

Emergency consultations for male adolescents: Somatic and psychological characteristics and profiles of regular users. A retrospective chart review

A. Forestier^{a, b, *}

aline.forestier@unil.ch

M. Gehri^c

O. Guilbaud^d

A.S. Ramelet^a

^aUniversity institute of higher education and research in healthcare, Biopôle 2, route de la Corniche 10, 1010 Lausanne, Switzerland

^bSchool of health sciences, Avenue de Champel 47, 1206 Geneva, Switzerland

^cDepartment woman, mother, child, University Hospital of Lausanne, Rue du Bugnon, 1010 Lausanne, Switzerland

^dUniversity hospital of Lausanne, service universitaire de psychiatrie de l'enfant et de l'adolescent (SUPEA), 1010 Lausanne, Switzerland

*Corresponding author at: IUFRS, Route de la Corniche 10, Lausanne, 1010, Switzerland.

Published in *Archives de Pédiatrie*, 2019, vol. 26 no. 7, p. 393-399 which should be cited to refer to this work
DOI: 10.1016/j.arcped.2019.08.009

Abstract

Introduction

Male adolescents' mental health has been understudied compared to their female counterparts and is not well known among health professionals. This is particularly problematic in emergencies because the number of such patients is increasing.

Objectives

To identify the type of demand for care and the characteristics of male adolescents' emergency room visits. To describe the sociodemographic data and clinical characteristics of regular users.

Method

This is a retrospective study of all medical records of male adolescents aged 14–18, admitted between 2014 and 2015 to the pediatric emergency room of a Swiss university hospital. Sociodemographic and clinical data (e.g., degree of urgency, diagnosis, length of stay, emergency service use, and emergency discharge destinations) were collected. Descriptive and multivariate analyses were performed using STATA 13.1 software.

Results

Over the 2-year study period, 2045 male adolescents consulted in emergency departments for a total of 3199 admissions. The average age was 15.6 years (SD, 1). Most consultations were non-urgent (93%) and the reasons included musculoskeletal (43%), dermatological (13%), and digestive (10%) complaints. Forty-two male adolescents (2%) had four or more visits within the 2-year period and were considered regular users; they were also more likely to have psychological complaints (adjusted OR, 5.04; 95% CI, 1.81–13.72) and comorbidities (adjusted OR, 2.55; 95% CI, 1.25–5.21) when compared to their counterparts with fewer than four visits.

Conclusion

Since regular users are at greater risk of having psychological complaints and comorbidities during their first emergency room visit, a systematic assessment of these adolescents' mental health levels and overall health indicators is recommended.

Keywords: Adolescent; Pediatric emergency medicine; Nursing care; Health service; Mental health

1 Introduction

Male adolescents are at risk of developing mental disorders that can appear in early adolescence. However, most of these disorders in adolescents go unnoticed and untreated, which can result in serious consequences for their mental health and future quality of life [1]. Previous studies on the sociodemographic and clinical characteristics of adolescents in PEDs have provided results that were undifferentiated in terms of gender, were heterogeneous in terms of age, and limited the extraction of specific observations for boys

[2–7]. Boys manifest their mental illness or suffering differently from girls [8] and most of these signs are undetected by caregivers [9]. When boys have psychological or health problems, they commonly do not want to talk about them [10], express them by accident [11] or manifest somatic complaints [12] and/or use care facilities infrequently or at a late stage [8]. Studies have shown that although most boys are in good general health, many of them consider their health to be poor [13]. In Switzerland, a significant proportion of them report that they need help solving psychosocial and relational problems related to stress (28.5%), depression (18.9%), their emotional life (22.4%), their professional and school life (23.2%), and health problems related to the abuse of psychoactive substances, including tobacco (21.6%), alcohol (10.5%), and drugs (9.8%) [10]. Stress factors are the main risk factors for suicide, and boys die four times more often than girls by suicide [1]. In addition, boys are more likely to seek thrills to let off steam (75%) and to test their physical and psychological limits (44.3%), and they are attracted to dangerous situations (42%) and sports (47.7%) [10].

