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Sex differences in psychological distress, behavioural and emotional problems, and substance use in young people in out-of-home care

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Abstract

The aim of the study was to examine sex differences in self-reported psychological distress, behavioural and emotional problems and substance use in young people living in out of home care (OoHC). One hundred and seventy six young people aged 12-17 years (females 53.4%) in OoHC in metropolitan Melbourne, Australia were interviewed. Participants completed self-report measures: Kessler Psychological Distress Scale (K10), Strengths and Difficulties Questionnaire (SDQ), and the World Health Organization Alcohol, Smoking, and Substance Involvement Screening Test – Youth Version (ASSIST-Y). Girls had more OoHC placement instability over the past year compared to boys (*p*=.019). Compared with boys, the girls had significantly higher levels of distress (*p*<.001), higher SDQ total difficulties score (*p*=.007); were more likely to have self-reported emotional symptoms (*p*<.001) and peer relationship problems (*p*=.043); and to be using sedatives (*p*=.004). Girls had more psychological distress, behavioural disturbance and sedative abuse; placement instability might contribute to these problems. Greater integration across OoHC, mental health and substance use sectors is required. Girls in OoHC may benefit from interventions targeting problems with peer relationship and substance use, and supporting prosocial behaviour; such targets may reduce distress and emotional symptoms and possibly prevent longer term problems.

Abstract: 194 words

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Background

Young people can be removed from their homes and placed in out-of-home care (OoHC) due to concerns regarding safety and the risk for harm (Cummins et al., 2012). In Australia, foster care is provided in the private home of a substitute family receiving payment intended to cover the child's living expenses. Kinship care occurs in the home of a caregiver who is a family member or has a pre-existing relationship with the child; minimal financial support is provided to such carers. Residential care is provided in community-based residential homes by workers on a paid rostered or shift-work basis (Cummins et al., 2012). The majority of young people are in home-based care (foster or kinship care) and have been in care for two or more years (68%) (Australian Institute of Health and Welfare, 2018). In 2017, 47,915 Australian young people were in OoHC (Australian Institute of Health and Welfare, 2018).

Young people in OoHC are a disadvantaged group susceptible to health, psychological and behavioural problems. These problems occur in the context of early maltreatment, emotional deprivation and disrupted attachments; factors contributing to acute and chronic trauma and loss experiences (Simms et al., 2000). These presenting problems can be compounded by care system impairments, including placement breakdowns, multiple caregivers, exposure to substance use, offending and sexual exploitation. Young people with combinations of these adverse experiences are at risk of persistent or longer-term social and psychological problems (Commission for Children and Young People, 2015).

Young people in OoHC are more likely than other young people from a similar socioeconomic background to have developmental disorders, chronic psychiatric disorders and serious emotional disturbance (Yampolskaya et al., 2016). An Australian study of 547 4-11 year olds in OoHC in New South Wales, reported extremely poor mental health and socialisation relative to normative data (Tarren-Sweeney and Hazell, 2006). Based on scores on the Child Behaviour Checklist (CBCL), children were found to have significantly high scores on syndrome scales of Social Problems, Thought Problems, Attention Problems, and Rule-Breaking Behaviour. In a separate Australian study of 326 6-17 year olds in OoHC, 61.0% of young people had clinically significant behavioural problems (Child Behaviour Checklist, CBCL) and 6.7% of 13-17 year olds reported suicidal ideation and behaviour during the previous 12 months (Sawyer et al., 2007).

It is important to consider psychological, behavioural, and substance use problems in the context of sex differences. There can be sex and gender differences in rates and susceptibility to mental health disorders (World Health Organisation, 2001). Differential exposure to risk factors may also correlate with divergent mental health outcomes for boys and girls (World Health Organisation, 2001). As such, different treatment strategies may be needed for boys and girls with mental health problems (World Health Organisation, 2001). In general population studies, sex differences in youth have been noted for distress, behavioural and conduct problems (Cohen et al., 1993). The 22 country Health Behaviour in School-aged Children study (HBSC) showed poorer self-esteem and self-reported health amongst girls (Currie et al., 2012). However, the Australian Child and Adolescent Survey of Mental Health and Wellbeing indicated that boys were more likely to have had a mental disorder in the previous 12 months (Lawrence et al., 2015).

Only a few studies have examined sex differences in OoHC. Boys have more severe behavioural and emotional problems in various foster care settings (Tarren-Sweeney and Hazell, 2006). Hornick et al. (1989) found more problems on the CBCL for girls in residential and foster care. Similarly, Harpin et al. (2013) reported greater self-reported mental distress in girls in a large population-based study of OoHC in Minnesota. No sex differences on the CBCL have also been noted (Heflinger et al., 2000).

