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Mental health, adverse life events and health service use among Norwegian youth in the child welfare system: Results from a population-based study

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Abstract

Youth within the child welfare system (CWS) have often experienced adverse life events, and many need support from health services. This study aimed to compare mental health problems and health service use among adolescents receiving in-home services (IHS), living in foster care (FC) and general population youth (GP). Data stem from the youth@hordaland survey, a population-based study of adolescents (N = 10,257, age 16–19) conducted in 2012 in Hordaland County, Norway. The adolescents provided self-reported data on CWS contact, health service use, adverse life events and multiple instruments assessing mental health problems. The IHS and FC groups had significantly higher symptom scores across most mental health measures than peers from the GP. Youth receiving IHS had significantly higher scores on measures of general internalizing and externalizing problems, attention deficit hyperactivity disorder (ADHD) and depression compared with peers in FC. Those receiving IHS reported the highest health service use. Adverse life events accounted for a substantial part of the differences between the groups. Mental health problems are frequent among older adolescents within the CWS, especially among youth receiving IHS. Service providers and policymakers should be aware of the present and likely continued challenges faced by many of these youth.

KEYWORDS
adolescence, adverse life events, child welfare, health services, mental health, youth

1 | BACKGROUND

Children exposed to poverty, inadequate parenting or maltreatment are at risk of mental health problems (Bøe et al., 2017; Khan et al., 2015; Maclean et al., 2019; McLeod & Shanahan, 1993). Youth receiving interventions from the child welfare system (CWS) have often experienced such adversities (Conn et al., 2015). Numerous studies suggest that youth within the CWS display higher levels of mental health problems during childhood and later adult years than peers from the general population

(Côté et al., 2018; Green et al., 2020), and it has been estimated that about 49% meet the criteria for a mental disorder (Bronsard et al., 2016). Moreover, former child welfare clients are at high risk for suicide attempts and severe psychiatric morbidity (Brännström et al., 2020; Vinnerljung et al., 2006), highlighting the potentially severe consequences of adverse childhood conditions experienced by many CWS clients.

Youth receiving interventions from the CWS may be placed in out-of-home care (i.e., residential, kinship or foster care [FC]) or reside with their biological parents while being provided some form of in-home services (IHS). In Norway, as in other Western countries, most children and youth receive IHS with the aim of preventing the need for out-of-home placements such as FC (see Kojan & Lonne, 2012; Mennen et al., 2010; Tonheim & Iversen, 2019).

Youth receiving IHS compared with living in FC likely differ in the timing, severity and persistence of exposure to adverse circumstances. Those receiving IHS risk continued exposure but are spared the potential trauma of rupture from their biological family (Campbell et al., 2012). On the other hand, FC youth have often faced more severe adversities before placement, must adapt to a new home and risk further instability due to placement breakdowns (Minty, 1999). At the same time, they are given the opportunity to form bonds with new parental figures, which ideally foster positive developments, and youth in FC appear to be at lower risk of repeated maltreatment (Campbell et al., 2012; Goemans et al., 2016). Still, a recent meta-analysis of longitudinal studies found few improvements in mental health during their stay in FC (Goemans et al., 2015). This may indicate that the traumatic experiences endured and mental health problems present in many of these children hinder positive developments after being placed in more favourable environmental circumstances (Marinkovic & Backovic, 2007).

Findings from existing studies are mixed regarding differences in mental health among children and youth receiving IHS compared with those in FC. Some studies find better adjustment among those receiving IHS (e.g., Heflinger et al., 2000), whereas others suggest that youth in FC display lower levels of psychopathology (e.g., Janssens & Deboutte, 2010). A recent systematic review and a meta-analysis documented few differences in mental health problems between the groups (Goemans et al., 2016; Maclean et al., 2016). For instance, no statistically significant differences in cognitive functioning, adaptive functioning, or internalizing and externalizing problems were detected (Goemans et al., 2016). However, children and youth with out-of-home placements were found to use more services, perhaps reflecting differences in needs, referral rates or responsiveness from caregivers (Maclean et al., 2016). Still, many of the included studies were small sample studies from the United States. It is uncertain whether these results generalize to other contexts.

Previous research has often used composite measures of mental health problems such as total behaviour problems, internalizing problems (including symptoms of emotional problems, anxiety, depression, peer problems and social withdrawal) and externalizing problems (e.g., conduct or antisocial problems, and hyperactivity) (see Goemans et al., 2016). Such measures may obfuscate nuances in symptoms profiles and could also be one reason for the few identified differences in mental health problems between youth receiving IHS compared with living in FC.

1.1 | The Norwegian context

The CWS in Norway resides within a welfare state model providing universal services to its citizens (Tonheim & Iversen, 2019). The outreach of the Norwegian CWS is extensive (Burns et al., 2017), and almost 3% of all children and youth receive interventions each year (Statistics Norway, 2018a). Among older adolescents, approximately 5% of males and 4% of females aged 16–19 received some form of intervention from the CWS in 2018 (Statistics Norway, 2018a). About 60% of children and youth within the CWS remain with their biological parents while receiving IHS (Seip et al., 2018). IHS includes various services, such as parent counselling, financial support and leisure time activities (Kojan & Lonne, 2012). Of those with out-of-home placements, nearly 80% are placed in FC (Seip et al., 2018). Placements tend to occur late in childhood, and approximately 56% are between 13 and 18 years old at the time they are first placed out of home (Backe-Hansen et al., 2014). On average, families receive voluntary IHS more than 3 years before children are placed (Christiansen & Anderssen, 2010). Child neglect has been identified as the main reason for out-of-home placements in Norway (Clausen, 2000), and children receiving IHS or placed in FC more often have parents with low educational qualifications and income and parents with mental health problems than general population children (Christiansen et al., 2019; Seip et al., 2018).

Norway holds a strong policy that individuals should receive services according to their needs (Norheim et al., 2014). The school health services and adolescent health clinics exist as easily accessible services that adolescents can contact at their convenience free of charge. Access to specialist health services, including mental health services for adolescents, generally needs referral from the general practitioner. The general practitioner thus functions as a vital gatekeeper for specialized mental health care.

Previous studies from Norway have found that children and youth receiving IHS or who are placed outside their home display more mental health problems than peers from the general population (Havnen et al., 2009; Iversen et al., 2007). Studies have also documented a high prevalence of mental disorders among children and youth in FC, and it has been estimated that about 50% meet the criteria for one or more psychiatric disorders (Lehmann et al., 2013; Lehmann & Kayed, 2018). A study further found great variability in mental health adjustment over time among children and youth in FC (Havnen et al., 2014). Despite this, a recent study found that only 31% had been in contact with the mental health services for children and youth during the last 2 years, suggesting an underutilization of mental health services in this group (Larsen et al., 2018).

1.2 | The present study

Within a Nordic context, this study aimed to assess and compare several domains of mental health and health service use among youth receiving IHS, those placed in FC and youth from the general population. We investigate both general measures of internalizing and externalizing problems, and more specific measures of depression, anxiety, obsessive–compulsive disorder (OCD), attention deficit hyperactivity disorder (ADHD) and perfectionism. Most studies have compared FC with IHS, or FC or IHS with children from the general population. Limited research has been conducted on all three groups simultaneously. Previous studies have also investigated rather broad age groups or young children, often on small samples. Less is known about the adjustment among older adolescents within the CWS (see Goemans et al., 2016). Mental health problems often debut during adolescence (De Girolamo et al., 2012) and are related to important functional impairments, including high school dropout and reduced later work–life participation (Freudenberg & Ruglis, 2007). As older adolescents are on the verge of entering adulthood and leaving the CWS, studies exploring their mental health and health service use during this important transitional period are needed.

