men as they transition into adult roles may aid in identifying targets for intervention during this important life-stage.

In this study, we use baseline data from a national cohort of young men participating in the Australian Longitudinal Study on Male Health (Ten to Men) to explore the association between socioeconomic disadvantage and mental health problems, suicidal behaviour and substance use in emerging adulthood. We examine two socioeconomic indicators – educational attainment (completion of high school) at the individual level and area socioeconomic disadvantage (operationalized using a national area-based index of relative social disadvantage) – to identify health outcomes and behaviours associated with disadvantage. We also explore if either of the socioeconomic indicators examined was more strongly associated with those health outcomes and behaviours.

METHODS

Sample, recruitment and data collection

Ten to Men used a multi-stage stratified cluster random sampling design and oversampled in regional and rural areas. Full details of sample design are provided elsewhere²⁴. All males aged 10-55 residing in a private dwelling as defined by the Australian Bureau of statistics²⁵ in 622 randomly sampled Statistical Areas (SA1s) were eligible to join the study. A private dwelling is most commonly a house or apartment. Residents in dwellings that provide a communal or transitory type of accommodation, such as hotels, motels, guest houses, prisons, religious and charitable institutions, boarding schools, Defence establishments, hospitals and other communal dwellings were not eligible²⁵.

SA1s are the smallest unit at which data from the Australian Bureau of Statistics (ABS) 2011 Census of Population and Housing is available and have an average population of 400 persons (range 200-800).

Recruitment took place between October 2013 and July 2014. A household recruitment method was

used where all private dwellings in sampled SA1s were approached, the eligibility of all residents ascertained, and all eligible male residents were invited to participate. 104,884 households were approached, resulting in the identification of 45,510 eligible males, 15,988 of whom participated (35%). This analysis includes data from participants aged 18 to 25 years (n=2,281), each of whom completed a hardcopy questionnaire which elicited data on multiple health and lifestyle domains, including individual and socioeconomic and environmental factors.

The study was approved by the University of Melbourne Human Research Ethics committee (HREC 1237897) and all participants provided written informed consent.

Measures

Outcomes

Lifetime depression and anxiety were ascertained by the question *'Has a doctor or other health professional ever told you that you had this condition?'* with depression, PTSD and 'other anxiety disorders' as responses. PTSD and other anxiety disorders were combined into a lifetime anxiety variable. Lifetime suicidal thoughts and behaviours were captured using standard questions: *'Have you ever seriously thought about killing yourself?'* and *'Have you ever tried to kill yourself?'*²⁶. Twelve month harmful/hazardous alcohol use (yes, no) was assessed using the Alcohol Use Disorders Identification Test in which harmful or hazardous alcohol use is defined as an alcohol dependence score of 8 or more²⁷. Twelve month marijuana use (yes, no) was ascertained using questions from the Australian School Students Alcohol and Drugs Survey²⁸. Current smoking status was ascertain using the question *'Do you currently smoke?'* (yes, no)

Socioeconomic indicators

We examined two socioeconomic status indicators. For educational attainment at the individual level, we used completion of Year 12 (i.e., completion of the final year of high school). Education level is a well-documented social determinant of health, with studies showing a linear pattern of education level and poorer health outcomes^{29,30}. Moreover, in this population young men are in a transitional time of

life where some are undertaking further education, some are entering the full-time workforce, some living independently and others still living in the family home we sought an individual-level socioeconomic indicator which would have the most complete data for the whole cohort. We chose Year 12 completion rather than tertiary education as the indicator given that most Australian 18-year-olds will have met this milestone and either achieved, or not achieved, Year 12 as a minimum qualification.

For area socioeconomic disadvantage, we used the Australian Bureau of Statistics Socioeconomic Indexes for Areas - Index of Relative Socioeconomic Disadvantage (SEIFA-IRSD). This is a general socioeconomic index produced from census data that summarizes a range of indicators of economic and social disadvantage including household income, educational attainment, occupational skill level of area residents etc.³¹. It presents a score of relative disadvantage, so for example a low score indicates relatively greater disadvantage in general. For example, an area could have a low score if there are (among other things) many households with low income, many people with no qualifications, or many people in low skill occupations. SEIFA rankings were matched to recruitment SA1s and areas grouped into quintiles, where the first quintile (Q1) contained areas of greatest disadvantage and the fifth quintile (Q5) contained areas of least disadvantage.