Apart from discrepant findings, there are a few limitations with the previous studies. First, Australian-based data are limited and are now over 10-years old; there may be changes in service provision and risk factors associated with poor outcome in OoHC. Second, studies have often comprised cohorts with wide age ranges. Such studies do not necessarily consider that the cognitive and emotional development and social expectations of those under 10 years are different to those 15-years or older. There may be also varied risk factors associated with poor mental health outcomes for boys and girls at different ages. Third, although care characteristics (e.g., home-based vs. residential care, age first placed) have been examined with respect to general outcomes of those within OoHC (e.g., Damnjavovic et al., 2011), it is unclear whether they contribute to sex differences in outcome. Finally, studies have generally relied on guardian/carer ratings of internalising and externalising behaviours; guardian/carers ratings of mental health problems are often more severe than reported by the young people (Mount et al., 2004).

Despite the importance of considering whether there are sex differences in experiences and outcomes of those in OoHC, it is surprising that research is scant. Thus, the purpose of this study was to provide recent and comprehensive data on sex differences in OoHC in Australia, in terms of youth demographic characteristics, care characteristics, self-reported psychological distress, emotional and behavioural problems and substance use. We also aimed to determine whether sex differences in outcomes could be explained by age (12-14 years) and care type (home-based vs residential care).

Methods

Participants and settings

Data was collected as part of the X study (REF). X was a controlled pragmatic trial of a complex mental health intervention for 12-17 years olds in OoHC in Melbourne Australia, involving carers, case managers and community service organisations. Recruitment was conducted through three mainstream community service organisations and one indigenous specific community service organisation operating in shared regions (REF). A census of these community service organisations in August 2014 of these participating agencies found that 322 young people were in OoHC at that time (REF).

Young people who were in the care of any one of these agencies, either identified during or after the census period were eligible to participate in the study. Interviews occurred between 2014-2015. The cohort was derived largely based on convenience sampling.

Measures

Data presented here relates to the baseline assessment from the pragmatic trial. Demographic variables included age, sex, education and vocational statuses, cultural and linguistic diversity. Care characteristics included care type (foster, kinship, residential care), age placed in care, length of time in care, the number of placements over the previous year and lifetime.

The Kessler Psychological Distress Scale (K10) was used a measure of self-reported psychological distress over the past four weeks. It comprises 10 items (each item is on a scale 1 ‘none of the time’ to 5 ‘all of the time’. Total score ranges from 10 to 50; higher scores depict more severe distress. Guidelines for interpreting five categories of K10 total scores were: 10-15 ‘low distress’; 16-21 ‘moderate distress’; 22-29 ‘high distress’; 30-50 ‘very high distress’ (Australian Bureau of Statistics, 2012). For our cohort, Cronbach’s alpha (α) for the K10 was 0.91.

The Strengths and Difficulties Questionnaire (SDQ, Goodman, 1997) is a validated 25-item behavioural screening measure. Each item is scored on a scale - 0 ‘not true’ to 2 ‘certainly true’. It comprises five subscales each with 5 items (scores ranging 0-10): *emotional symptoms* (e.g., “Many worries, often seems worried”); *conduct problems* (e.g., “Often fights with other children or bullies them”); *hyperactivity/inattention* (e.g., “Easily distracted, concentrations wanders”); *peer relationship problems* (e.g., “Picked on or bullied by other children”); and *prosocial behaviour* (e.g., “Considerate of other people’s feelings”). With the exception of prosocial behaviour, higher scores indicate problematic behaviour. The first four subscales are summed to provide a total difficulties score. A total difficulties score ≥17 indicates clinically problematic behaviour that necessitates intervention (Hayes, 2007).

For our study, the Cronbach's α for the SDQ total difficulties was 0.83 and for the five subscales ranged from 0.54 (peer relationship problems) to 0.76 (emotional symptoms).

Data on substance use was collected using the WHO Alcohol, Smoking, and Substance Involvement Screening Test – Youth Version (ASSIST-Y; South Australia Health, 2012). The ASSIST-Y has cut-off scores to depict levels of risk lowered for youth populations. Two forms of the ASSIST-Y: (i) 10-14 year olds; and (ii) 15-17 year olds were used. Both versions cover nine substances. Questions covered lifetime use (Q1), use in past three months (Q2), use away from social situations (Q3), problems arising from substance use (Q4, e.g., health, relationships, school or with the police), impacts on activities of daily living (Q5), levels of concern expressed by friends or relatives about drug use (Q6), and intravenous drug use (Q7). As instructed in the manual (ASSIST-Y; South Australia Health, 2012), a total substance involvement score is calculated by summing Q2 through to Q6 (except for tobacco which is scored as Q2+Q3+Q4+Q6). Moderate-high risk is determined by pre-established cut-offs differing by age group. We report rates of lifetime use (Q1) and the percentage of cases falling into moderate-high risk categories (based on total substance involvement score).

Procedure

Ethics approval was granted by The X Human Research Ethics Committee (1340674). The Victorian Department of Human Services Research Coordinating Committee also endorsed the project.