Based on the above considerations, we hypothesized that youth in contact with the CWS would have more mental health problems and higher service use than adolescents from the general population. Due to mixed findings of previous research, no directional hypothesis was made for potential differences between youth receiving IHS and living in FC.

2 | METHODS

2.1 | Design and procedure

Data stem from the population-based youth@hordaland study of adolescents in Hordaland County in Western Norway conducted during spring 2012. All adolescents born between 1993 and 1995 were invited to participate (N = 19,439), whereby 10,257 agreed, yielding a participation rate of 53% Information about the study was administered to adolescents by e-mail, and one school hour was allocated to complete the electronic questionnaire. Information about the study was sent by post to those not in school, and alternative solutions were made for students in hospitals or institutions. The adolescents consented to participate, as Norwegian law states that youth aged 16 years and older decide matters of consent on health issues themselves. Parents or guardians received information about the study in advance.

Official data show that in 2012, 3.9% of youth in Hordaland County aged 16–19 received some form of intervention from the CWS (Statistics Norway, 2018a). This is slightly higher than the proportion of youth with CWS contact identified in the present study (3.1%). At the time of the study, Hordaland was considered representative of Norway with regards to gender, household income and rural/urban residence distribution (Statistics Norway, 2018b). Official statistics show that 92% of all adolescents in Norway aged 16–19 attended high school, compared with 98% in the current sample.

2.2 | Instruments

2.2.1 | Sociodemographic characteristics

We obtained gender and date of birth from the adolescents' identity number in the Norwegian national population registry. Exact age was calculated from the date of participation and date of birth.

Ethnicity was based on self-reported country of origin (themselves and their parents) and categorized as 'Norwegian' or 'foreign' born.

Maternal and paternal education were reported separately by the adolescents, using the options 'elementary school', 'high school, vocational', 'high school, general', 'college/university less than 4 years', 'college/university 4 years or more' and 'do not know'. These levels were collapsed into basic (elementary school level), intermediate (high-school levels), higher (college/university levels) and unknown, resulting in a variable denominating the highest parental education in the family.

Maternal and paternal work statuses were assessed by the adolescents' responses to questions regarding their parents' work affiliation and type of work. This resulted in a two-level variable: 'working' (i.e., those currently working) and 'benefits or other' (e.g., unemployment/seeking employment, sickness/disability, or students, retired or stay-at-home parents).

Perceived economic well-being (PEWB) was assessed by the following question: 'Compared to others, how would you rate your family's economic situation?' Response options were 'poorer than others', 'equal to others' and 'better than others'.

Family structure was defined according to adolescents' answers to questions regarding whether their biological parents lived together or not, resulting in a dichotomous variable: nuclear (i.e., their parents lived together) and separated (i.e., their parents did not live together).

2.2.2 | Child welfare contact

Youth stating that they had received interventions from the CWS during the past year and that they lived at home with their original family (i.e., not living with foster parents or in institutions) were defined as receiving IHS (n = 141, 1.5%). Adolescents confirming that they lived with a foster mother, foster father or foster parents were defined as living in FC (n = 155, 1.6%). The remaining participants (i.e., those neither in contact with the CWS nor living with foster parents) were defined as the *general population* (GP: n = 9489, 96.9%). A detailed account of this operationalization is presented in a previous publication (Heradstveit et al., 2020).

2.3 | Measures of mental health

2.3.1 | General internalizing and externalizing problems

General internalizing and externalizing problems were measured by the Strengths and Difficulties Questionnaire (SDQ). The SDQ is a screening instrument for mental health problems initially developed for children and adolescents aged 4–17 years (R. Goodman, 1997, 1999). It consists of five subscales measuring emotional symptoms, conduct problems, hyperactivity–inattention, peer relationship problems and prosocial behaviours. Each subscale consists of five items, measured on a 3-point Likert scale ('*not true*', '*somewhat true*' or '*certainly true*'). The general internalizing problems scale is created by combining the peer problems and emotional problems subscales, whereas the general externalizing problems scale is created by combining the conduct problems and hyperactivity–inattention subscales (A. Goodman et al., 2010). Previous investigations have found the SDQ to be reliable and valid for use in samples of adolescents (Muris et al., 2003). Research has also found that the SDQ displayed adequate psychometric properties among older adolescents up to 19 years of age (Roy et al., 2008), and a previous study found that the SDQ displayed adequate psychometric properties also in the current sample of older adolescents from the youth@hordaland study (Bøe et al., 2016). The coefficient omega for the SDQ internalizing and SDQ externalizing scales was 0.73 and 0.76, respectively.

2.3.2 | Depression

Symptoms of depression were measured by the Short Version of the Mood and Feelings Questionnaire (SMFQ) (Angold et al., 1995). The SMFQ consists of 13 items measuring cognitive and affective symptoms of depression rated on a 3-point Likert scale, with the options '*not true*', '*sometimes true*' and '*true*'. The SMFQ has been found to have good psychometric properties in population-based studies of older adolescents (Turner et al., 2014), and essential unidimensionality has been documented in a previous study based on the youth@hordaland sample (Lundervold et al., 2013). The omega of the SMFQ in the current study was 0.95.

2.3.3 | Anxiety

Symptoms of anxiety were identified using the short five-item version of the Screen for Child Anxiety Related Emotional Disorders (SCARED) (Birmaher et al., 1999). This short version consists of five items found to discriminate best between anxious and nonanxious children and has shown similar psychometric properties to the full 41-item SCARED (Birmaher et al., 1999). The items are rated on a 3-point Likert scale, with the options '*not true*', '*sometimes true*' and '*often true*'. The omega of the SCARED in the present study was 0.71.

2.3.4 | ADHD symptoms

ADHD symptoms were measured using the Adult ADHD Self-Report Scale (ASRS) (Kessler et al., 2005). ASRS consists of 18 items: nine items measure inattention symptoms, and nine items measure symptoms of hyperactivity–impulsivity. Although initially developed for adults, the ASRS has been validated and found to have high internal consistency and construct validity among adolescents (Adler et al., 2012). Symptoms are rated on a 5-point Likert scale ranging from '*never*' to '*very often*'. The omega of the ASRS inattention subscale was 0.89, and the omega ASRS hyperactivity subscale was 0.86.

2.3.5 | Obsessive–compulsive behaviour

Five items measured key aspects of obsessive–compulsive behaviour, as outlined by Thomsen (1998): 'I wash myself more than normal. I am afraid of infection', 'I often have to check or control things', 'I am concerned with order and symmetry', 'I must often have repeated assurances and answers to questions' and 'I have distressing or disturbing thoughts'. The items were rated on a 3-point Likert scale ('*not true*', '*somewhat true*' and '*certainly true*'). The omega in the current study was 0.73.

2.3.6 | Perfectionism

Perfectionism was measured by the short version of the Perfectionism subscale from the Eating Disorder Inventory (Garner et al., 1985). The subscale consists of six items assessing excessive personal and parental expectations, such as 'I have very high goals for myself' and 'I will do everything not to disappoint my parents'. The original 6-point response scale was adapted to a 3-point response scale for the present study ('*not true*', '*somewhat true*' and 'certainly true'). The omega of the scale was 0.76.

2.3.7 | Service use

The adolescents reported whether they had been in contact with health services during the last school year. The response categories were 'general practitioner', 'school health services', 'mental health services for adolescents' and 'adolescent health clinic'. We also created a variable indicating any contact with the services above.