Therefore, primary prevention of psychological distress in boys is essential. Schools are a privileged place of prevention, but when malaise or psychological suffering manifests itself in somatic forms, pediatric emergency departments (PEDs) are a common place to turn to and seem to be the ideal place to detect psychological disorders early and set up specific universal prevention measures.

Adolescents account for nearly 20% of the population using PEDs [2,3], and nearly half are boys [14,15]. A small proportion of them visit a PED four or more times per year [3]. Considered regular users [16], they are known to be socially and medically more vulnerable, especially if they present with psychiatric symptoms [14,17].

We hypothesize that boys who regularly visit PEDs for somatic reasons are more likely to also report psychological complaints. This hypothesis, if shown to be true, will justify early mental health assessment in adolescents who present in emergencies. The results of this study will help better understand the reasons why they come to the emergency room and what their orientations are.

The purposes of this study were to:

- identify the nature of the demand and characteristics of boys' emergency consultations;
- describe the sociodemographic data and clinical characteristics of male regular users.

2 Materials and methods

2.1 Context

This retrospective review of medical records of clinical and administrative data was carried out at the PED of a university children's hospital in Switzerland. This hospital serves a city of 200,000 inhabitants and has the only pediatric emergency center in the city. The emergency department admits more than 35,000 cases per year and serves as a reference center for pediatric emergencies in the metropolitan region, except for vital emergencies, which are directly referred to the city's university hospital center [18]. After approval by the Cantonal Ethics Committee on Human Research and anonymization of the data, all of the medical files of boys aged 14–18 years old, who consulted the PED between 1 January 2014 and 31 December 2015, were obtained.

2.2 Research variables

Three types of variables were collected:

- sociodemographic variables, including age, sex, and continent and country of origin;
- clinical variables, including the Australasian Triage Scale (ATS) (degree of emergency) [19] and reasons for consultation according to the International Classification of Primary Care Version 2 (ICPC-2) [20];
- consultation characteristics, including the date and time of consultation admission, emergency waiting time, recurrent visits, referrals, and destinations after ED discharge.

The reasons for consultation were coded according to the ICPC-2 by the first author (AF) and a research assistant for all admissions; the codes were compared and a final choice was made.

2.3 Statistical analyses

One-dimensional descriptive analyses were used to describe the clinical variables and characteristics of the boys' consultations. The analyses examined the relationships between sociodemographic variables (age, continent of origin), clinical variables (ATS levels at triage, presence of comorbidity, reasons for consultation), and the fact of having consulted the PED four or more times during the year. The unadjusted odds ratio (OR) for each explanatory variable was calculated, and the significance threshold used was $\alpha = 0.05$. All variables with $P \leq 0.20$ were included in an initial multivariate logistic regression model. Adjusted ORs were calculated for each association between variables retained within the model. Variables with $P \leq 0.05$ were removed one by one from the model. At each step, the area under the receiver operating characteristic (ROC) curve was calculated to verify the model's sensitivity and specificity. These analyses made it possible to build the most efficient explanatory model of logistic regression. All statistical analyses of the data were carried out using Stata 13.1 software (2013).

3 Results

3.1 Sociodemographic variables

During the years 2014 and 2015, consultations of adolescents aged 14–18 years accounted for 10.4% of total admissions to PED ($n = 6425$) (Fig. 1). Of these, half were boys ($n = 3199$; 49.8%), for a total of 2,045 patients, with an average age of 15.56 years (SD, 1.06). The boys:

- for the most part came from Europe ($n = 2723$; 85.1%), including 61.4% Swiss ($n = 1672$);
- 6.2% ($n = 222$) were African;
- came from the Americas ($n = 128$, 4%), with 88.3% ($n = 113$) South American;
- iv) 3.8% ($n = 123$) came from Asia-Oceania.