Research assistants were trained in interviewing skills required to engage young people who were vulnerable, had likely experienced trauma and came from different cultural backgrounds. Each research assistant worked with community service organisations case managers to identify young people eligible for the study (either from the census or post-census). Case managers then contacted the young person and their carer, seeking permission for a research assistant to make contact to discuss the study. On gaining permission, the research assistant arranged a face-to-face meeting at a preferred location with the young person and their carer. Prior to the interview, research assistants sought informed consent for both young people and their carers, outlining the voluntary nature of the study and participants' privacy and confidentiality. Assent was obtained from a parent or legal guardian for young people under the age of 16. Research assistants conducted face-to-face interviews with young people and carers separately, comprising self-report and semi-structured interview questions. The interviews took about an hour to complete. Consenting youth were reimbursed $30 for participation.

Data analysis

Statistical analyses were conducted using IBM® SPSS® Statistics Version 22. One sample *t*-tests and chi-square (χ^2) tests were conducted to determine cohort representativeness compared to previous census data (REF) in terms of age, sex, and care type characteristics.

A series of logistic regression model were conducted with sex as the dependent variable (girls coded as 1), and the individual demographic, care characteristics and clinical variables as the independent variables. From these models, odds ratios (*OR*) and the 95% confidence intervals (CI) of the *OR*s were reported. Interpretation of *ORs* was done in accordance to guidelines specified by Borenstein et al. (2009): 1.43 small, 2.48 medium and 4.27 large effects. The Wald statistic (χ^2) was used to determine the significance of the associations. Because of the potential impact of age, these regressions were not only run based on the total cohort, but were conducted separately for the two age groups (12-14, 15-17 years). Similarly, the analyses were conducted separately for those in home-based and residential care.

Multivariate logistic regression was used to determine which factors best differentiated boys and girls. There were four steps within this model. Age was entered into the first step. The second step comprised variables related to care characteristics and the third step contained emotional and behavioural variables. The final step in the model comprised substance use variables. Choice of variables to include in each of the steps was largely governed by bivariate associations at p<.10 level, although there was some discretion adopted in variable choice. From this model, we were able to determine the significance of each step, the change between steps, as well as the fit of the final model.

Results

Demographic characteristics

176 young people from OoHC were interviewed (*M*=14.9 years, *SD*=1.5); 53.4% (*n*=94) were female. The interviewed cohort did not differ significantly in age (*t*(175)=0.13, p=.899) and sex ($\chi^2(1)=0.02$, *p*=.880) distributions from the census population (REF).

Around 80% were currently in school (see Table 1). Very few (<15.0%) were in paid employment. Nearly 90.0% were born in Australia, and 20.6% had an Indigenous heritage. There were no sex differences on any of these demographic variables.

(Insert Table 1 about here)

Care characteristics

Most young people were in residential care, followed by foster and kinship care (see Table 2). There was a significant difference between care characteristics of the interviewed cohort compared to the census sample ($\chi^2(1)=13.13$, *p*<.001); with significantly less young people in kinship care recruited to interview, *z*=3.16, *p*<.001.

The average age of entry to care was 8.9 years (*SD*=4.8). The length of time in care varied from 1 to 180 months (*M*=30.6, *SD*=41.2). The number of placements over the previous year ranged from 1 to 20 (*M*=1.8, *SD*=2.0) and the number of lifetime placements ranged from 1 to 75 (*M*=5.3, *SD*=7.3). Most had only one placement in the previous year; however, 34.1% *(n*=59) had two or more. For most care characteristics, there were no significant sex differences; however, girls (22.6%, *n*=21) were 2.13 times more likely than boys (8.8%, *n*=7) to have had three or more placements over the past year, Wald χ^2=5.52, *p*=.019.

(Insert Table 2 about here)

Psychological distress

The K10 was available for 171 young people. Girls had a significantly higher average total K10 score compared to boys, *OR*=1.09, 95%CI of *OR* [1.04, 1.13], Wald χ^2=15.53, *p*<.001 (see Table 3). On examination of the K10 distress categories, boys (37.2%, *n*=29) were 1.93[1] (95% CI of *OR* [1.14, 3.27] times more likely to have moderate distress than girls (23.7%, *n*=22), Wald χ^2=6.01, *p*=.014. Conversely, girls (31.2%, *n*=29) were 3.96 (95% CI of OR [1.86, 844]) times more likely than boys (6.4%, *n*=5) to fall into the very high distress category, Wald χ^2=12.67, *p*<.001. These analyses were then conducted separately for each age group. Girls aged 15-17 years (*M*=20.7, *SD*=9.2) had a higher average K10 score compared to boys (*M*=20.7, *SD*=9.2) in the same age range, *OR*=1.12, 95%CI of *OR* [1.06, 1.18], Wald χ^2=15.85, *p*<.001. Similarly, girls aged 15-17 years (37.7%, *n*=23) were 5.28 (95% CI of OR [2.02,

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[1] For ease of interpretation of this odds ratio, sex was rated as male=1 and female=0

13.80]) times more likely to have very high distress compared to boys (6.0%, *n*=3) in this age group, Wald χ^2=11.54, *p*=.001. No such sex differences were noted in the 12-14 year age group.

