



The Prevalence of High-Risk Behavior Among Adolescents in Aftercare Services and Transitioning from Out-of-home Care: A Systematic Review

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Received: 25 July 2022 / Accepted: 9 November 2022 / Published online: 25 November 2022
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Abstract

Adolescents in aftercare services who are transitioning from out-of-home care, also called care leavers, face more challenges in their lives, and engage in more risk behaviors, than their peers. However, no previous reviews have comprehensively addressed this issue to identify future research needs. The aim of this systematic review was to gather, assess, and synthesize previous studies concerning care leavers' high-risk behavior. The search was conducted in six databases, with sixteen articles included in the final review. The selected research highlighted five forms of high-risk behavior: substance abuse, delinquency, sexual behavior, irresponsible use of money, and self-destructive behavior. The incidence of high-risk behavior among care leavers varied noticeably between the studies. Some of the studies reported significant connections between high-risk behavior and gender, race, reason(s) for placement, and the form and number of placements. The synthesized findings revealed a fragmented, limited view of care leavers' high-risk behavior that highlighted substance abuse and delinquency. The development of adolescents, particularly care leavers, includes multiple factors that have either a conducive or protecting effect for high-risk behavior. Comprehensive research regarding care leavers' high-risk behavior, including the associated factors, is needed to better support healthy development and success in transitioning to independent living.

Keywords Adolescence · Aftercare service · Out-of-home care · High-risk behavior

Introduction

Out-of-home care is the temporary, medium-, or long-term placement of a child or adolescent who is unable to live with their own family (Mendes & Snow, 2016). It has been estimated that approximately 2.7 million children and adolescents between the ages of 0 and 17 are living in out-of-home care across 140 countries around the world (Petrowski et al., 2017). The number of children and adolescents in out-of-home care, as well as the services they are provided, vary across countries based on cultural, political, and legislative aspects (Mendes & Snow, 2016). These young

people represent a vulnerable group, and struggle with many aspects of life. In addition, they are more prone to risk behaviors than other adolescents their age (Häggman-Laitila et al., 2018; Shaw, 2017; Sims-Schouten & Hayden, 2017). Adolescence is a period of growth and development that is characterized by heightened risk-taking (Willoughby et al., 2021); these actions are defined as high-risk behavior when they increase the risk of disease or injury, disability, death, or social problems (Tariq & Gupta, 2022). The high-risk behaviors of adolescents can involve alcohol and substance abuse, use of nicotine products, reckless sexual behavior or use of money, functional addictions, eating disorders, excessive or insufficient exercise, self-destructive behavior, and delinquent behavior (e.g., Tariq & Gupta, 2022; Willoughby et al., 2021). This study focuses on the high-risk behaviors of adolescents who are transitioning from out-of-home care and/or are in aftercare services. In this article, this group of adolescents is referred to as care leavers.

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Transitioning from out-of-home care to independent adult life is a complex process in which aftercare services have been found to improve adolescents' prospects (Glynn & Mayock, 2019; Tyler et al., 2017). The knowledge base concerning the prevention of risk behaviors among children and adolescents who have been in out-of-home care relies on singular studies of substance abuse, criminality, and suicidal behavior (Havlicek et al., 2013; Gypen et al., 2017; Kääriälä & Hiilamo, 2017). As such, no previously published overview of the topic – which could guide future research – currently exists.

High-risk behavior leads to further problems and impairs the health and well-being of the individual and those who they interact with (Willoughby et al., 2021). For example, substance abuse and intoxication increase the risk of accidents, worsen behavioral disorders, and involve potentially fatal consequences (Lee et al., 2020; Kedia et al., 2021; Quimby et al., 2022). Moreover, risky sexual behavior increases the risk of exploitation, exposure to sexually transmitted diseases, and unwanted pregnancies (Hahn et al., 2021). Gaming addictions, gambling, and functional addictions can exclude adolescents from social relationships, enhance financial problems, make it difficult to engage in daily activities, and exacerbate mental health problems (Butler et al., 2020; Shoshani et al., 2021; Khalil et al., 2022). Longitudinal studies have shown that high-risk behaviors stemming from untreated behavioral disorders among adolescents lead to lower educational levels, financial difficulties, increased incidence of mental health and substance abuse problems, and higher premature mortality (Akasaki et al., 2019; Campbell et al., 2020).

The high-risk behavior of children and adolescents who have been in out-of-home care may impair the transition to independent life because these individuals already suffer from more health and well-being problems than their peers. For example, over 60% of adolescents in out-of-home care were diagnosed with a psychiatric or neurodevelopmental disorder, most commonly depression and anxiety disorders, and oppositional defiant disorder or conduct disorder (Kääriälä et al., 2021). The transition to independent life of a care leaver who has engaged in high-risk behavior is also impaired by a lack of informal and formal support, which increases the risk of social exclusion, problems with social interaction, homelessness, unemployment, low educational levels, and financial difficulties (Häggman-Laitila et al., 2018; Nho et al., 2017). The intensity of the challenges that care leavers face has been connected to the number and form of placements, as well as the reason for the placement (Scannapieco et al., 2016).

Several factors have been shown to be associated with high-risk behaviors (e.g., Meeus et al., 2021; Murray et al., 2021; Tinner et al., 2021); these include behavioral, activity,

and attention disorders, along with antisocial behavior (Song et al., 2021; Sultan et al., 2021). The underlying causes of behavioral disorders are complex; however, childhood abuse and neglect are important factors in the development of these disorders (García et al., 2021; Kobulsky et al., 2022). Untreated or medically neglected behavioral disorders can adversely affect the development of a child, as well as the transition period of adolescence (Okumura et al., 2021). The symptoms of untreated disorders usually become more visible at the start of puberty, and thus, may have serious consequences. This can result in adolescents suddenly showing significant behavioral changes, which may take an aggressive form, and manifest as high-risk behaviors, aggression, violence, and even committing crimes (Henriksen et al., 2021; Lindblad et al., 2020). A comprehensive view of the factors associated with high-risk behavior is crucial for understanding the developmental paths of adolescents and how they influence high-risk behavior. In addition, this knowledge would provide insight into the challenges which adolescents face and help identify effective ways to support vulnerable populations during and after out-of-home care.