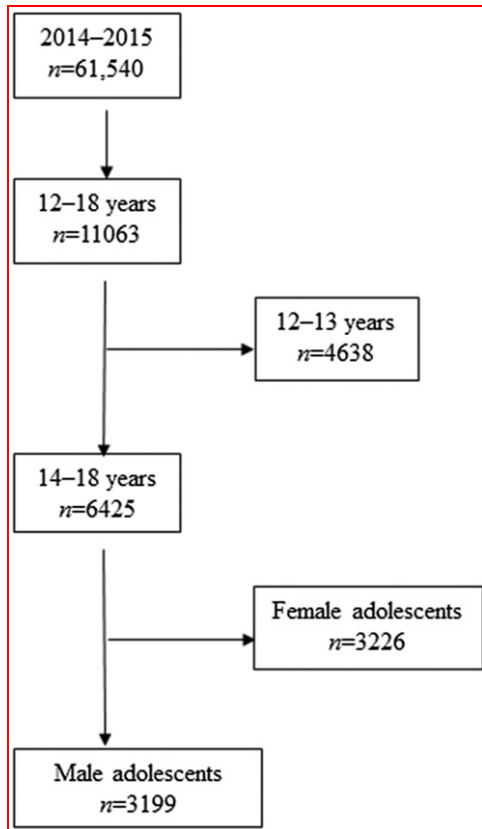


Fig. 1 Flow chart. PED: pediatric emergency department.

3.2 Clinical variables

3.2.1 Clinical evaluation at triage

At triage, the majority of the boys admitted (93%, $n = 2968$) had a nonurgent or semiurgent clinical condition (ATS triage score 4 or 5).

3.2.2 Reasons for consultation

The top five reasons for consultation on the CISP-2 classification were complaints or symptoms of the following systems:

- musculoskeletal ($n = 1366$; 42.8%);
- dermatological ($n = 412$; 12.9%);
- respiratory ($n = 386$; 12.1%);
- digestive ($n = 324$; 10.1%);
- neurological ($n = 150$; 4.7%).

Complaints or symptoms of psychological suffering concerned 2.7% ($n = 85$) of the boys consulting at the PED. The distributions of age and the reasons for consultation distributions were significantly different ($P = 0.000$) (Fig. 2).

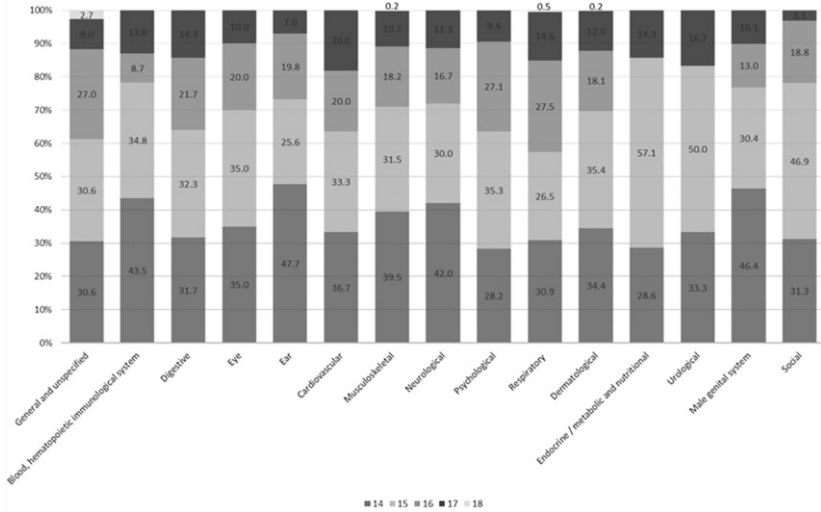


Fig. 2 Distribution of reasons for consultations by age (%) ($n = 3199$).

Of the 1369 (42.8%) consultations for musculoskeletal reasons, 1112 (34.8%) were related to traumatic injuries. In addition, there were dermatological complaints related to traumatic skin lesions ($n = 230$, 7.2%); of these, 3.7% ($n = 118$) were related to cuts or lacerations and 2.2% were related to bruises, contusions, or scrapes. At the digestive level, 150 (4.7%) consultations corresponded to abdominal or epigastric pain, and 68 (2.1%) consultations were for symptoms related to gastrointestinal infections. At the respiratory level, the requests for care concerned infectious problems ($n = 225$, 7%). Neurological complaints included concussions ($n = 53$, 1.7%) and headaches ($n = 39$, 1.22%). At triage, 85 (2.7%) boys were admitted for psychological reasons; among their requests, 19 (0.6%) showed symptoms of anxiety, 18 (0.7%) showed suicidal thoughts or behaviors, and 13 (0.4%) showed alcohol or drug abuse. Of the 2% ($n = 63$) of the boys who presented a life-threatening or imminent organic failure (ATS 2) at the time of triage, most presented musculoskeletal complaints ($n = 29$, 46%), respiratory complaints ($n = 12$; 19.1%), complaints related to the male reproductive system ($n = 7$; 11.1%), or psychological complaints ($n = 4$; 6.3%).