2.3.8 | Adverse life events

We measured eight potential adverse life events from five items detailing whether the adolescents had ever experienced (i) 'a catastrophe or serious accident', (ii) 'violence from a grown-up', (iii) 'witnessed someone you care about being exposed to violence from a grown-up' and (iv) 'unwanted sexual actions'. The response

alternatives were either 'no, never', 'yes, once', 'yes, sometimes' and 'yes, several times' or 'no, never', 'yes, once' and 'yes, more than once'. All responses, excluding 'no, never', were used to indicate exposure to the adverse life event in question. In addition, a fifth item detailed whether the adolescents had experienced 'death of someone close to you'. If the adolescent had experienced death of someone close, they were asked to specify their relationship with the person(s). Death of a (v) parent/guardian, (vi) sibling, (vii) close friend and (viii) girlfriend/boyfriend were included as separate negative events. We calculated a variable denoting the total number of adverse life events experienced (range 0–8).

2.4 | Statistical analyses

All analyses were performed using R Version 4.0.2 for Windows (R Core Team, 2019). Internal consistency for the mental health outcomes was assessed by McDonald's omega, calculated with the lavaan (Rosseel, 2012) and semTools (Jorgensen et al., 2020) R packages. McDonald's omega has some advantages over the commonly used Cronbach's alpha (e.g., does not require tau-equivalence) and has in several studies been shown to be a more sensible index of internal consistency (see Dunn et al., 2014). Like the coefficient alpha, no universally accepted guidelines for adequate levels of omega reliability exist. Still, it has been suggested that the omega should at a minimum be greater than 0.50, with values closer to 0.75 being preferred (Reise et al., 2013).

Welch's one-way analysis of variance (ANOVA) with Games–Howell post hoc test was conducted to investigate possible differences in the total number of adverse life events across CWS status on observed data. The results of these analyses are presented visually using the 'ggstatsplot' R package (Patil, 2018).

We performed a series of ordinary least squares (OLS) regression analyses to investigate the associations between CWS status and symptoms of mental health problems and perfectionism. Logistic regression analyses were further conducted to estimate odds ratios (ORs) of contact with the health services by CWS status. In the OLS regressions, the continuous symptom scales were *z*-transformed (i.e., setting the grand mean to 0 and the standard deviation equal to 1) and regressed on the CWS status variable to estimate standardized mean differences (SMDs) between the groups. We organized all regression analyses similarly: first, we assessed the associations between CWS status, symptom scores and health service use adjusted by age and gender (baseline model). In the next model, adverse life events were added (adjusted model).

There were some incomplete cases dispersed across variables utilized in the present study: on the entire sample (N = 10,257), the majority of missingness pertained to paternal work status (10.6%), followed by family structure (9.2%) and maternal work status (7.3%). Variables indicating CWS status and service use had 4.6% missing cases, whereas the mental health scales had missingness in the range of 1.7% to 5.1%. A detailed overview of missingness by CWS status is shown in Table 1.

In all regression models, missing values were handled by multiple imputation using the R package 'mice' (van Buuren & Groothuis-Oudshoorn, 2011). Multiple imputations perform superior to other conventional methods (e.g., listwise and pairwise deletion, or mean imputation), unless the proportion of missing is very low or missing completely at random, which seldom is the case (Schafer & Graham, 2002). We considered data to be missing at random (MAR), and variables entered in the imputation model were age, gender, ethnicity, parental education, parental work status, PEWB, family structure, service use variables, and mental health symptom and perfectionism scores. A total of 30 imputations were made with up to 25 iterations each. The estimates and standard errors from the analyses were pooled into overall estimates according to Rubin's rules (Rubin, 1987).

The present study's main interest was the link between CWS status, adverse life events, and mental health and health service use among adolescents. Therefore, we chose not to further adjust our analyses by socio-economic indicators (i.e., parental education and work affiliation, PEWB, family structure and ethnicity) to avoid overcontrol bias (Grätz, 2019). These variables are known correlates of exposure to adverse life events, mental health issues and service contact. Coupled with the small samples in the IHS and FC groups, the inclusion of these variables in the analyses could make inferences regarding variables of key interest in the present study more difficult.

We present all estimates from the main regression analyses visually as regression coefficient plots with statistical parameters embedded in the figures. All parameter estimates are presented with 99% confidence intervals, and we consider an alpha of <0.01 as statistically significant, due to the number of tests conducted in this study. For ease of exposition, we group together mental health symptom measures that may be characterized as internalizing mental health outcomes (i.e., general internalizing problems [SDQ], depression [SMFQ], anxiety [SCARED], OCD and perfectionism) and externalizing mental health outcomes (i.e., general externalizing problems [SDQ], and hyperactivity [ASRS] and inattention problems [ASRS]), in two separate figures.

Sensitivity checks were performed for all regression analyses using observed data only. The results from these analyses did not substantially deviate from the results reported based on multiple imputed data (see results in the Supporting Information). The scripts reproducing all analyses are available online at https://osf.io/nr96a/.

3 | RESULTS

Adolescents receiving interventions from the CWS (i.e., IHS or FC) were somewhat younger than the general population. More females (67%) than males received IHS, whereas slightly more males (55%) than females lived in FC. A higher proportion of adolescents in the CWS group reported that they or their parents had a foreign origin, to have separated parents and to come from more socioeconomically disadvantaged families. There were higher proportions of youth

TABLE 1 Characteristics of the sample by CWS status (*N* = 9785)

	GP (*n* = 9489)[a]	IHS (*n* = 141)[a]	FC (*n* = 155)[a]
Age	17.43 (0.84)	17.20 (0.77)	17.24 (0.78)
Missing	36 (0.4%)	2 (1.4%)	0 (0%)
Gender			
Female	5051 (53%)	95 (67%)	70 (45%)
Ethnicity: adolescent			
Norwegian	8900 (95%)	116 (85%)	109 (75%)
Missing	111 (1.2%)	5 (3.4%)	9 (5.8%)
Ethnicity: mother			
Norwegian	8683 (92%)	116 (82%)	109 (71%)
Missing	9 (0.1%)	0 (0%)	2 (1.3%)
Ethnicity: father			
Norwegian	8532 (90%)	110 (78%)	109 (73%)
Missing	37 (0.4%)	0 (0%)	5 (3.2%)
Family structure			
Nuclear	6167 (70%)	36 (31%)	53 (45%)
Separated	2581 (30%)	82 (69%)	65 (55%)
Missing	741 (7.8%)	23 (16.3%)	37 (23.9%)
PEWB			
Worse than others	630 (6.8%)	39 (29%)	16 (11%)
Like most others	6292 (68%)	69 (51%)	91 (64%)
Better than others	2382 (26%)	27 (20%)	35 (25%)
Missing	185 (1.9%)	6 (4.3%)	13 (8.4%)
Parental education			
Basic	370 (3.9%)	18 (13%)	14 (9.5%)
Intermediate	2896 (31%)	47 (34%)	45 (30%)
High	4331 (46%)	35 (25%)	45 (30%)
Unknown	1815 (19%)	40 (29%)	44 (30%)
Missing	77 (0.8%)	1 (0.7%)	7 (4.5%)
Maternal work status			
Work	8247 (92%)	93 (74%)	88 (71%)
Missing	560 (5.9%)	15 (10.6%)	31 (20.0%)
Paternal work status			
Work	8203 (95%)	89 (85%)	100 (86%)
Missing	863 (9.1%)	36 (25.5%)	39 (25.2%)
Adverse life events			
0	5541 (60%)	22 (16%)	64 (44%)
1	2350 (25%)	36 (26%)	32 (22%)
2	935 (10%)	30 (22%)	22 (15%)
3	296 (3.2%)	33 (24%)	11 (7.6%)
4 or more	112 (1.2%)	17 (12%)	16 (11%)
Missing	225 (2.4%)	3 (2.1%)	10 (6.5%)