Current Study

Knowledge of forms, prevalence and factors associated with the care leavers high-risk behavior is fragmented due to the lack of systematic review of previous empirical studies. The aim of this systematic review was to gather, assess, and synthesize previous evidence on adolescents' high-risk behavior while in aftercare services or transitioning from out-of-home care. The research is guided by two research questions, the first of which is what kind of high-risk behaviors have been identified in previous studies of adolescents in aftercare and/or transitioning from out-of-home care? The second research question is which associations between background factors and high-risk behavior have been identified among adolescents in aftercare services and/or transitioning from out-of-home care?

Methods

Design

A systematic review was conducted based on the procedure from the Centre for Reviews and Dissemination (2009) and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Page et al., 2021) for the identification, assessment, and synthesis of quantitative research.

Table 1 Databases, Search Terms, Inclusion and Exclusion Criteria

Databases	Search terms	Inclusion criteria	Exclusion criteria
CINAHL PsycInfo PubMed Scopus SocIndex Web of Science	(“Foster home care” OR “foster care” OR “out of home care” OR “out-of-home care” OR “residential care” OR “residential facilit*” OR “institutional care” OR “substitute care”) AND (young* OR adolescen* OR teen* OR adult* OR youth* OR juvenile*) AND (aftercare OR “after care” OR “leaving care” OR “care leavers”) AND (risk* OR radical* or danger* OR severe OR extrem* OR “substance use” OR “substance abuse” OR addiction OR gambling OR crim* OR prostitution OR promiscuity OR “self-harm” OR “self harm”)	1) Included search terms and synonyms 2) Empirical studies 3) High-risk behavior of young people who were in aftercare services 4) High-risk behavior of young people who were transitioning out-of-home care 5) High-risk behavior of young people who had foster care history 6) Intervention that focused on high-risk behavior of young people in aftercare services and/or when they were transitioning out-of-home care	1) Studies in which the young person was still in foster care 2) Studies where the participants had been in therapeutical residential care 3) Studies that focused problems that had no clear connection to high-risk behavior (e.g., homelessness, education, employment) 4) Studies that were describing the young person’s high-risk behavior from the perspective and experience of others (e.g., stakeholders, politicians)

Search Methods

The research team created a search strategy and search terms based on the research questions. An information specialist was consulted during the process to ensure that the terms would cover potentially relevant articles. A systematic literature search was conducted on the first of December 2021 using six databases: CINAHL; PsycInfo; PubMed; Scopus; SocIndex; and Web of Science. The same search terms were used across all six databases, except for PubMed, which also uses MeSH terms (Table 1). As PubMed, Scopus and Web of Science provided large numbers of hits, “article” was applied as a search limitation. In addition, title, abstract, and keyword were used to limit the hits in Scopus. Studies that were peer-reviewed and published between 2011 and 2021 were included in this review; no language restrictions were applied.