3.2.3 Variables of consultation characteristics

The numbers of consultations for boys between 2014 ($n = 1581$) and 2015 (1618) were almost equivalent and showed variations by month, with a decrease in consultations during the summer. More boys attended the PED on Mondays ($n = 529$; 16.5%), Thursdays ($n = 498$; 15.6%), and Tuesdays ($n = 491$; 15.3%). Half of the boys' consultations were between 12 pm and 7 pm (median, 4 pm).

3.2.4 Duration of care

The median time the boys spent in total care at the PED was 135 min (IQR = 94 min), and the median time in the waiting room was 46 min (IQR = 71.5 min). After the nurse set up a care room, the median time before the medical consultation was 10 min (IQR = 20 min).

3.2.5 Orientation

Following their admission to the PED, most boys ($n = 2676$; 83.6%) returned home and were referred to their attending physician, while 7.3% ($n = 234$) were hospitalized. It should be noted that 2.7% ($n = 87$) of the boys admitted to the PED left before installation in the care room (Fig.

3).

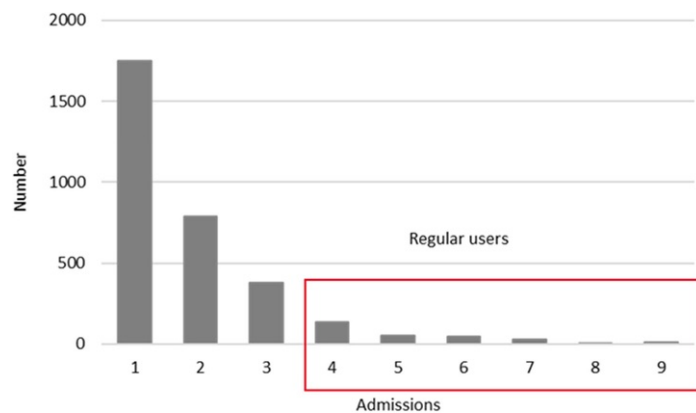


Fig. 3 Number of admissions to PED per year between 2014 and 2015 ($n = 3199$). PED: pediatric emergency department.

3.2.6 Recurring visits and regular users

Between 2014 and 2015, the average number of admissions was 1.84 (SD, 1.28), with a maximum of nine consultations per year (Graph 2). Of the 2045 boys who had consulted at the PED, 2% ($n = 42$) were considered regular users, since they had come four times or more per year. Most of them come from Europe and more particularly from Switzerland ($n = 22$; 64.7%). All regular users from the Americas came from South America: Brazil ($n = 2$), Colombia ($n = 2$), and Ecuador ($n = 1$). Boys who came from Africa were from Eritrea ($n = 1$), Algeria ($n = 1$), and Guinea ($n = 1$). At their first consultation between 2014 and 2015, they were mainly admitted for musculoskeletal, respiratory, dermatological, psychological, and digestive complaints. Of these patients, most regular users did not report comorbidities during the triage assessment. The reported comorbidities on the first visit to PED were allergies, a history of musculoskeletal injuries or trauma and unspecified surgical procedures, asthma, infectious pathologies, or sequelae of neurological infections, social reasons, or psychiatric symptoms (Table 1).

Table 1 Sociodemographic variables, reasons for consultations and comorbidity characterizing regular ($n = 42$) and nonregular users ($n = 2003$).