Sex differences in distress across care types were also examined. Because of the few cases in kinship care (*n*=7 males in this care), categories in were collapsed into a dichotomy of home-based (foster and kinship care) versus residential care. There were no sex differences in the home-based care on the K10. Girls in residential care (*M*=29.0, *SD*=1.4) had significantly higher distress than boys in residential care (*M*=18.1, *SD*=1.3), *OR*=1.19, 95%CI of *OR* [1.10, 1.30], Wald χ^2=17.47, *p*<.001. Girls in residential settings were 7.98 (95% CI of OR [2.39, 26.68]) to have very high distress than boys in residential settings, Wald χ^2=11.38, *p*<.001

(Insert Table 3 about here)

Behavioural and emotional problems

Girls had a significantly higher mean total difficulties score than males, *OR*=1.07, 95%CI of *OR* [1.02, 1.12], Wald χ^2=7.37, *p*=.007; nearly 50% of girls (47.9%, *n*=45) had a score in the clinically significant range (see Table 4). Girls also had significantly higher mean scores on SDQ subscales: emotional symptoms, *OR*=1.46, 95%CI of *OR* [1.26, 1.68], Wald χ^2=26.59, *p*<.001; peer relationship problems, *OR*=1.17, 95%CI of *OR* [1.01, 1.36], Wald χ^2=4.11, *p*=.043; and prosocial behaviour, *OR*=1.38, 95%CI of *OR* [1.17, 1.64], Wald χ^2=14.28, *p*<.001.

The above analyses were then re-run separately for each age group. Girls in the 15-17 years age group (*M*=17.6, *SD*=7.3) had a significantly higher SDQ total difficulties average score than males (*M*=13.6, *SD*=5.6) in the same age group, *OR*=1.10, 95%CI of *OR* [1.03, 1.16], Wald χ^2=8.72, *p*=.003. Self-reported emotional problems were more common in girls in both the 12-14 years, *OR*=1.42, 95%CI of *OR* [1.11, 1.82], Wald χ^2=7.85, *p*=.005, and 15-17 year age groups, *OR*=1.48, 95%CI of *OR* [1.24, 1.76], Wald χ^2=18.65, *p*<.001. Self-reported conduct problems were more common in boys in the 12-14 year age group, *OR*=0.79, 95%CI of *OR* [0.62, 0.99], Wald χ^2=4.15, *p*=.042. Prosocial behaviour was stronger in girls in the 12-14 years, *OR*=1.72, 95%CI of *OR* [1.19, 2.48], Wald χ^2=8.48, *p*=.004, and 14-17 years age groups *OR*=1.28, 95%CI of *OR* [1.06, 1.55], Wald χ^2=6.35, *p*=.012.

Girls in a residential setting had a higher average SDQ total difficulty score than boys in a residential setting, *OR*=1.17, 95%CI of *OR* [1.08, 1.28], Wald χ^2=12.93, *p*<.001. Also evident in girls in a residential setting were more severe emotional problems *OR*=1.99, 95%CI of *OR* [1.50, 2.65], Wald χ^2=22.47, *p*<.001 and more severe peer problems, *OR*=1.42, 95%CI of *OR* [1.10, 1.84], Wald χ^2=7.19, *p*=.007. Better prosocial behaviour was observed in girls than boys in home-based, *OR*=1.38, 95%CI of *OR* [1.03, 1.85], Wald χ^2=4.68, *p*=.031, and residential care, *OR*=1.34, 95%CI of *OR* [1.09, 1.66], Wald χ^2=7.37, *p*=.007.

Substance use

Figure 1 depicts sex differences in lifetime substance use (*n*=173). Girls reported significantly more lifetime use of sedatives than boys, *OR*=1.84, 95%CI of *OR* [1.22, 2.78], Wald χ^2=8.49, *p*<.001. Boys in 12-14 year age group were significantly more likely to report lifetime use of tobacco and cannabis than girls in this age range (tobacco, boys 55.2% *n*=16, girls 28.1%, *n*=9, *OR*=0.54, 95%CI of *OR* [0.33, 0.96], Wald χ^2=4.47, *p*=.035; cannabis, boys 51.7% *n*=15, girls 25.0% *n*=8, *OR*=0.56, 95%CI of *OR* [0.33, 0.96], Wald χ^2=4.47, *p*=.034. In the 15-17 year age range, girls (37.7%, *n*=23) were more likely to report lifetime use of sedatives than boys (13.7%, *n*=7), *OR*=1.96, 95%CI of *OR* [1.21, 3.14], Wald χ^2=7.59, *p*<.001. Girls (59.5%, *n*=22) in residential care were significantly more likely to report lifetime use of sedatives compared to boys (15.9%, *n*=7), *OR*=2.78, 95%CI of *OR* [1.66, 4.69], Wald χ^2=14.87, *p*<.001.