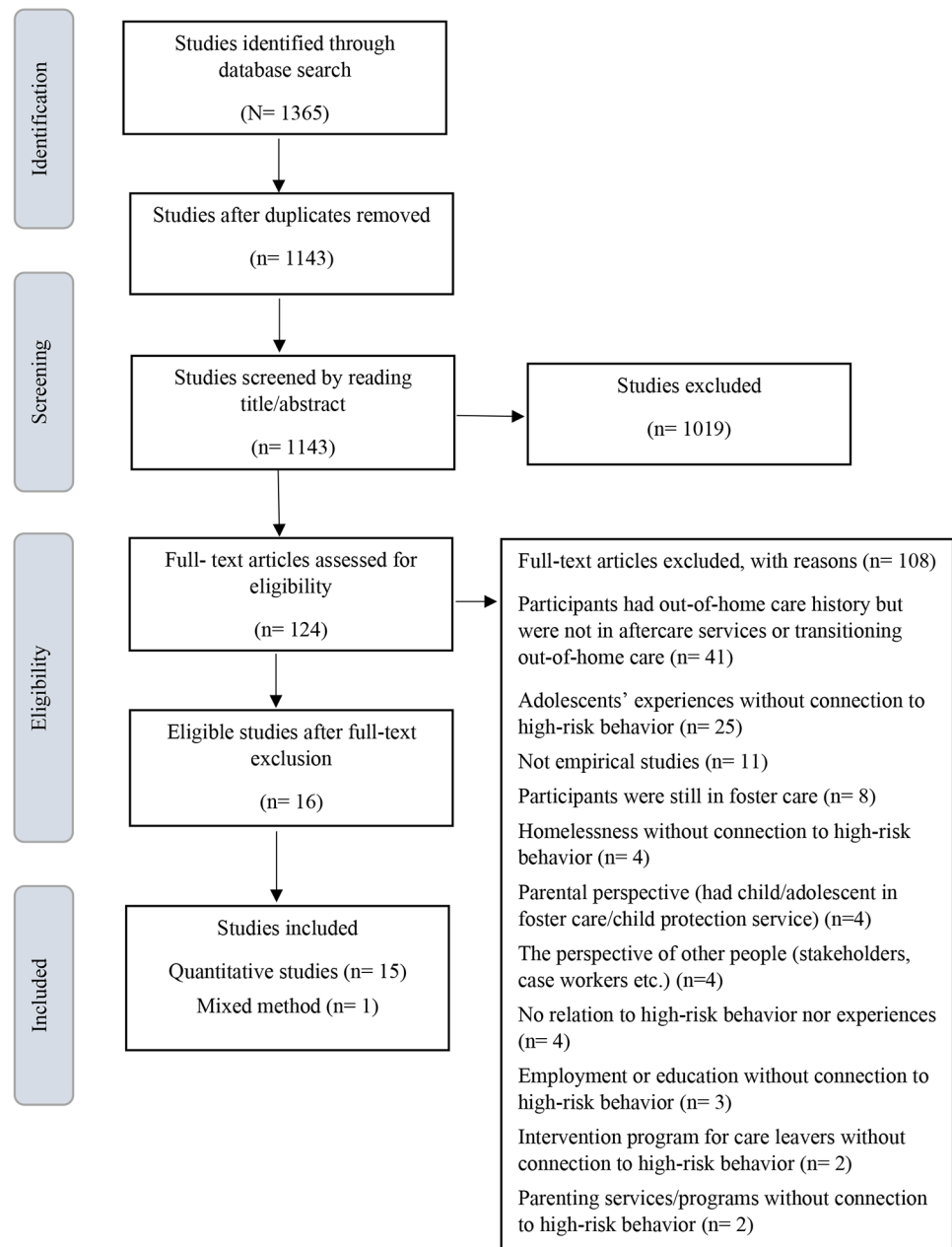
Search Outcome

The search yielded a total of 1365 studies. These were transferred to Covidence systematic review manager, after which duplicates ($n=222$) were removed by the system. Following duplicate removal, two authors (UKP, SK) independently screened the titles and abstracts ($n=1143$) of relevant articles according to the inclusion and exclusion criteria (Table 1). In the next step, full-text assessment, 57 out of 124 studies were found to meet the inclusion criteria. The studies represented quantitative (cross-sectional, registry and longitudinal studies), qualitative and mixed-methods research. The content of the studies could be divided into two groups: adolescents who were in aftercare or transitioning from out-of-home care to adulthood; and adolescents with a history of out-of-home care. Due to the large number of identified articles, a decision was made to only include the studies in which adolescents were in aftercare services or transitioning from out-of-home care at the time of the research. Hence, a total of 16 studies were included in this review. The studies that did not meet the inclusion criteria will be reported in another review. Any discrepancies about the selections of studies were discussed between the two authors. If a mutually satisfactory solution was not reached, another member of the research team was asked to resolve the issue. The study identification and selection process are shown as a PRISMA flow chart in Fig. 1.

Quality Appraisal

The quality of the included studies was independently assessed by two authors (UKP, SK) using Centre for Evidence-Based Management (2014) critical appraisal of a cohort or panel study (Table 2) and critical appraisal of a cross-sectional study (survey) tools (Table 3). Both tools consisted of 12 questions, with the researcher choosing one of three options (“yes”, “can’t tell” and “no”). The two authors compared their evaluations and made a final decision based on their respective answers. No disagreements emerged at this point. The checklist did not include any guidance about rating the studies; therefore, only consistency in the quality of the studies was considered. Concerning the cohort or panel studies, eight studies scored ten or more points and two studies scored seven or more points. For the cross-sectional studies, three studies scored seven or more points and three studies scored five or more points. All of the studies that were included in the review presented a clearly worded research question, used appropriate research methods, and the sample was representative of a defined population. However, five cohort studies did not apply a validated measurement tool, and confidence intervals were not specified. Furthermore, four of the cohort studies did

Fig. 1 The PRISMA Flowchart of Article Selection Process



not adequately address possible confounding factors. The sample size in all six of the cross-sectional studies was not based on prior considerations of statistical power, and confidence intervals were not given. In five cross-sectional studies it was impossible to determine whether a satisfactory response was achieved, and four studies did not adequately address confounding factors. None of the studies were excluded following the quality assessment.

Data Extraction

Data were extracted from each study and summarized in table form (Table 4). The extracted data included information such as origin of data, author(s), year of publication, study country, study aim, sample, study design and data collection, data analysis methods, and main results.

Synthesis

The data presented in the original studies were synthesized following the guidelines of the quantitative synthesis of a

Table 2 Quality Appraisal of the Included Cohort or Panel Studies with the Center for Evidence Based Management

Appraisal questions	Brown et al., 2015	Courtney & Hook, 2017	Dworsky et al., 2013	Kelly, 2020	Prince et al., 2019	Shpiegel et al., 2020	Shpiegel & Cascardi, 2018	van Breda, 2020	Yang et al., 2017	Zinn et al., 2017
1. Did the study address a clearly focused question / issue?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
2. Is the research method (study design) appropriate for answering the research question?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
3. Were there enough subjects (employees, teams, divisions, organizations) in the study to establish that the findings did not occur by chance?	yes	yes	yes	yes	yes	yes	yes	can't tell	yes	yes
4. Was the selection of the cohort / panel based on external, objective and validated criteria?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
5. Was the cohort/ panel representative of a defined population?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
6. Was the follow up of cases/subjects long enough?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
7. Were objective and unbiased outcome criteria used?	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
8. Are objective and validated measurement methods used to measure the outcome?	yes	yes	can't tell	can't tell	can't tell	no	can't tell	yes	yes	yes
9. Is the size effect practically relevant?	yes	yes	yes	yes	yes	yes	yes	can't tell	yes	yes
10. How precise is the estimate of the effect? Were confidence intervals given?	no	no	yes	yes	yes	no	yes	no	yes	no
11. Could there be confounding factors that haven't been accounted for?	no	no	no	can't tell	no	can't tell	no	can't tell	no	yes
12. Can the results be applied to your organization?	yes	yes	yes	yes	yes	yes	yes	can't tell	yes	yes

Table 3 Quality Appraisal of the Included Cross-Sectional Studies with the Center for Evidence Based Management