Covariates

Demographic variables included current age, region of residence, and country of birth (Australia or elsewhere).

Analyses

We compared demographic characteristics and mental health, suicidal behaviour and substance use outcomes by Year 12 completion status and area disadvantage in unadjusted univariate analyses using Chi Square statistics for categorical variables and anova for age. We then ran logistic regressions for each of the outcomes with Year 12 non-completion and area disadvantage as exposures, and adjusting for age, region of residence, country of birth and indigenous status. Potential mediators were not

included in these analyses to avoid bias, for example including mental illness as a mediator in a model with suicidal behaviour as an outcome and low-educational attainment as an exposure, can introduce selection bias due to conditioning on a common effect (see Miller et al ³² for more detail) . Regression analyses were adjusted for the study design using the method recommended by Spittal et al ³³, which recommends the use of sampling weights to adjust primary sampling unit as Statistical Area 1 as well as adjusting for the multi-stage sampling design.

RESULTS

Univariate analyses

Table 1 shows demographic characteristics of young men aged 18-25 in the Ten to Men cohort overall and compared by Year 12 completion status and area disadvantage.

Young men who had not completed Year 12 were older, more likely to be born in Australia and be of Indigenous origin, and less likely to reside in a major city than young men who had completed Year 12. As area disadvantage increased, the proportion of young men completing Year 12 decreased.

Compared with young men living in areas of least socioeconomic disadvantage (quintile 5) young men living in areas of greater disadvantage were slightly older, less likely to reside in a major city, and more likely to be of Indigenous origin.

Year 12 non-completion and residing in an area of greater socioeconomic disadvantage were both associated with lifetime depression, lifetime suicidal ideation, and being a current smoker. Year 12 non-completion alone was associated with lifetime anxiety disorder, suicide attempt, harmful/hazardous alcohol and marijuana use in the past 12 months.

<insert Table 1 here>

Multivariate analysis

Non-completion of Year 12 remained associated with increased likelihood of all outcomes after adjusting for demographic factors and area disadvantage (Table 2). The odds were highest for smoking, with an almost three-fold increase in odds of smoking among those who did not complete year 12. Anxiety had slightly greater odds than depression (OR=1.74, 95%CI:1.17-2.61 and OR=1.59, 95%CI:1.12-2.23 respectively). Lifetime suicide ideation showed increased odds, albeit with a confidence interval lower bound close to one (OR=1.39, 95%CI:1.01-1.93, and there was a more than two-fold increase of odds for suicide attempt (OR=2.31, 95%CI:1.32-4.05). The latter should be interpreted with caution given the relatively low occurrence of suicide attempt, reflected in the wider confidence intervals. Current smoking had the strongest association with Year 12 non-completion, with an almost three-fold increase in odds (OR=2.75, 95%CI:1.93 – 3.91), followed by 12-month marijuana use (OR=1.62, 95%CI:1.21-2.16). Harmful/hazardous alcohol use showed a 46% increase in odds for Year-12 non-completers; this lower than 12-month marijuana use as it measures drinking at harmful levels, not any use.

Except for lower odds for 12-month marijuana use in areas of greatest disadvantage compared to areas of least disadvantage (OR=0.51; 95% CI 0.30-0.87), no other outcome was associated with area disadvantage after adjusting for Year 12 completion and demographic factors (Table 2).

<insert Table 2 here>

DISCUSSION

In this national cohort of young Australian men, we found that socioeconomic disadvantage was associated with higher prevalence of poorer mental health and substance use. These included higher prevalence of depression, anxiety and suicidal behaviour, harmful alcohol use, marijuana use and smoking. Analysis of two indicators of socioeconomic disadvantage, Year 12 (high school) completion and area socioeconomic disadvantage, controlling for potential confounders, consistently found non-

completion of Year 12, but not area socioeconomic disadvantage, was associated with increased odds for poorer lifetime mental health and engaging in substance use behaviours in the past 12 months. Moreover, given that the outcomes we examined frequently co-occur, and that our analysis of individual outcomes revealed non-completion of Year 12 was associated with poorer health on all outcomes, our findings suggest that young men who do not complete Year 12 are at greater risk for multiple poor outcomes. We examined if non-completion of Year 12 and greater area-disadvantage were associated with increased likelihood of experiencing higher rates of poorer outcomes. We found that non-completion of Year 12 was associated with greater negative outcomes but area disadvantage was not [see Supplementary file for analysis].