(Insert Table 4 about here)

Table 4 comprises the percentage of cases in low, moderate and high risk categories of use. 46.8% (*n*=81) of young people reported tobacco usage that placed them in clinical high risk category. A total of 32.1% (*n*=40) reported high risk cannabis usage. For tobacco use, boys were significantly more likely to be in moderate risk category, *OR*=0.37, 95%CI of *OR* [0.18, 0.74], Wald χ^2=7.79, *p*=.005, and girls were more likely to be in the high risk category *OR*=1.78, 95%CI of *OR* [1.16, 2.89], Wald χ^2=5.51, *p*=.019. The risk categories were not examined by age and care type because of the low numbers.

Multivariate model of sex differences

The four step multivariate logistic regression was conducted. Age at interview was entered at the first step and did not add significantly over and above the constant only model, $\chi^2_{\Delta}(1)$ =0.02, *p*=.889. In the second step, the care related variables were entered and included number of placements in the past year, length of time in care (months) and care type (home-based, residential). The inclusion of these variables added significantly to the explanation of sex differences, over and above the constant and age at interview, $\chi^2_{\Delta}(4)$=11.07, *p*=.026; the overall omnibus test of the model was significant, $\chi^2(5)$=11.08, *p*=.049. The fourth step of the model comprised the emotional and behavioural measures including SDQ emotional symptoms, SDQ conduct problems, SDQ peer problems, and SDQ prosocial behaviour. The K10 was excluded because of its high correlation with SDQ emotional symptoms (*r*=.76, *p*<.001). The increase in explanatory power from the third to the fourth step was significant, $\chi^2_{\Delta}(4)$=46.22, *p*<.001, and the overall omnibus test of the model was significant $\chi^2(9)$=57.30, *p*<.001. In the final step, tobacco and sedatives lifetime use were added to the model. These variables contributed significantly to the model, $\chi^2_{\Delta}(2)$ =10.09, *p*=.006. The overall omnibus test for the final model was significant $\chi^2(11)=67.39$, *p*<.001 and the Nagelkerke R^2 was 0.46. Correct classification of cases in the model was at 76.6%. Individual predictors that significantly delineated boys from girls included more than 3 placements in the past year, SDQ emotional problems, and sedative use (see Table 5).

(Insert Table 5 about here)

Sedatives and emotional and behavioural problems in females

Point biserial correlations were conducted to determine the relationship between lifetime sedative use in girls and their psychological presentations. Overall, there were moderate significant correlations between lifetime sedative use and the K10 (*r*=.49, *p*<.001), SDQ and emotional symptoms (*r*=.37, *p*<.001), and SDQ peer problems (*r*=.41, *p*<.001). In the 12-14 year age group, these associations were stronger for K10 and SDQ emotional symptoms (K10 *r*=.50, *p*=.004; SDQ emotional symptoms *r*=.46, *p*=.004) than those obtained for 15-17 year old girls (K10 *r*=.44, *p*<.001; SDQ emotional symptoms *r*=.31, *p*=.014). Notably, there was no significant association between sedative use and SDQ peer problems in the 12-14 year olds (*r*=.23, *p*=.201), whereas in 15-17 year olds there was a significant moderate correlation (*r*=.44, *p*<.001). No such associations were found for boys either overall or within the two age groups.

Discussion

Although sex differences have been noted in the general community regarding mental health and behavioural problems (World Health Organisation, 2001, Cohen et al., 1993, Currie et al., 2012, Lawrence et al., 2015), research on this issue is worryingly sparse in the OoHC sector. Our study is important for highlighting that not only are young people in OoHC at greater risk for poor outcomes, there are sex differences in self-reported psychological distress, behavioural and emotional disturbance, and substance use. Understandably these issues are complex, but they need to be put on the agenda in order for successful prevention and intervention.

We had a sizeable sample of youth aged 12-17 years living in OoHC care in Victoria, Australia. The cohort was representative of the age and sex distributions found in the previous census of this population (REF); however, comprised significantly fewer young people from kinship care. Comparing the cohort to 2016 Australian data on OoHC youth (Australian Institute of Health and Welfare, 2018), we also had an overrepresentation of younger people in residential care. The cohort was less likely to be attending school (20% vs ~<10% non-attendance) (Australian Curriculum Assessment and Reporting Authority, 2017)) and had a higher representation of those from an Indigenous background (20% vs ~3%) (Australian Bureau of Statistics., 2013) than the general population. Given these young people were more likely to be young and in residential care, to be less likely to engaged in education, and were more likely to be Indigenous, then they are likely to be vulnerable to poor mental health outcomes.