Appraisal questions	Cusick et al., 2012	Häggman-Laitila et al., 2019	Häggman-Laitila et al., 2020	Liu et al., 2020	Mitchell et al., 2015	Toivonen et al., 2020
1. Did the study address a clearly focused question / issue?	yes	yes	yes	yes	yes	yes
2. Is the research method (study design) appropriate for answering the research question?	yes	yes	yes	yes	yes	yes
3. Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	yes	yes	yes	yes	yes	yes
4. Could the way the sample was obtained introduce (selection)bias?	no	no	no	can't tell	can't tell	no
5. Was the sample of subjects' representative with regard to the population to which the findings will be referred?	yes	yes	yes	yes	yes	yes
6. Was the sample size based on pre-study considerations of statistical power?	no	no	no	no	no	no
7. Was a satisfactory response rate achieved?	yes	can't tell	can't tell	can't tell	can't tell	can't tell
8. Are the measurements (questionnaires) likely to be valid and reliable?	yes	yes	yes	yes	can't tell	yes
9. Was the statistical significance assessed?	yes	can't tell	yes	no	no	yes
10. Are confidence intervals given for the main results?	no	no	no	no	no	no
11. Could there be confounding factors that haven't been accounted for?	no	no	yes	can't tell	can't tell	can't tell
12. Can the results be applied to your organization?	yes	yes	yes	yes	yes	yes

systematic review (McKenzie et al., 2022). At the beginning of the synthesis, the studies were read through several times, during which organized notes were made. After these notes were read through several times, data that were related to the research questions were identified from each study. Data related to the research questions were collected and

aggregated based on the type and prevalence of high-risk behavior (Table 5).

Table 4 Summary of Included Studies

Author(s), year, and country	Aim	Sample, design, and data collection	Data analysis	Results
Origin of the Data: The Midwest Evaluation of the Adult Functioning of Former Foster Youth ('The Midwest Study')				
Brown et al., 2015, USA	Longitudinally explore the relationship between remaining in foster care beyond age 18, behavioral health needs, and receipt of behavioral healthcare services.	N = 732 adolescents between the ages of 17 and 21, followed longitudinally while in, transitioning and after foster care. Quantitative study: surveys and in-person interviews.	Descriptive statistics were used to explore the trends in prevalence of behavioral health needs and behavioral healthcare service use over time.	34,7% of young people who were transitioning out of care reported having substance dependence symptoms. About one year later their percentage was 21,7%.
Courtney & Hook, 2017, USA	Assess longitudinally the relationships between extended foster care and educational attainment and economic well-being.	N = 732 adolescents, between the ages of 17 and 21, who transitioned to adulthood from foster care. Quantitative study: surveys and interviews.	Ordinal logistic regression was used to analyze youths' educational attainment, predicting attainment with covariates.	26% of the youth transitioning care had drug issues and 21% alcohol issues. Youth with drug issues at baseline had 34% lower odds of attaining the next higher level of education.
Cusick et al., 2012, USA	Examine a sample of foster youth at the onset of the transition to adulthood and explore how social bonds are related to the risk of arrest during adulthood.	N = 728 adolescents, between the ages of 17 and 18, who were or had been in foster care and gave consent to access their arrest records. Quantitative study: self-reported information, interviews, and official arrest data.	Competing risks regression analysis were used to identify predictors for each competing risk.	Between the ages 17–18 and 24, 46% of former foster youth experience an arrest. Arrests were evenly distributed across drug, nonviolent, and violent crimes columns.
Dworsky et al., 2013, USA	Estimate longitudinally the incidence of homelessness during the transition to adulthood and identify the risk and protective factors that predict homelessness during transition.	N = 624 adolescents who had entered foster care before age 16, were still in foster care at age 17, and had been removed home for reasons other than delinquency. Quantitative study: surveys and interviews.	Researchers used multivariate analysis to estimate the cumulative percentage of youths who become homeless during the transition to adulthood. They also estimate a discrete time hazard model to predict first reported episode of homelessness.	Six covariates were associated with a statistically significant increase in the relative risk of becoming homeless: running away while in foster care, greater placement instability, being male, a history of being physically abused, engaging more delinquent behaviors, and having symptoms of a mental health disorder.
Zinn et al., 2017, USA	Examine relationships between foster youths' individual characteristics, youths' social connections with individuals and formal institutions, and the development of perceived social support across the transition to adulthood.	N = 732 adolescents, between the ages of 17 and 21, followed longitudinally while in, transitioning and after foster care. Quantitative study: computer-assisted in-person interviews.	Mixed-effect growth models were used to examine the respective relationship between the level of perceived social support across the transition to adulthood and social connections.	Higher attachment insecurity, through its relationship with poor social and emotional competence and regulation, could have led to subsequent disruptive or delinquent behaviors.
Origin of the Data: Youth well - being, inclusion, activity, and services in aftercare services of City Division of Social and Health Care in Finland				
Häggman-Laitila et al., 2019, Finland	Discover how the different factors are associated with the coping abilities of young adults once aftercare services come to an end.	N = 568 Finnish adolescents, between the ages of 15 and 20, who had participated in aftercare services. Quantitative study: electronic customer/patient record systems.	The data were analyzed with BayesiaLab 7.0 tool which was used to identify connections between the variables.	Young adult's own heavy drinking behavior during teen years increases the likelihood of problems in relation to coping as a care leaver.
Häggman-Laitila et al., 2020, Finland	Describe the health behavior of Finnish young people who had left aftercare services by the end of April 2015.	N = 600 Finnish adolescents, between the ages of 15 and 20, who had participated in aftercare services. Quantitative study: electronic customer/patient record systems.	Data were analyzed using descriptive statistical methods. Statistical significance was tested using a chi-squared test.	45% of young people smoked regularly, 8% used snuff regularly, 10% reported having sexually transmitted disease and 69% engaged in substance use.