Note: 'Missing' indicates missing values by variables included in the study (stratified by CWS status).
Abbreviations: CWS, child welfare system; FC, foster care; GP, general population; IHS, in-home services; PEWB, perceived economic well-being.
[a]Statistics presented: mean (SD) and *n* (%).

receiving IHS or living in FC that reported having experienced multiple adverse life events, compared with general population youth (see Table 1 for details). As shown in Figure 1, all pairwise comparisons between the three groups on total number of adverse life events were statistically significant, suggesting that the highest number of adverse life events were found among youth receiving IHS (mean = 1.95),

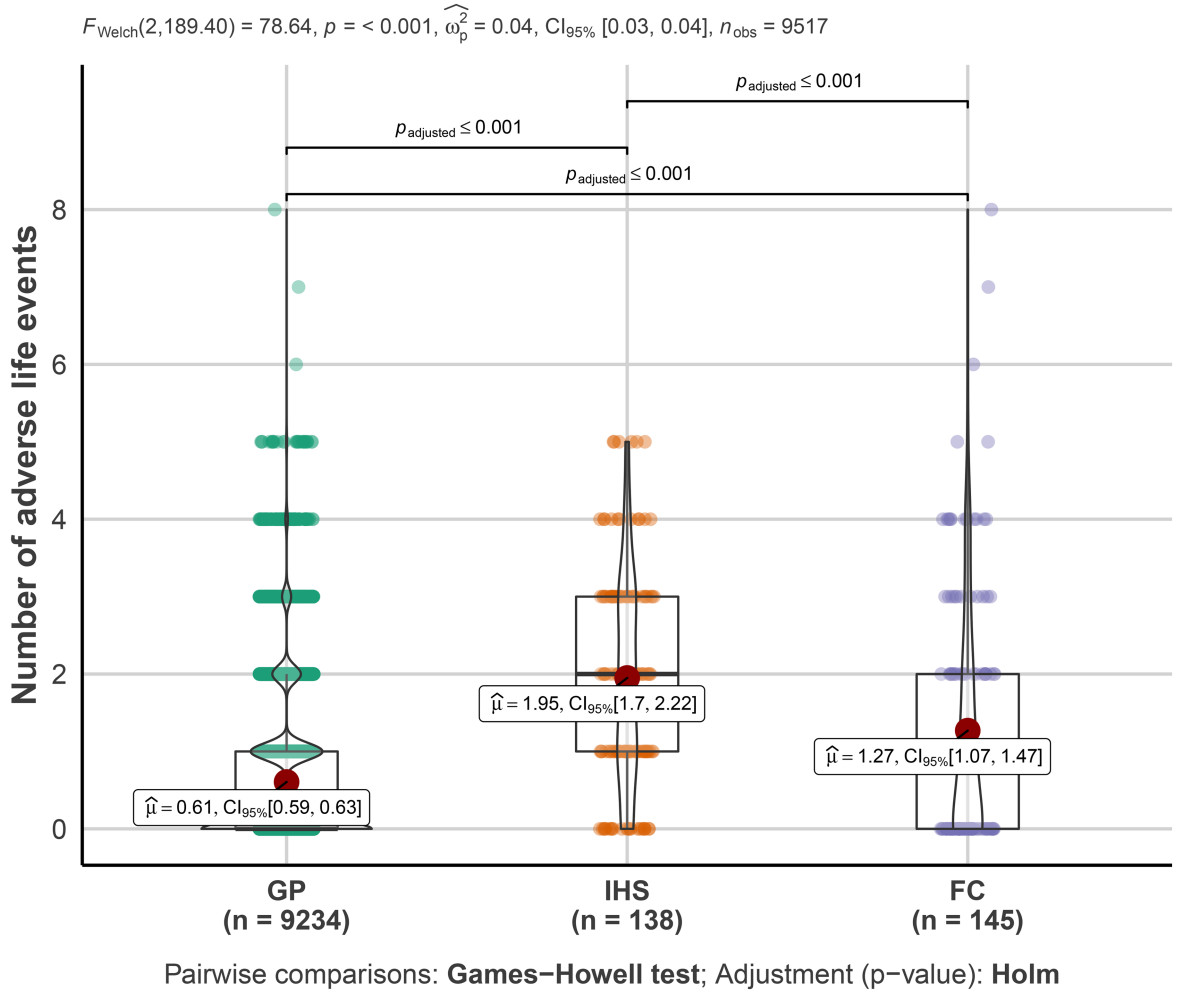

FIGURE 1 Number of adverse life events by child welfare system (CWS) contact. This figure comprises a mix of a violin plot (displaying the shape of the variable distribution) and a box plot (where the box is split by the median and bounded by the first and third quartiles of the distribution) along with the jittered raw data points. The red dot signifies mean values, also reported numerically as $\hat{\mu}$ with accompanying 95% confidence intervals ($CI_{95\%}$). FC, foster care; GP, general practitioner; IHS, in-home services

followed by those in FC (mean = 1.27) and youth from the general population (mean = 0.61).

3.1 | CWS contact and symptoms of internalizing problems

Figure 2a displays the SMDs between adolescents in the CWS groups and the general population on instruments assessing domains of internalizing problems. In the baseline model, youth receiving IHS or living in FC reported significantly higher symptom load on measures of depression, general internalizing problems, anxiety and OCD, compared with general population youth. The SMDs ranged from 0.35 (OCD) to 0.91 (depression) for the IHS group and 0.32 (general internalizing problems) to 0.62 (depression) for youth in FC. Neither the IHS group nor the FC group scored significantly higher on perfectionism compared with the general population. Comparisons between the IHS and FC groups (Figure 2b) revealed that the IHS group scored significantly higher on depression (SMD = 0.30) and general internalizing problems (SMD = 0.51) than youth in FC.

Adjusting for adverse life events attenuated the strength of the associations across all symptom scales (Figure 2a, adjusted model). Compared with the general population, youth in FC were no longer statistically significantly different on general internalizing problems, whereas those receiving IHS were not significantly different on the OCD subscale. Similarly, the difference between the IHS and FC groups was no longer significantly different on the depression scale in the fully adjusted analyses (Figure 2b, adjusted model).