The link between socioeconomic status and mental health has been widely documented. In this study, young men who had not completed Year 12 were more likely to report a lifetime diagnosis of depression or anxiety. Early onset depression has been associated with increased risk for a range of adverse health and social outcomes including poorer academic achievement and increased risk of anxiety disorders, substance abuse and suicidal behaviour in both adolescence and emerging adulthood, though not necessarily in a directly causal relationship³⁴. We found a similar constellation of adverse outcomes among young men who had not completed Year 12, including greater odds of anxiety, suicidal behaviour, problem alcohol use and illicit drug use. Although area disadvantage has been linked to poorer mental health and higher levels of substance use^{35,36}, in this study of young Australian men it was not associated with either after adjusting for age, area of residence, country of birth, Indigenous status and Year 12 completion.

The recent Lancet commission noted that education was a powerful driver of adolescent health across the globe particularly with respect to mental health, alcohol use and sexual health¹. In this study, non-completion of high school was associated with increased odds for adverse mental health outcomes and substance use. Moreover, we found that at this life-stage, educational attainment was more strongly associated with adverse outcomes than area disadvantage. The relationship between

lower educational attainment as a marker of lower SES and poorer health is complex and there are multiple putative pathways through which high school educational attainment is thought to be involved in mental health problems and substance use behaviours in adolescence and subsequently in emerging adulthood.

Better educated individuals generally will have better access to health-related information but also increased capacity to use that information³⁷. While health knowledge has been shown to account for some of the differences in smoking, alcohol use and physical activity in individuals across the education gradient³⁸, the ability to understand and capacity to act on that information is as, if not more, important³⁹. Education has been shown to increase problem-solving skills, ability to process information and locus of control³⁹. In a study of national US and UK data, cognitive ability stemming from greater education rather than as a latent trait explained 5-30% of the education gradient for a range of health behaviours including smoking, obesity, heavy drinking⁴⁰. Locus of control has been associated with greater wellbeing, and individuals with higher socioeconomic status, including higher education levels, have greater locus of control and better self-rated health and mental health⁴¹. Other studies have found locus of control and problem solving explained in part the relationship between low education and greater physical inactivity^{42,43}. In emerging adulthood, as young men assume more responsibility for making decisions about health and lifestyle, lower locus of control, and decreased health knowledge because of early exit from education may influence their capacity to make healthier choices. Additionally, social network and peer influences on health behaviours including smoking, alcohol use, body weight and physical activity have been widely reported in adolescents⁴⁴. Early exit from high school also potentially exposes young people to different peer groups which may engage in more risk behaviours³⁷.

Educational attainment also influences employment opportunities, occupational status, income and wealth, which in turn have consequences for health. Individuals with higher incomes are better able to afford health-enhancing aids such as fitness club memberships³⁷. They are also potentially more

risk-averse with respect to their health as they may perceive they have more to lose in terms of future wealth and wellbeing by engaging in risky behaviours ³⁹. Moreover, it has been suggested that those with higher educational attainment develop expectations of increased income in the future, and thus may have a subjective perception of higher socioeconomic status. Subjective perception of higher socioeconomic status has been linked to better health and fewer health risk behaviours in middle-age adults ⁴⁵ and in adolescents ⁴⁶. Thus, early exit from education may diminish opportunities for, and the subjective perception of, improved socioeconomic status in the future, leading young men to choose risk behaviours rather than safeguard future wellbeing.

During the emerging adulthood life stage, young men are making important transitions into adulthood and the success or otherwise of these transitions can have lasting effects on their future socioeconomic prospects, relationships, and social capital as well as their health and longevity. Poorer mental health and higher levels of harmful alcohol use, smoking and illicit drug use associated with lower educational attainment in this group of young men may impact on their ability to successfully negotiate those transitions and thereby lead to further socioeconomic and health disadvantage in later life. The Lancet commission on adolescent health noted that in high income-countries the benefits of education had been found to be greater for women than men for a number of health conditions ¹, however this study suggests that substantial health benefits may also accrue for young men with completion of secondary education.