Table 4 (continued)

Author(s), year, and country	Aim	Sample, design, and data collection	Data analysis	Results
Toivonen et al., 2020, Finland	Describe the somatic and mental symptoms, medical treatments, and health service use of care leavers.	N = 600 Finnish adolescents, between the ages of 15 and 20, who had participated in aftercare services. Quantitative study: electronic customer/patient record systems.	Data were analyzed using descriptive statistical methods. Statistical significance was tested using a chi-squared test.	Substance abuses were reported by 11% of the care leavers, 2% had history of intoxication.
Origin of the Data: The National Youth in Transition Database (NYTD)				
Kelly, 2020, USA	Provide an analysis of the risk and protective factors contributing to homelessness among a nationwide sample of foster care youth at age 21.	N = 7082 adolescents, between the ages of 17 to 21, who were aging out of foster care. Quantitative study: data from database and foster care files.	Binary logistic regression was used to analyze the incidence of homelessness among the foster care youth.	At the age 21, 10.8% of the youth had been referred for substance abuse and 22.1% had been incarcerated.
Prince et al., 2019, USA	Estimate the impact of state and individual-level risk and protective factors on adverse 19-year-old outcomes among a cohort of transition age youth.	N = 7449 adolescents, between the ages of 17 to 19, who were aging out of foster care. Quantitative study: data from database and foster care files.	Data were analyzed assuming a two-level structure and logistic regression models were used to estimate outcomes using random coefficients.	At age 19, 14.4% of the sample had received a substance abuse referral and 22.4% had been incarcerated.
Shpiegel et al., 2020, USA	Identify unique patterns of functioning among adolescent mothers aged 19.	N = 777 adolescents, between the ages of 17 to 19, who were aging out of foster care. Quantitative study: data from database and foster care files.	Data were analyzed using the two-step cluster analysis produced five distinct clusters of functioning.	Risky behaviors were identified, such as substance abuse referrals and incarceration (substance abuse and incarceration clusters; 12% and 11%, respectively).
Shpiegel & Cascardi, 2018, USA	Evaluate the associations between childbirth at three time points and females' socioeconomic outcomes and risk indicators at age 21.	N = 3137 adolescents, between the ages of 17 to 21, who were aging out of foster care. Quantitative study: data from database.	Data were analyzed using descriptive statistical methods. To test hypothesis, chi-square tests and simple logistic regression analyses were performed.	Rates of homelessness and incarceration at age 21 were higher among females who had given birth, as compared to those who had not.
Origin of the Data: The Voices and Visions of Youth in Transition Survey				
Mitchell et al., 2015, USA	Examine the experiences and thoughts of youth as they transition out of foster care at the ages 17, 19, and 21.	N = 198 adolescents aged 17 years, who were aging out of foster care. Quantitative study: survey and interview.	SPSS and MAXQDA were used to examine the data using quantitative and qualitative analysis.	12.5% of males and 12.5% of females reported being confined in a jail, prison, correctional facility, or juvenile or community detention facility.
Origin of the Data: The three-year residential transitional living program in a state child welfare institute in China				
Liu et al., 2020, China	Examine the characteristics and wellbeing of aging out foster youth, including their socio-demographic characteristics, independent living skills, sources of stress, coping mechanisms, behavioral problems, and social support.	N = 65 adolescents, between the ages of 18 to 26, who were eligible for a residential transitional living program. Quantitative study: survey.	Descriptive analysis was conducted to present the profiles of these youth.	As an anti-stress mechanism 8.3% reported attacking others and 4.2% drinking excessively. As a problem behavior 20.8% reported risky sexual behavior, 12.5% harming others, 4.2% stealing and 2.1% destroying things.
Origin of the Data: Growth Beyond the Town- a longitudinal study on youth leaving care				
van Breda, 2020, South Africa	Report in a longitudinal perspective young people transitioning out of care and journeying towards adulthood.	N = 51 adolescents, between the ages of 13 to 21, who were leaving and left residential care. Mixed method study: An unstructured narrative interview, a structure interview and self-reported information.	Quantitative data were analyzed using descriptive statistics. For qualitative data, narratives extracts were used.	Three patterns were found: crime free care leavers that reported no criminal activity at least in two interviews (73% of the sample), those who reported "incidental crime" in one interview with the crime being low severity (10% of the participants), and those who reported regular crime in two or more follow-up interviews (18% of the participants).
Origin of the Data: Incarcerated Serious and Violent Young Offender Study (ISVYOS)				

Table 4 (continued)

Author(s), year, and country	Aim	Sample, design, and data collection	Data analysis	Results
Yang et al., 2017, Canada	Examine whether children and youth in care (CYIC) were disproportionately more likely than non-CYIC to show pattern of chronic offending and engage in more serious forms of crime.	N=364 adolescents, between the ages of 18 to 23, who have been incarcerated and 211 of them had history in foster care (CYIC). Quantitative study: data from database.	Multinomial logistic regression analysis was used to examine the relationship between placement in foster care and continued chronic offending.	CYIC status increased the odds of chronic offending between adolescence and adulthood. Finding may be gender specific.

Results

Characteristics of the Studies

The studies (N=16) were conducted in five countries: Canada (n=1); China (n=1); Finland (n=3); South Africa (n=1); and the United States (n=10). The studies employed cross-sectional and cohort designs, with some included longitudinal follow-up surveys and structured interviews. This review also includes one mixed methods study, but only the quantitative data were synthesized. Several of the included studies utilized the same data source, i.e., the 16 original articles report data from seven different sources. The studies described a total of five manifestations of high-risk behavior, namely, substance abuse (n=14), delinquency (n=12), sexual behavior (n=3), irresponsible use of money (n=1), and self-destructive behavior (n=1). The number of participants per study ranged from 51 to 7449 and included adolescents in aftercare services and/or adolescents who were transitioning from out-of-home care (Table 4).

Substance Abuse

Substance abuse was the most common form of high-risk behavior described in the included studies, with most of the adolescents who exhibited this type of behavior abusing alcohol and drugs (Table 5). Substance abuse among adolescents ranged from around 5% (Liu et al., 2020) to almost 35% (Brown et al., 2015). Most of the studies did not specify percentages of substance abuse for different illicit substances. Among adolescents in aftercare, 45% smoked, 8% used snuff, 67% abused alcohol, 34% used drugs, 28% smoked cannabis, and 9% reported abusing medications (Häggman-Laitila et al., 2020). Longitudinal studies in which adolescents became independent and transitioned from out-of-home care at different times showed a significant reduction in substance abuse over this time period (e.g., Brown et al., 2015).