3.2 | CWS contact and symptoms of externalizing problems

Compared with peers from the general population, youth living in FC or receiving IHS had significantly higher scores on measures of

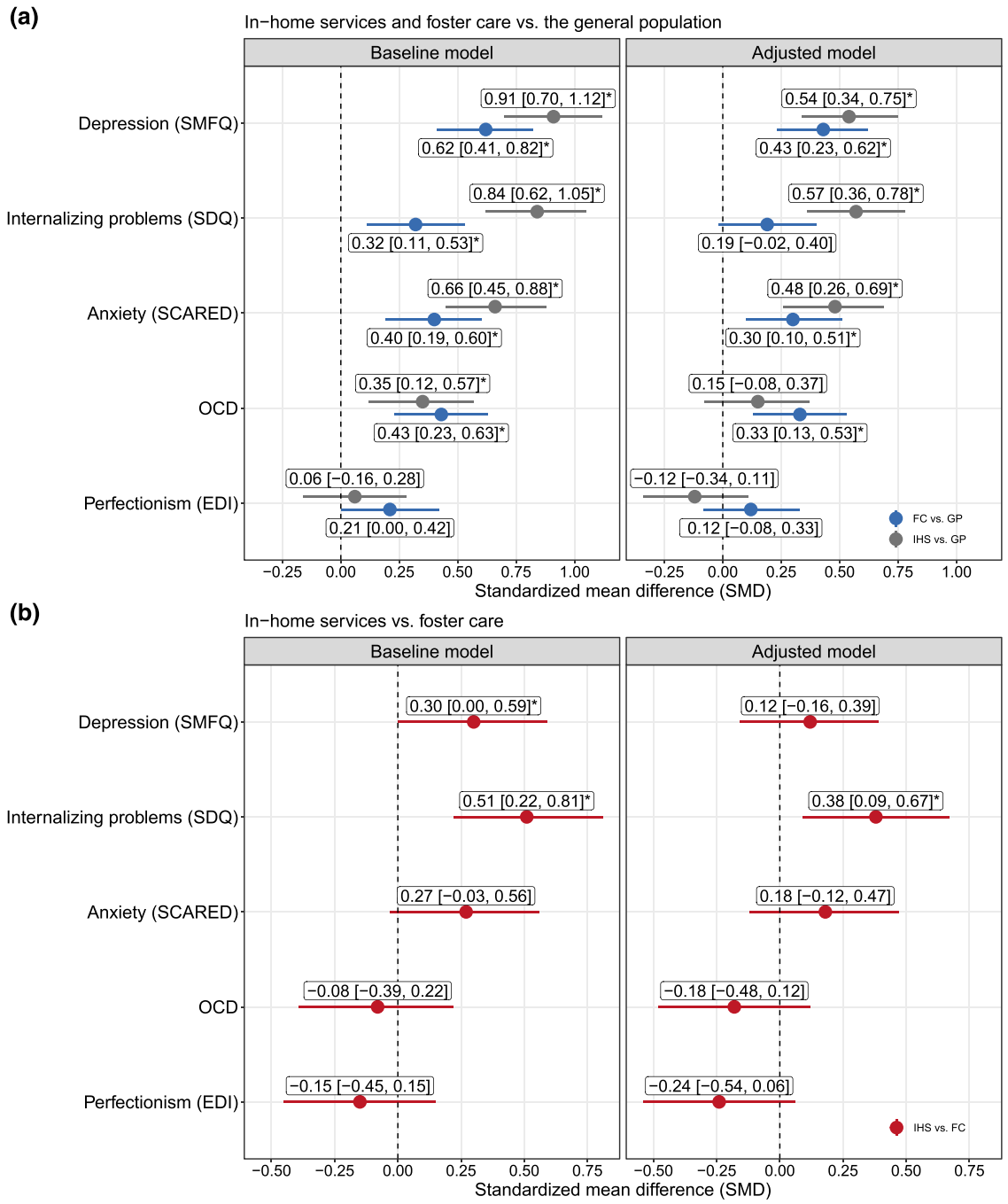

FIGURE 2 Standardized mean differences across internalizing symptom scores. This figure shows the predicted standardized mean difference in internalizing symptom scores between adolescents in contact with the child welfare system (CWS) and the general population (GP) (a) and the predicted standardized mean differences between youth receiving in-home services (IHS) and living in foster care (FC) (b). Baseline model is adjusted for age and gender. The adjusted model is in addition adjusted for adverse life events. Pooled estimates from 30 imputed datasets shown. Error bars represent 99% confidence intervals. EDI, Eating Disorder Inventory; OCD, obsessive–compulsive disorder; SCARED, Screen for Child Anxiety Related Emotional Disorders; SDQ, Strengths and Difficulties Questionnaire; SMFQ, Short Version of the Mood and Feelings Questionnaire. *$p < 0.01$

general externalizing problems (SMDs: IHS = 0.89 and FC = 0.43) and hyperactivity (IHS = 0.64 and FC = 0.25; see Figure 3a). Only those receiving IHS scored significantly higher on inattention problems (SMD = 0.52). Across all measures, youth receiving IHS had significantly higher scores than peers in FC (see Figure 3b). After adjustments of adverse life events, no significant differences on the hyperactivity scale between youth in FC and the general population were detected (Figure 3a, adjusted model). Also, the difference between the FC and IHS groups on the hyperactivity scale was no longer significant (Figure 3b, adjusted model).