Self-reported psychological problems were more severe and occurred at higher rates in girls compared with boys; especially girls aged 15-17 years and those in residential care. These findings are consistent with previous research: rates of these problems are higher in young people from OoHC than in reference populations (Harpin et al., 2013, Simms et al., 2000), especially in girls (Hornick et al., 1989, Harpin et al., 2013, Keller et al., 2010); and that internalising behaviours in are more commonly seen in girls than boys (Neely-Barnes and Whitted, 2011).

Girls had more peer problems than boys. Leve et al. (2007) found the psychological distress and emotional problems in girls results in social withdrawal, and in turn, peer problems. Positive peer relationships can be protective for young people who have experienced maltreatment and trauma (Bolger et al., 1998), so sex specific interventions to promote such relationships may lead to better outcomes (Leve et al., 2007).

Closely tied to engagement with peers is prosocial behaviour. Although girls in this study described peer problems, they were more likely to engage in prosocial behaviour (e.g., help others); a finding supported by previous research (Marquis and Flynn, 2009). Goemans et al. (2016) found that several care characteristics can promote prosocial behaviour: including a stable home environment, kinship care placement, and the absence of offspring of the foster parents. Interestingly, girls in our sample were more likely to exhibit prosocial behaviour despite experiencing more placement instability.

In our study, consistent with broader community epidemiological findings (Lawrence et al., 2015), more conduct problems were reported for younger boys (12-14 years) than for girls in this age group; whereas there were no sex differences in the 15-

17 year age range. One reason for these findings could be that boys aged 15-17 with behavioural problems may have exited the OoHC system and entered the youth justice system (Malvaso et al., 2017). Underreporting of externalising behaviours is more prevalent in boys (Collishaw et al., 2009); this might also account for the lack of sex difference in 15-17 year olds. Conduct disorders in girls may also emerge later, so that by mid-late adolescence girls have similar rates of these problems to males (McCabe et al., 2004).

Substance use is common in OoHC (Kim et al., 2017, Keller et al., 2010) and described as reflecting substance abuse/dependence rather than recreational or experimental use (Vaughn et al., 2007). There were concerning rates of substance use in this cohort, with lifetime rates of alcohol, tobacco, cannabis and amphetamine use at 69.4% (n=120), 63.0% (*n*=109), 52.6% (*n*=91) and 23.7% (*n*=41) respectively.

The difference between the sexes for lifetime illicit sedative use in this study: 30.1% (*n*=28) of girls compared with 11.3% (*n*=9) of boys is much higher than previously reported (Vaughn et al., 2007). Adolescents in foster care who abuse sedatives may be more likely to have anxiety and sleep problems (Smith, 2011). We found that sedative use was closely tied to the distress and behavioural and emotional problems experienced by girls. Whether girls are self-medicating with sedatives to help address these problems remains unclear. Further investigations of sex differences in sedative use are warranted.

As noted earlier, sex differences were found with respect to placement instability in the previous year, with girls more likely to have experienced 3 or more placements. This finding deviates from a recent meta-analysis of 42 papers that indicated that placement instability was unrelated to sex (Konijn et al., 2019). They reported that placement instability was related to the older age, the young person's behaviour problems, placement in non-kinship care, and history of maltreatment (Konijn et al., 2019). It may be speculated that the sex differences we found in placement instability in our girls was a reflection of those who were 15-17 years who had behavioural and emotional problems, greater distress, and issues with substance use. Causality, however, is difficult to ascertain. It is unclear whether the placement instability contributed to an increase in these problems or was it these problems resulting in multiple placements being required.

Limitations

A number of study limitations need to be considered. First, this was a cross-sectional study. From our data it is not possible to capture that young people may have transitory experiences with OoHC and may also enter and exit different care types. Causality also cannot be assumed. Prospective research that includes assessments either prior to or at entry into care, and regular assessments to the point of discharge, would be helpful in delineating the onset and trajectory of mental ill health and substance misuse.

Second, self-report screening tools were used to assess severity of mental health problems and substance use. We did not use standardised diagnostic tools to determine full threshold disorders. However, levels of psychological distress, emotional and behavioural problems indicate that these young people are at high risk for psychiatric disorder and diagnostic assessments may be useful in delineating appropriate treatment plans. The reliance on self-reported problems from the young people rather than informants (e.g., carers) may impact on findings. Young people tend to underreport externalising behaviours such as hyperactivity and oppositional behaviours whereas they are more reliable for describing internalising problems (Loeber et al., 1990).

Third, we had an over-representation of young people in residential care. Residential settings are often considered the ‘last resort’ for young people following multiple failed foster care placements, with challenging and high risk behaviours (Bollinger, 2017). This may contribute to the high rates of problems seen in this cohort.