Statistically significant connections were found between substance abuse and gender, number of placements, placement type, and reason for placement (Table 6). Substance abuse was generally more common among men than women

(Cusick et al., 2012; Häggman-Laitila et al., 2020; Prince et al., 2019; Toivonen et al., 2020), except in the study by Mitchell et al. (2015), i.e., substance abuse was more common among females than males. Diagnosed substance addiction or substance abuse was more common among adolescents who had been placed in out-of-home care three times or more than among adolescents who had been placed in out-of-home care once or twice (Häggman-Laitila et al., 2020; Toivonen et al., 2020). Shpiegel et al. (2020) divided the study population into different types of foster care to investigate substance abuse prevalence; accordingly, 17% of adolescents in relative foster care, 42.4% of adolescents in nonrelative foster care, 27.3% of adolescents in a group home or institution, and 13.6% of adolescents in other settings were found to demonstrate substance abuse (Shpiegel et al., 2020).

Moreover, Prince et al. (2019) found that both adolescents whose last placement had been in a group home or institutional setting and adolescents who had run away demonstrated elevated odds of substance abuse when compared to adolescents whose last placement had been non-relative foster home. Also, removal from home because of a child's behavioral or emotional problems elevated the odds of substance abuse.

Delinquency

Delinquency was the second most commonly reported form of high-risk behavior in the included studies (Table 5). In three studies, delinquency was divided based on manifestation and severity (Cusick et al., 2012; Liu et al., 2020; van Breda, 2020). Adolescents who had been placed in out-of-home care are at a 2.5 times greater risk of incarcerated relative to adolescents who have not been in out-of-home care (Yang et al., 2017); furthermore, each additional placement increases the risk for arrest by 4% (Cusick et al., 2012). The prevalence of delinquent behavior ranged from approximately 2% (Liu et al., 2020) to almost 45% (Cusick et al., 2012). Most of the included studies reported that almost one-quarter of care leavers had committed crimes or were incarcerated (Cusick et al., 2012; Kelly, 2020; Mitchell et

Table 5 The Forms and Prevalence of High-Risk Behavior in the Included Studies

Author(s), year	Substance abuse	Delinquency	Sexual behavior	Irresponsible use of money and self-destructive behavior
Brown et al., 2015	From 34.7% (at age 17) to 14.4% (at age 21)			
Courtney & Hook, 2017	26% used drugs, while 21% abused alcohol	A mean value of 4.33 on a scale from 0–14		
Cusick et al., 2012	19.6% had an alcohol or substance abuse diagnosis	46% had been arrested		
Dworsky et al., 2013	The odds ratio between becoming homeless and substance abuse was 0.983	The odds ratio between becoming homeless and delinquency was 1.121		
Häggman-Laitila et al., 2019a	19.9% abused alcohol or drugs			
Häggman-Laitila et al., 2020	45% smoked, 8% used snuff, 67% abused alcohol, 34% used drugs, and 9% abused medication		10% had sexually transmitted disease, 41% had been pregnant, 21% had had an abortion	
Kelly, 2020	10.8% abused substances	22.1% had been incarcerated		
Liu et al., 2020	4.2% drank excessively	12.5% attacked or harmed others, 4.2% stole, and 2.1% destroyed things or properties	20.8% had risky sexual behavior or lacked sexual knowledge	Financial literacy skills were comparatively low (4.29 out of 5)
Mitchell et al., 2015	Less than a quarter abused alcohol or drugs	25% had been convicted		
Prince et al., 2019	14.4% abused substances	22.4% had been incarcerated		
Shpiegel et al., 2020	12% abused substances	11% had been incarcerated		
Shpiegel & Cascardi, 2018	8.4% abused substances	The incarceration rate varied from 28.5% (at age 19) to 12.2% (at age 21)		
Toivonen et al., 2020	11% abused substances		10% had a sexually transmitted disease	2% had a history of intoxication
van Breda 2020		27% engaged in criminal activity		
Yang et al., 2017	Being in out-of-home care increased the odds of risk behavior such as substance abuse	Being in out-of-home care increased the odds of an earlier conviction, spending more time being incarcerated, and having a greater number of convictions		
Zinn et al., 2017		The average score for delinquent acts committed during the prior year was 0.41		

al., 2015; Prince et al., 2019; Shpiegel & Cascardi, 2018; van Breda, 2020).

Statistically significant connections between delinquency and background factors (gender, race, number of

Table 6 Statistically Significant Connections Between Background Factors and High-Risk Behavior

Background factor	Substance abuse	Delinquency	Other forms of risk behavior
Gender	More common among males than females (Cusick et al., 2012; Häggman-Laitila et al., 2020; Prince et al., 2019; Toivonen et al., 2020).	Male gender, as compared to female gender, increased the hazard rate for arrest by 100% (Cusick et al., 2012); females spend less time incarcerated and had fewer convictions than male (Yang et al., 2017).	Problems related to sexually transmitted diseases, sexual health and sexual behavior were more common among women than men (Häggman-Laitila et al., 2020; Toivonen et al., 2020).
Race		Being African American, as compared to being White, increased the hazard rate for arrest by 95% (Cusick et al., 2012).	
Number of placements	Adolescents who had been placed in out-of-home care three times or more were more likely to demonstrate substance abuse than adolescents who had been in one or two placements (Häggman-Laitila et al., 2020; Toivonen et al., 2020).	Multiple experiences of placements increased the hazard rate for arrest. Each additional placement resulted in a 4% increase in the hazard rate (Cusick et al., 2012).	Sexually transmitted diseases (Häggman-Laitila et al., 2020; Toivonen et al., 2020) and intoxication (Toivonen et al., 2020) was found to be most common among adolescents who had been placed in out-of-home care three times or more.
Placement form	Adolescents placed in group home or institutional settings, as well as adolescents who had run away, had elevated odds of substance abuse (Prince et al., 2019).	When compared to placement in a foster home, placement in a group home increased the hazard rate for arrest by 58% (Cusick et al., 2012). According to Prince et al. (2019), adolescents in a group home or institutional settings, as well as adolescents who had run away, showed elevated odds of criminal behavior.	
Reason for placement	Removal from home due to behavioral or emotional problems elevated an adolescent's odds of substance abuse (Prince et al., 2019).		
Other		Not having a biological mother was associated with a higher risk for arrest, as not having a living mother increased the risk for arrest by 64% when compared to instances in which the adolescents had a mother (Cusick et al., 2012). Childbirth at all time points increased the likelihood of incarceration (Shpiegel & Cascardi, 2018).	