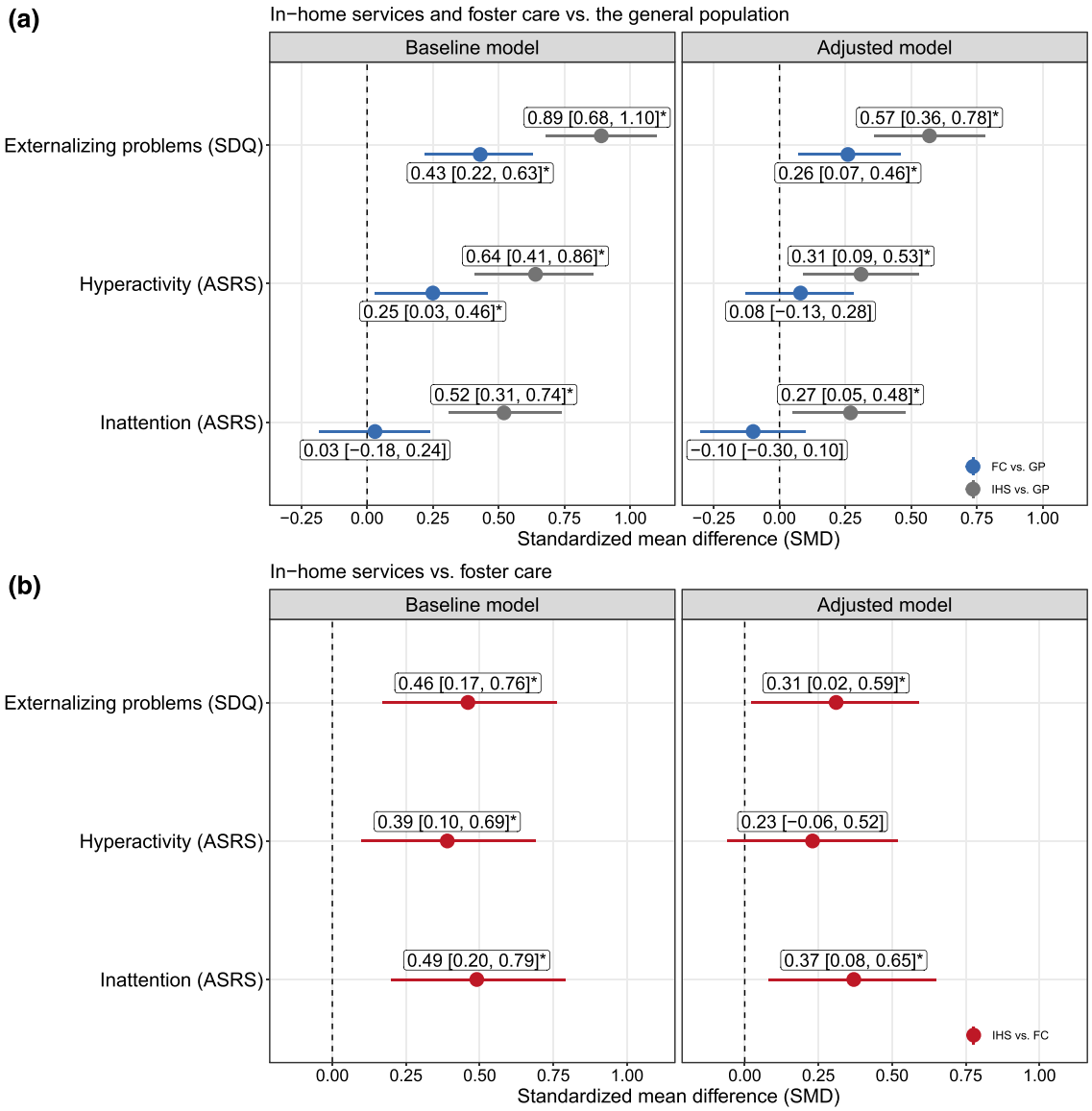

FIGURE 3 Standardized mean differences across externalizing symptom scores. This figure shows the predicted standardized mean difference in externalizing symptom scores between adolescents in contact with the child welfare system (CWS) and the general population (GP) (a) and the predicted standardized mean differences between youth receiving in-home services (IHS) and living in foster care (FC) (b). Baseline model is adjusted for age and gender. The adjusted model is in addition adjusted for adverse life events. Pooled estimates from 30 imputed datasets shown. Error bars represent 99% confidence intervals. ASRS, Adult ADHD Self-Report Scale; SDQ, Strengths and Difficulties Questionnaire. *$p < 0.01$

3.3 | Contact with health services

Youth receiving IHS were significantly more likely to report contact with all services compared with peers from the general population. They were also significantly more likely to report contact with services than those in FC, except for the school health services. The most frequented service was the general practitioner, where more than 50% of youth receiving IHS reported contact during the last school year. The largest difference between the groups was observed for the mental health services, whereby 35.2% receiving IHS reported contact, compared with 3.7% from the general population and 17.9% among youth in FC. Compared with general population youth, those in FC were only significantly more likely to report contact with the school health services (see Figure 4 for details).

ORs of contact with health services by CWS status are shown in Figure 5. Adolescents receiving IHS had consistently higher ORs of being in contact with health services during the last school year compared with youth from the general population. The highest ORs were observed for contact with the mental health services (OR = 11.87) and the adolescent health clinic (OR = 4.11). Compared with the general population, youth in FC had higher odds of contact with the mental health services (OR = 5.78), and the school health services (OR = 2.46), but not the remaining services. Pairwise comparisons between the IHS and FC groups revealed

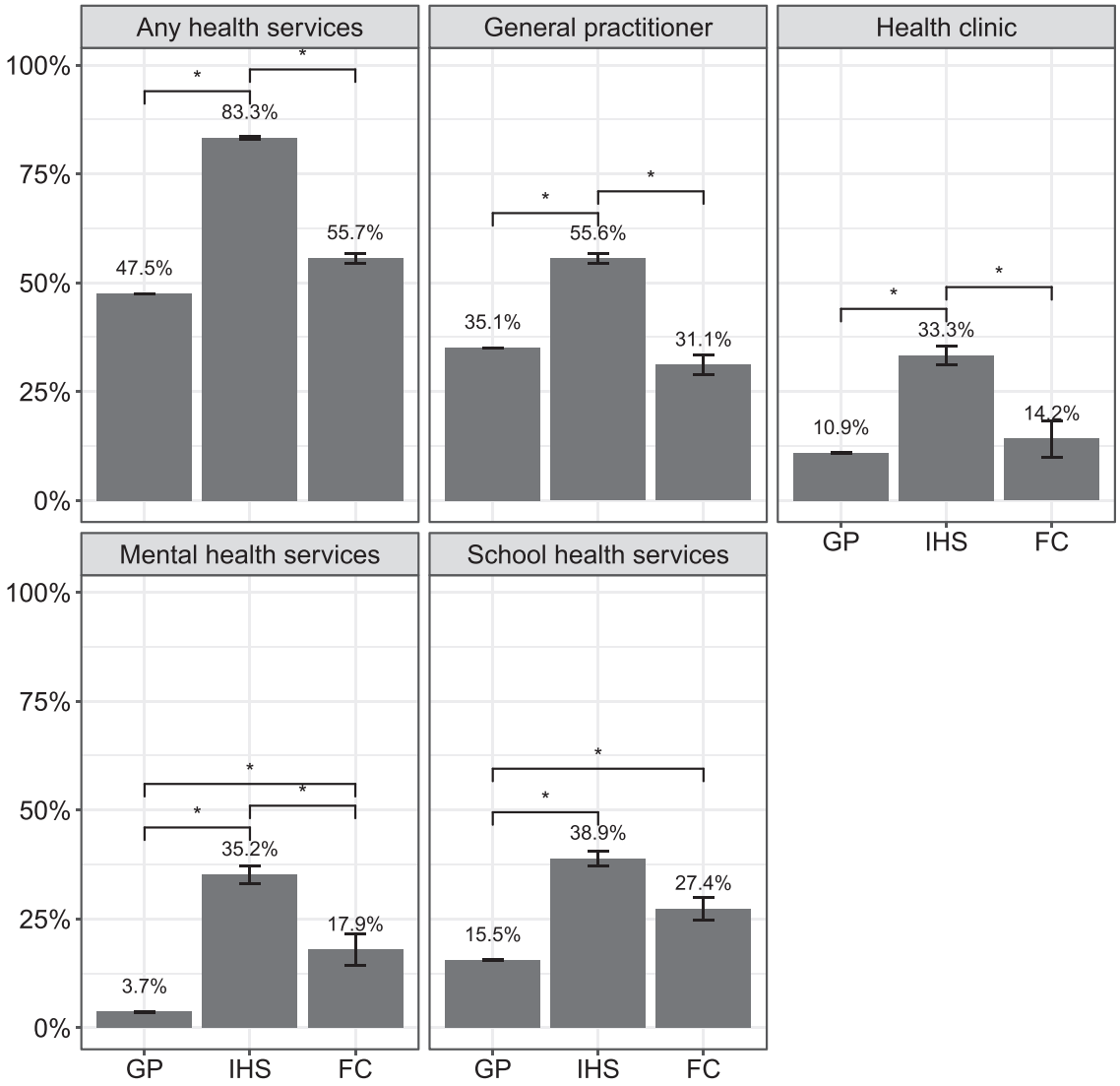

FIGURE 4 Proportions of health service use by child welfare system (CWS) contact. This figure shows the proportion of service use by CWS status using observed data (FC, foster care; GP, general population; IHS, in-home services). Error bars represent 95% confidence intervals. Only significant pairwise comparisons are annotated in the plot (*$p < 0.01$)

that the IHS group had significantly higher ORs of being in contact with any health services (OR = 4.20), the general practitioner (OR = 2.39) and the adolescent health clinic (OR = 2.95) in the baseline model. Accounting for adverse life events attenuated all estimates but did not remove any significant differences from the baseline model.

4 | DISCUSSION

In this large population-based study, we found that youth receiving IHS or living in FC had significantly higher symptom scores across a range of instruments assessing mental health problems compared with the general population. Receiving IHS was further significantly associated with more symptoms of depression, general internalizing and externalizing problems, and ADHD, than living in FC. Similarly, health service use was most prevalent among those receiving IHS, particularly with regard to the mental health services for adolescents. Adverse life events emerged as an important covariate and reduced the differences between the groups by 30% to 60%, depending on the outcome measure.