Fourth, even though we had a large cohort overall, we had limited power to examine the impact of sex within subgroups. For example, we collapsed kinship and foster care into the one care type category because of low numbers in kinship care (particularly males). Although kinship and foster care fall under home-based care in Victoria, Australia (Cummins et al., 2012), there are differences between the two care types. For example, young people placed in kinship care may have increased placement stability, reduced trauma resulting from separation from relatives, increased opportunity to have placement with siblings, and less child mental health issues (Liao and White, 2014). Conversely, foster carers are provided with additional training and support, including greater community service organisations oversight and financial benefits. Sex differences in these two care types should be further explored. Other subgroups that might be of interest in examining the impact of sex on psychological outcomes in future research include indigenous and migrant groups, and those with disability.

Fifth, because of restrictions associated with institutional ethics approval, it was not possible to collect information on potential risk factors for poor mental health including childhood adversities, exposure to trauma, and attachment problems for the cohort.

Finally, we did not have comparable normative data. The second Australian Child and Adolescent Survey of Mental Health and Wellbeing reported one in seven young people in the community were found to have a mental health disorder, with a greater prevalence of problems in boys. This sex difference was largely explained by a higher rate of attention deficit hyperactivity and conduct disorders in boys (Lawrence et al., 2015). Both the survey and this study reported adolescent girls were more likely to experience major depressive disorder than younger girls or adolescent boys. Notably, the national survey applied diagnostic criteria for mental health disorders whereas we used screening tools, rendering direct comparisons between young people in OoHC and the community fraught.

Implications for clinical practice, future research and policy

Despite the clinical significance of mental health problems in young people in OoHC, there is growing evidence that young people in OoHC do not receive sufficient support for these problems (Yampolskaya et al., 2016). This is despite initiatives such as the Victorian Chief Psychiatrist's Guidelines to ensure priority access to mental health support for young people in OoHC (Vine, 2012). If the mental health and substance use problems are not addressed then significant difficulties may be encountered transitioning from OoHC care into adulthood (Kim et al., 2017). In adulthood, these young people are less likely to have their essential needs met (e.g., housing), to have neither access to basic supports (e.g., education) nor mental health and substance abuse treatments (Keller et al., 2010).

Preventive and therapeutic interventions are warranted. Early and regular monitoring of emotional and behavioural problems is essential for improving outcomes (Goemans et al., 2016); particularly for girls as they develop (Neely-Barnes and Whitted, 2011). One way to promote early intervention is to upskill stakeholders who have the most contact with young people. A recent meta-analysis has indicated that upskilling foster parents in dealing with emotional and behavioural problems results in the young people having fewer problems (Solomon et al., 2017). Providing case managers with ongoing training, support and mentorship in evidence-base practices and sensitivity to sex differences has been highlighted as important (Moore et al., 2016).

Case managers and carers should be provided psychoeducation to inform them about sex differences in behaviours and mental health. Apart from the differences described here, there can also be other considerations including sex differences in health and mental health literacy (Cotton et al., 2006), help-seeking (Liddon et al., 2018), coping and resilience (Liddon et al., 2018), and willingness to accept support (Liddon et al., 2018). Upskilling case managers and carers in these issues is especially important given that young people do not necessarily instigate help-seeking for mental health and behavioural problems (Rickwood et al., 2007).

Interventions may be tailored to consider sex differences may be also beneficial. A preventive intervention for girls in OoHC promoting healthy adjustment lowers rates of internalising and externalising problems and substance use by promoting prosocial skills (Smith et al., 2011). Targeted interventions addressing specific problems may also be useful. Interventions for substance use, in this population, for example the KEEP SAFE family-based and skill-focused program, have been found helpful for both girls and boys (Kim et al., 2017).

Placement instability could be a target of intervention and policy development. Placement instability is a driver of poor mental health outcomes in young people from OoHC (Stein and Dumaret, 2011). Placement instability occurred particularly among girls in this cohort. It remains unclear as to whether improving mental health and wellbeing of these young people improves relationships with carers and thus promotes placement security. Case workers can help minimize placement instability by ensuring appropriate matching of the young person to the carer, screening the young people for behavioural issues and stress, upskilling foster carers on how to manage such issues, provide ongoing monitoring of placement outcomes, and implementing interventions to minimize problems in a placement (Konijn et al., 2019). If there is early termination of a placement, the case worker should provide adequate support for the young person and carer to manage that transition (Zeijlmans et al., 2018)

Another area of research and clinical consideration is gender as a distinct construct to sex. In our study, we specifically examined differences in experiences and outcomes according to biological sex. However, there is evidence that sexual minorities or lesbian, gay, bisexual, transgender and questioning (LGBTQ) youth are not only overrepresented in OoHC, but are likely to experience discrimination, isolation, maltreatment and placement instability as a result of their sexual orientation (McCormick et al., 2017, Baams et al., 2019). As a result, they are likely to have greater risks related to education, substance use and mental illness (Baams et al., 2019). It would be of interest to delineate whether biological sex or gender, or the interaction between the two, increases the likelihood of poor outcomes from OoHC.