placements, placement form, and other factors) were found (Table 6). For example, male gender increased the risk for arrest by 100% (Cusick et al., 2012); however, Mitchell et al. (2015) reported that the records show that half of the convicted adolescents were male, and the other half were female. Being African American, compared to being White,

increased the risk for arrest by 95% (Cusick et al., 2012), and similar associations were reported by Mitchell et al. (2015) and Shpiegel et al. (2020). Placement in a group home or institutional setting – relative to other care settings – increased the odds of delinquency (Cusick et al., 2012; Prince et al., 2019), while running away (Prince et al.,

2019), not having a biological mother (Cusick et al., 2012), and childbirth (Shpiegel & Cascardi, 2018) were also linked with an increased risk for crime. Zinn et al. (2017) reported that delinquency and attachment insecurity are negatively associated with social support.

Other Forms of High-risk Behavior

Adolescents' sexual health was described in three studies. Of these, two studies reported that 10% of the adolescents had a sexually transmitted disease (Häggman-Laitila et al., 2020; Toivonen et al., 2020). Problems related to sexually transmitted diseases, as well as sexual health and behavior, were more common among women than men (Table 6). Adolescents who had been placed in out-of-home care three or more times were more likely to have sexually transmitted diseases than adolescents who had been in out-of-home care fewer than three times (Häggman-Laitila et al., 2020). Lack of sexual knowledge and risky sexual behavior were reported by 20.8% of the adolescents transitioning of out-of-home care (Liu et al., 2020). The irresponsible use of money and self-destructive behavior was only described in one study (Table 5). Adolescents who were leaving out-of-home care demonstrated low levels of economic wellbeing; more specifically, they showed low financial literacy scores, which reflects difficulties in applying for welfare benefits, using public resources, budgeting, saving habits, being able to use debit and credit cards, and understanding the risk of online shopping (Liu et al., 2020). 2% of adolescent in aftercare reported having problems with intoxication, and this was more common among adolescents who had been in three or more placements (Toivonen et al., 2020).

Discussion

The knowledge base of high-risk behavior among care leavers is currently based on singular studies focusing on substance abuse, criminality, and suicidal behavior (Havlicek et al., 2013; Gypen et al., 2017; Kääriälä & Hiilamo, 2017). For this reason, knowledge on the topic remains sporadic. This review produced a comprehensive overview of the topic by synthesizing previous empirical evidence of how common high-risk behavior is among care leavers, how it manifests, as well as the associated factors. The information in the present review can help practitioners better understand why care leavers develop high-risk behavior, which offers new avenues for future research. This review identified five distinct forms of high-risk behavior, namely, substance abuse, delinquency, sexual behavior, irresponsible use of money, and self-destructive behavior. In contrast, previous reviews have only focused on the outcomes of substance abuse,

criminality, and suicidal behavior (Gypen et al., 2017; Havlicek et al., 2013; Kääriälä & Hiilamo, 2017), leaving other forms (e.g., irresponsible use of money) outside of the attention. In addition, none of the previous reviews reported associations between high-risk behavior and background factors, which was done in the current review.

When the findings of this review are compared with what has been reported in studies of high-risk behavior among all adolescents (e.g., Krause et al., 2022; Smith-Grant et al., 2022), it becomes clear that the research of care leavers' high-risk behavior is limited. Furthermore, the factors associated with high-risk behavior, risk behavior profiles, and causal relationships have been studied more comprehensively among general adolescents than the sub-population of adolescents in out-of-home care (Blankenstein et al., 2020; Goulet et al., 2020; Murray et al., 2021). This leads to the assumption that care leavers exhibit more forms of high-risk behavior than have currently been described due to multiple factors which can predispose them to high-risk behavior (Kobulsky et al., 2022). This shortcoming can be attributed to the fact that care leavers are a difficult group to manage and have commit to research.

However, comprehensive and longitudinal research among care leavers is crucial to increasing our understanding of the developmental trajectories and causal relationships of high-risk behavior in this group (Sariaslan et al., 2022). For example, it has been shown that age at the time of first arrest alters the developmental course of offending (with a younger age having a larger impact), and heightens involvement, frequency, and severity of offending throughout adolescence and early adulthood (Bersani et al., 2022). Also, the fact that substance abuse and delinquency were the most common forms of high-risk behavior in the identified studies emphasizes the need for a comprehensive research approach in the future.

The methodological challenge of research targeted to care leavers is the reliability of self-assessments of high-risk behavior. The self-evaluation of substance abuse via interviews and questionnaires raises concerns about the accuracy of the prevalence and incidence of this behavior due to the provision of socially desirable responses (He et al., 2015). Although surveys and interviews were also used to examine delinquency, official arrest data and registry data were used to strengthen the credibility of the results. Thus, while it is important to pay attention to the authentic expressions of vulnerable adolescents (Dixon et al., 2019), more registry data should be utilized in the research to strengthen the reliability of results and produce generalizable conclusions. Furthermore, the use of registry data enables the authentic description of reality in terms of what services are offered and what adolescents' needs are without the risk of socially desirable answers. It is also noteworthy that the incidence of

high-risk behavior varied noticeably between the identified studies, a dynamic which may be explained by sample size, study design, or cultural considerations (e.g., Ferrer-Wreder et al., 2014).