4.1 | Mental health among CWS youth compared with the general population

Our findings generally mirror previous studies reporting more mental health problems among children and youth receiving IHS or in FC compared with the general population (Goemans et al., 2016; Maclean et al., 2016). A recent meta-analysis reported higher levels of externalizing than internalizing problems among children and youth within the CWS and found no overall significant differences in internalizing

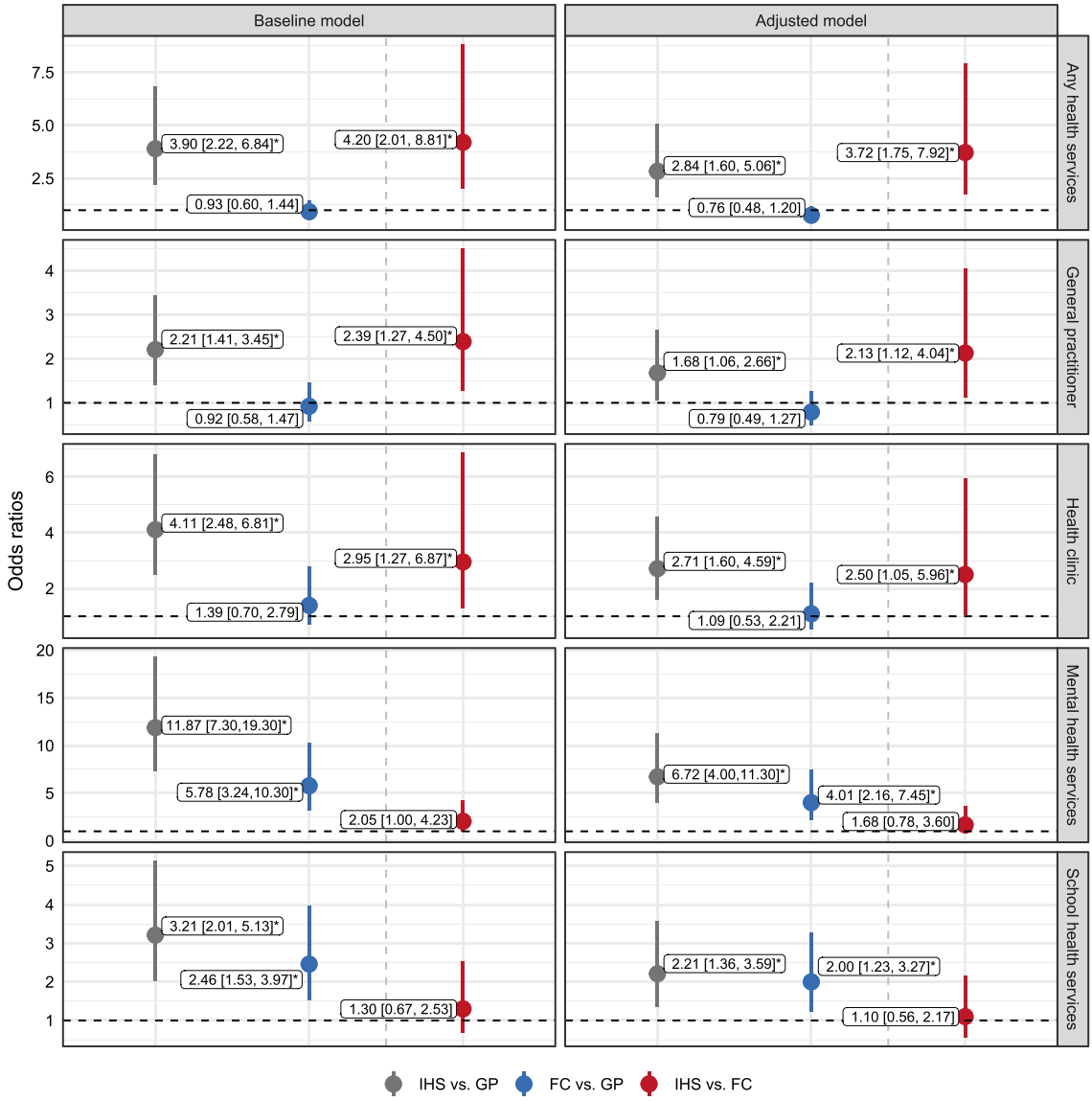

FIGURE 5 Associations between child welfare system (CWS) contact and health service use. This figure shows the predicted odds ratios (ORs: circular dots, annotated) with 99% confidence intervals (error bars, annotated in brackets) of being in contact with services by CWS status (FC, foster care; GP, general population; IHS, in-home services). Baseline model is adjusted for age and gender, Adjusted model is in addition adjusted for ethnicity and adverse life events. Pooled estimates from 30 imputed datasets shown. Dotted horizontal grey lines represent ORs of 1.0. Note that the *y* axes are scaled differently across panels. *$p < 0.01$

problems between youth in FC and general population youth (Goemans et al., 2016). Here, the present study partly diverged, as youth within the CWS, for the most part, had higher scores on measures of both internalizing and externalizing characters that were of a similar magnitude, compared with the general population. This discrepancy might be an artefact due to the prevalent use of teacher and caregiver reports in previous studies. Externalizing problems are considered more readily observable than internalizing problems (Kolko & Kazdin, 1993), and caregivers tend to report fewer internalizing problems than youth themselves (Romano et al., 2005). The high levels of internalizing symptoms found among youth within the CWS further align with the well-established link between exposure to psychosocial stress and depression in youth (Thapar et al., 2012). In any case, our results highlight the importance of considering a broad spectrum of difficulties when investigating mental health among youth within the CWS.

Not all outcomes were significantly worse among youth in contact with the CWS. Neither the IHS group nor the FC group had significantly higher scores on perfectionism than the general population. Perfectionism has been linked to trait anxiety, depression and OCD (Frost & DiBartolo, 2002) and has been found to be elevated in other at-risk groups such as international adoptees (Askeland et al., 2015). Thus, this finding was somewhat surprising, and we can only speculate why this was the case. We are unaware of other studies investigating perfectionism among CWS involved youth, precluding comparisons with the existing literature.

Youth in FC further did not significantly differ on the inattention problems subscale of the ASRS compared with general population youth but scored significantly higher on the hyperactivity subscale. It is possible that the family environment and parenting quality provided by foster parents help structure the lives of foster youth in ways that limit the manifestation of inattention problems. Previous research has regularly found high levels of ADHD symptoms among youth in FC (Bronsard et al., 2016) but has rarely distinguished between hyperactivity and inattention symptoms. Our results indicate that this distinction could be important when investigating symptoms of ADHD among older youth in FC. Still, more research is needed to corroborate this finding before any firm conclusions can be drawn.

4.2 | IHS versus FC

Our results suggest that youth receiving IHS are characterized by a somewhat different symptom profile than those in FC. Specifically, they reported significantly more general externalizing and internalizing problems, ADHD and depression but were similar to peers in FC regarding symptoms of anxiety, OCD and perfectionism. These results contrast a recent meta-analysis suggesting similar levels of both internalizing and externalizing mental health problems between these groups (Goemans et al., 2016). However, previous studies have often had few respondents (<60 per group), which could indicate that they were not properly powered to detect or reject relevant differences between the groups. Many previous studies have also been conducted in the United States on samples with ages ranging from 2 to 18 years (see Goemans et al., 2016). Hence, existing findings may not necessarily compare to the current study on a sample of older Norwegian youth aged 16–19.