We did observe a strong effect of area SES in unadjusted analysis that is consistent with the broader literature on SES and mental health and health behaviours. What is interesting is that when an individual level characteristic was introduced, that association was no longer significant. Area-level and individual-level socioeconomic factors are not orthogonal, and the intersections between them are not unidirectional whereby area factors determine individual factors or vice versa. Rather they are complexly interrelated. This study found that for emerging adult men an individual level marker of socio-economic status is more salient than an area-level indicator for mental health, alcohol and

substance use, yet we cannot elucidate the reasons for this relationship. To begin to unpack the interactions between individual behaviours, area characteristics and their roles in the pathways to poorer health outcomes future studies may benefit from drawing on theoretical frameworks, for example syndemic frameworks. The syndemic framework takes a multifactorial approach to disease, examining interactions between diseases and/or health behaviours that cluster and includes structural factors such as social determinants⁴⁷. As such, they may offer a useful framework for designing future studies and analyses to identify the multiple, complex and overlapping causal relationships between area-level and individual-level socioeconomic characteristics, health behaviours and health outcomes. Qualitative research examining the complexities of personal context, behaviours and choices which influence health behaviours would provide valuable information for developing such frameworks.

Limitations

This study has some limitations. Data were captured by self-report which might have been less reliable than objective measures, for example clinical assessments. We examined only two socioeconomic indicators which, while widely used, cannot capture the full gamut of socioeconomic factors which impact on health. In generalizing these findings, the relatively low response rate should be taken into consideration. Consistent with national data⁴⁸, we found that participants identifying as Indigenous have high levels of disadvantage, however there were too few Indigenous Australian's in the current sample to analyse separately. Further research is required to investigate if the associations between individual- and area-level markers of socioeconomic status and a range of health outcomes and behaviours are relevant to young Indigenous men. Finally, while we have focused our discussion of the findings on the health benefits of higher educational attainment, there is also a body of research investigating the influence of health on poorer educational attainment. It is a limitation of this study that it is based on cross-sectional data and therefore cannot identify causal directions, particularly between Year 12 non-completion and mental health and behavioural factors. Young men with mental health problems, for example, may be more likely to not complete their education. Future analyses of

the cohort with subsequent waves of data will be better able to detect patterns of onset and course of health problems and risk behaviours. Another limitation of the cross-sectional design is that we cannot track the longer-term association of socio-economic characteristics and mental health, suicidal behaviour and substance use. Young men may relocate to more or less disadvantaged areas as they age, and the effects of those changes in environment on the course of their health behaviours and health status may become more salient than their individual level of educational attainment later in life. Longitudinal data are required to investigate those associations, and future Waves of the study will be able to address them. Finally, Ten to Men only gathered data on males, and as there is a similar paucity of data on socio-economic factors and health and wellbeing of women at this life stage, it would be of considerable interest to examine the relative influence of individual-level and area-level characteristics on young women's health status.

CONCLUSIONS

Studies of young men in emerging adulthood are scant, and those which consider socioeconomic factors rarer still, leaving much still to be learned about the role of social determinants of health at this important life-stage. This study is the first we are aware of that examines the relative salience of area-level and individual level socioeconomic characteristics in this population. Our finding that individual level characteristics – in this case completion of High School education – is associated with poorer mental health, substance use and suicidal outcomes in young men irrespective of the socio-economic advantage or disadvantage of the area in which they live. This is important because it provides an indication of where preventive efforts and resources might be most effectively targeted.

Our findings suggest two broad approaches that may yield benefits for young men as they approach emerging adulthood. Firstly, developing strategies to retain adolescent men in education until high school is completed such as academic support, peer programs and pastoral care. Moreover, as research shows that boys begin to disengage from education often by late primary school⁴⁹, efforts need to begin early and need to include schools providing educational opportunities that go beyond the

standard curriculum. Another approach may be to develop health promotion programs and services targeting those who have left school early such as health programs based at sporting clubs or in vocational training.

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Title:

Socioeconomic Disadvantage, Mental Health and Substance Use in Young Men in Emerging Adulthood

Date:

2019-06-22

Citation:

Currier, D., Patton, G., Sanci, L., Sahabandu, S., Spittal, M., English, D., Milner, A. & Pirkis, J. (2019). Socioeconomic Disadvantage, Mental Health and Substance Use in Young Men in Emerging Adulthood. BEHAVIORAL MEDICINE, 47 (1), pp.31-39.

<https://doi.org/10.1080/08964289.2019.1622504>.

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