Conclusions

Among young people in OoHC aged 12-17 years, girls in the present cohort were at greater risk than boys of psychological distress, emotional symptoms and peer relationship problems and sedative use. There are complex interrelationships between these problems that in part relate to placement characteristics such as placement stability and being in residential care. The extent that these sex differences are due to differential responses to childhood adversities and trauma exposure remains unclear. There needs to be greater emphasis on prevention of and targeted interventions that considers sex differences in risk and clinical needs. Girls may benefit from interventions targeting peer relationship problems, prosocial behaviour and substance use; such interventions may reduce distress and emotional symptoms. Empowering OoHC workers and carers in supporting young people with these issues is recommended. Greater integration across OoHC, mental health and substance use sectors may be beneficial.

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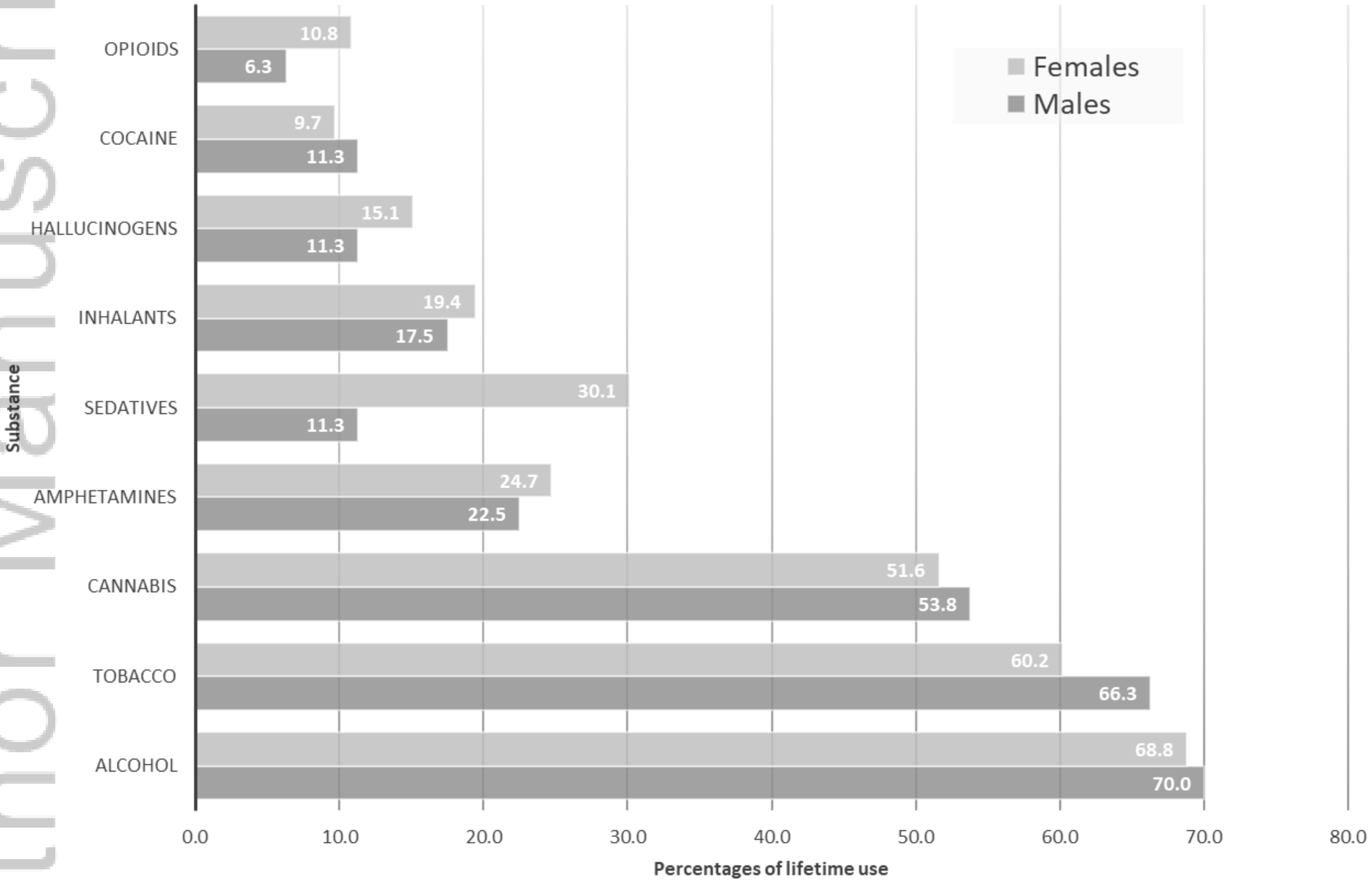

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