Various mechanisms might give rise to differences in mental health between youth receiving IHS and youth in FC, including differences in home environments, parenting and risk exposure (Goemans et al., 2016; Maclean et al., 2016). In the present study, accounting for adverse life events attenuated and partly explained some of these differences. Specifically, the depression and hyperactivity symptom scores were no longer statistically significantly higher in the IHS group in the fully adjusted model. The amount of exposure to adverse life events therefore appears to be one mechanism contributing to the higher risk for mental health problems among youth receiving IHS.

We found that youth in FC had experienced fewer adverse life events than peers receiving IHS, which could indicate that placement shelters these children from further risk exposure. These youth also continued to score lower on the SDQ externalizing and internalizing scales, and inattention problems than peers receiving IHS, after accounting for adverse life events. Thus, our findings may further suggest that FC recuperates some of the traumas these youth have been exposed to. Still, caution is needed when interpreting this finding, as no baseline measures of mental health (i.e., before placement) were available. Moreover, international studies tend to find that their mental health is rather stable (neither improves nor worsens much) during their time in FC, a conclusion also reached by two Norwegian studies (Havnen et al., 2014; Jacobsen et al., 2020). However, these findings cannot illuminate how FC youth would have fared without placements (i.e., the counterfactual). Stable levels of mental health problems over time among those in FC may also represent a positive effect of FC, as it appears likely that their mental health would have deteriorated if had they stayed put in their original familial and environmental surroundings.

It should be noted that the average number of adverse life events in the two CWS groups was somewhat low. This could, in part, be due to the severity of the items (e.g., violence and death of close family/friends) and lack of items assessing other forms of risk exposure (e.g., parental drug use and inadequate parenting).

Although not measured in the present study, it is also likely that ongoing stressors, such as poverty, poor parental mental health and inadequate parenting, continue to impact youth receiving IHS (Conn et al., 2015). Existing mental health problems among youth may further be the very reason why some families seek aid from or are referred to the CWS. Also, given our focus on older adolescents, some youth receiving IHS may have only recently been detected by the CWS and could thus have spent a fair amount of their childhood under suboptimal conditions. Youth in FC, on the other hand, may have received IHS before being placed (Christiansen & Anderssen, 2010) and could thus have received services for a longer period than the IHS group. In sum, multiple factors likely contribute in explaining the pattern observed in the present study, and information on the reason for and duration of the interventions received by the CWS could have nuanced our findings.

4.3 | Health service use

Health service use was generally most prevalent among youth receiving IHS, and 83.6% reported contact with any services during the last school year, compared with 54.6% of those in FC and 47.1% of general population youth. All adolescents had most contact with the general practitioner, followed by the school health services, the mental health services and the adolescent health clinic. Youth receiving IHS had significantly higher ORs of contact with all health services than the general population and had higher odds of contact with all services except the school health services than peers in FC. Youth in FC, however, had only higher odds of contact with the mental health and school health services compared with the general population.

Overall, these results partly match previous findings suggesting higher service use among youth in contact with the CWS than the general population. However, a recent review suggested higher service use among children and youth in FC than those receiving IHS (see Maclean et al., 2016). As the CWS and health services are structured differently across countries, direct comparisons with international literature are challenging. We are unaware of previous studies investigating service use among older adolescents receiving IHS. Our findings appear, however, similar to a previous Norwegian study suggesting that about 12–36% of youth in FC had contact with health services during the past 2 years, although the use of mental health

services was lower in the present study (17.8% vs. 27.2%) (Larsen et al., 2018).

Our results partly suggest a correspondence between levels of mental health problems and health service use between the two CWS groups, whereby the IHS group had the highest levels of mental health problems and the highest service use. Although this might be considered a positive sign, only 34.5% of youth receiving IHS and 17.8% of those in FC reported contact with the mental health services during the past school year. This might seem low, given their high levels of mental health problems. In the present study, health service use was defined according to contact with the given service during the past year. As such, we cannot exclude the possibility that lower service use reported by youth in FC stems from previous successful treatments. Future studies are needed to explore how such factors may underlie reported service use among youth within the CWS.

4.4 | Strengths and limitations

The study's main strength was the large sample size that enabled comparisons between CWS clients and the general population across multiple validated mental health measures. The distinction between youth receiving IHS and living in FC is a particular strength, as many previous studies have focused exclusively on one of these subgroups. Another strength was the inclusion of adverse life events and the examination of a relatively narrow age range, permitting inferences regarding the mental health among older adolescents within the CWS.

Several limitations should be noted. First, the categorization of IHS and FC was based on adolescent self-report, and we were unable to directly verify the accuracy of the adolescents' self-categorization. In the present study, 3.1% of youth aged 16–19 reported contact with the CWS. These numbers lend some support to outsample's representativeness, as they are close to—although slightly lower than—official statistics, which suggests that the true number in the total population is 3.9% (Statistics Norway, 2018a). However, girls were over-represented in the IHS group compared with official statistics. Combined with the modest response rate of 53% with adolescents in schools over-represented, some caution should be applied when generalizing the results of the present study.

Second, the IHS group was defined according to contact with the CWS during the past year, and we lacked information about why these youth became involved with the CWS, and the duration and number of interventions received. Similarly, data on placement history (i.e., the reason for placement, duration and number of placements) among youth in FC were not available. Hence, the present study is largely descriptive and cannot inform about how such factors may impact the link between CWS contact and mental health among youth.

Third, some ambiguity remains regarding our measure of parental education and work affiliation among youth in FC, as our measure did not explicitly differentiate between foster parents and biological parents. As FC youth's reports on these measures were much more similar to the IHS group than the general population, we assume that most have had their biological parents in mind when answering these questions. We can, however, not completely rule out that some have reported their foster parents' work status and parental education.

Lastly, the cross-sectional design of the present study precludes any causal inferences between CWS status, mental health and health service use among adolescents. Our findings might also be limited to a Norwegian context, as the organization of the CWS and health services differs across countries. For instance, CWS in Norway is considered more family oriented than in the United States and aims to support families while the child remains at home (i.e., through preventive and therapeutic programmes) before out-of-home placements are considered. Hence, our findings might not apply to countries like the United States, where the CWS is more oriented towards child protection (Gilbert et al., 2011). It should also be noted that the youth@hordaland survey was conducted in 2012. Although we are unaware of major societal changes relevant to this area of research since then, research on more recent samples is needed to corroborate our findings.

5 | CONCLUSIONS AND IMPLICATIONS

Youth in contact with the CWS are at greater risk of mental health problems across multiple domains of psychological functioning compared with peers from the general population. Compared with youth in FC, those receiving IHS appear to have higher risk of general externalizing and internalizing problems, and symptoms of ADHD. Although youth receiving IHS also had the highest service use, the high levels of mental health problems in this group beg the question of whether the services they receive from the CWS and the health services are sufficiently targeted and coordinated to adequately meet their needs. As these youth are on the verge of entering adulthood and leaving the CWS, service providers and policymakers should be aware of the likely continued challenges faced by many of these youth. Longitudinal studies, ideally tracking youth from before to after receiving interventions from the CWS, are needed to better understand the developmental pathways of mental health problems among this group.

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CONFLICT OF INTERESTS

The authors have no conflicts of interest to declare.

ETHICAL APPROVAL

The study was approved by the Regional Committee for Medical and Health Research Ethics in Western Norway.

DATA AVAILABILITY STATEMENT

Norwegian health research legislation and the Norwegian ethics committees require explicit consent from participants in order to transfer health research data outside of Norway. In this specific case, ethics approval is also contingent on storing the research data on secure storage facilities located in our research institution. Data are from the Norwegian youth@hordaland study whose authors may be contacted at bib@uni.no. The scripts reproducing all analyses are available online at https://osf.io/nr96a/.

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