Approximately half of the studies included in this review described associations between background factors and the prevalence of high-risk behavior, of which some were statistically significant. For example, being male, being placed in out-of-home care three or more times, having been placed in a group home or institutional setting, having run away, and being placed into out-of-home care because of behavioral or emotional problems were connected to a higher risk of substance abuse. These findings are in line with what was reported by Scannapieco et al. (2016) in that the quality of life among adolescents who grew up in out-of-home care was found to be related to type of placement and the number of placements. As high-risk behavior influences an adolescent's development and quality of life, it would be important to identify the possible connections between background factors and high-risk behavior in order to know how to best support the development of this vulnerable population. The majority of care leavers are resilient and have sufficient mental resources to overcome the challenges they face (Shpiegel et al., 2022); therefore, research on risk behavior should also focus on associations between care leavers' protective factors and high-risk behavior. Further factors that have been established to enhance the quality of life include educational status, psychological health, and behavioral disorders (e.g., de Oliveira Pinheiro et al., 2022). However, these factors were not examined in the included studies.

It should be noted that previous research has focused on examining how an adolescent's current socio-economic situation (i.e., housing, and financial situation) affects the prevalence of high-risk behavior. This type of focus means that a care leaver's childhood life situation and development fall outside of the scope of research. This is not a reliable approach, as both features largely impact an adolescent's development. Thus, care leavers should always be studied from a holistic perspective, which can be expected to enhance the knowledge base for future service development.

Implications for Future Research and Service Policy

The findings of this review serve as a foundation for further research; more specifically, there should be a focus on the comprehensive identification of various forms of high-risk behavior among adolescents in order to gain insight into how adolescents' healthy development can be supported and how high-risk behavior can be effectively mitigated. Moreover, research should focus on identifying the connections between high-risk behavior and background factors among

care leavers using a variety of data sources, large sample sizes, and distinct research methods, all while taking into account the cultural context. The comprehensive identification of which background factors influence high-risk behavior will provide important information that can be used as a guide for future research, preventive work (via multi-professional collaboration), and policy-makers who can influence the conditions and services provided to out-of-home adolescents. Furthermore, knowledge about an adolescent's high-risk behavior (including forms and prevalence) and background will increase our understanding of adolescents' development, high-risk behavior prevention and reduction, as well as adolescents' needs. This comprehensive overview provides clear guidelines for how vulnerable adolescents can be provided with the correct type of holistic support. When discussing holistic and humane encounters, it is also relevant to examine the resources and protective factors of at-risk adolescents for the best possible chance of preventing these behaviors.

Strengths and Limitations

The strengths of this review are connected to the expertise of the research group and an information specialist at the library. A total of four researchers conducted the research, with two selecting data in every phase and appraising the quality of studies according to validated protocols (Centre for Evidence-Based Management, 2014), while the remaining two researchers supervised the data selection and appraisal phases to confirm accuracy. The inclusion of an information specialist from a library ensured that the search process was systematic and inclusive. A total of six databases were screened for relevant research to obtain a comprehensive overview of the topic. Detailed descriptions of the data retrieval and selection methods increase the transparency of the review.

The limitations of this review were predominantly connected to the gathered data. The identified studies had a rather limited focus: substance abuse and delinquency among adolescents in out-of-home care. The associations between high-risk behavior and background factors were poorly reported, with results on associations limited to a few original studies – mainly originating from the United States – which only drew upon seven individual datasets. These aspects diminish the value of the provided overview of high-risk behavior among care leavers. It should also be stated that most of the presented evidence is of low quality due to weak study designs. The decision to not screen gray literature for relevant research can be considered an additional limitation of the review.

Conclusion

This systematic review gathered the identified forms, prevalence, and associated factors of high-risk behavior among care leavers from previously published research. A total of five distinct forms of high-risk behavior were identified among these adolescents, namely, substance abuse, delinquency, sexual behavior, irresponsible use of money, and self-destructive behavior. Substance abuse and delinquency were the most commonly reported forms of high-risk behavior, with the former mentioned in fourteen studies and the latter mentioned in twelve studies. Adolescents' sexual behavior were described in three of the articles, while irresponsible use of money and self-destructive behavior were each reported in one study. The included studies provided varying accounts of the incidence of high-risk behavior, which could be attributed to cultural considerations, study design, or sample size. Associations between background factors and high-risk behavior were described in approximately half of the studies, with some findings achieving statistical significance. For instance, gender, race, reason(s) for placement, and the form and number of placements were reported to exert a significant effect on high-risk behavior. Although this review provides an overview of high-risk behavior among care leavers, the topic remains limited. As this review was based on previously reported results, the data and sampling approaches of the included studies could not be influenced. As a result, the data sets underlying the original research focused on only a few forms of high-risk behavior and mean that the present review paints a rather one-sided view of the topic. Moreover, many of the studies adopted a socio-economic perspective when describing the effects of high-risk behavior on care leavers, which does not consider how the past shapes care leavers' behavior. Identifying the underlying causes of high-risk behavior is critical to supporting the growth and development of these adolescents in a way that does not include high-risk behavior.

Authors' Contributions UKP contributed to the study conceptualization and design, performed the literature search, selection of articles and quality appraisal, and drafted the first manuscript; SK participated in the study conceptualization and design, and performed the literature search, selection of articles and quality appraisal; ATM contributed to the study conceptualization and design, and critically revised the manuscript; AHL participated in the study conceptualization and design, and critically revised the manuscript. All authors read and approved the final manuscript.

Funding Open access funding provided by University of Eastern Finland (UEF) including Kuopio University Hospital.

Declarations

Conflict of Interest The authors report no conflicts of interest.

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