Characteristics	Regular users n (%)	Non-regular users n (%)
Age group		
14 years old	24 (57.4)	844 (42.1)
15 years old	10 (23.8)	607 (30.3)
16 years old	6 (14.3)	345 (17.2)
17 years old	2 (4.76)	192 (9.6)
18 years old	—	7 (0.4)
Continent of origin		
Africa	3 (2.1)	140 (7)
Americas	5 (11.9)	70 (3.5)
Asia-Oceania	—	88 (4.4)
Europe	34 (81)	1703 (85.2)

Reason for consultation		
Blood, hematopoietic immunological system	1 (2.4)	14 (0.7)
Digestive system	3 (7.1)	176 (8.8)
Ear	2 (4.8)	62 (3.1)
Musculoskeletal	15 (35.7)	900 (44.9)
Neurological	1 (2.4)	107 (5.3)
Psychological	5 (11.9)	45 (2.3)
Respiratory	7 (16.7)	235 (11.7)
Dermatological	6 (14.3)	262 (13.1)
Male genital system	1 (2.4)	46 (2.3)
Eyes	–	13 (0.7)
Cardiovascular	–	10 (0.5)
Endocrine/metabolic and nutritional	–	6 (0.3)
Urological	–	11 (0.6)
Comorbidity		
No comorbidity	31 (73.8)	1,787 (89.2)
Unspecified surgical procedures	1 (2.4)	18 (1)
Asthma	1 (2.4)	55 (2.7)
Allergies	3 (7.1)	41 (0.1)
Infectious disease	1 (2.38)	7 (0.35)
Psychological troubles	1 (2.4)	11 (0.6)
Musculoskeletal injuries or trauma	2 (4.8)	8 (0.4)
Neurological infections and epilepsy	1 (2.4)	14 (0.7)
Social reasons and aggression	1 (2.4)	1 (0.1)
Diabetes and metabolic disease	–	15 (0.8)
Digestive pathology	–	5 (0.3)
Cardiac pathology	–	12 (0.6)
Kidney or urinary pathology	–	5 (0.3)
Cancer and genetic disease	–	6 (0.4)
Disability	–	13 (0.7)
Dermatological disease	–	2 (0.1)
ENT and respiratory pathology	–	6 (0.3)
Male genital system	–	1 (0.1)

ENT: ear, nose, and throat. Missing values: non-regular users - age group ($n = 8$), continent of origin ($n = 2$), comorbidity ($n = 7$).

The univariate logistic regressions of the sociodemographic and clinical variables used in this study are presented in [Table 2](#).

Table 2 Relationships between the sociodemographic and clinical variables for regular users ($n = 42$).

alt-text: Table 2

Characteristics	Unadjusted OR	<i>P</i>	95% CI
Age	0.76	0.108	0.56–1.06
Presence of comorbidity	2.80	0.004	1.40–5.66
ATS level of triage			
ATS4	2.41	0.011	1.22–4.78
ATS5	1 (Réf)		
Continental origin			
Africa	1.07	0.907	0.32–3.54
Americas	3.57	0.01	1.36–9.42
Europe	1 (Réf)		
Reason for consultation			
Blood, hematopoietic immunological system	3.46	0.23	0.44–26.97
Digestive	0.79	0.71	0.24–2.61
Ear	1.56	0.54	0.37–6.62
Musculoskeletal	0.68	0.23	0.36–1.29
Neurological	0.43	0.40	0.059–3.17
Psychological	5.87	< 0.001	2.21–15.66
Respiratory	1.50	0.33	0.66–3.43
Dermatological	1.10	0.81	0.46–2.65
Male genital system	1.03	0.97	0.14–7.70

ATS: Australasian triage scale; OR: odds ratio; CI: confidence interval.

The explanatory variables used in the logistic regression model were the Americas as the continent of origin, the reason for psychological consultation, and the presence of a comorbidity announced during triage. Compared to boys with fewer than four recurrent visits per year, regular users were significantly more likely, at their first visit, to report psychological complaints (adjusted OR, 5.04; 95% CI, 1.84–13.72), to report a comorbidity (adjusted OR, 2.55; 95% CI, 1.25–5.21), and to be from the American continents (adjusted OR, 3.45; 95% CI, 1.29–9.21).

4 Discussion

To our knowledge, this study is the first to characterize the sociodemographic and clinical profiles of boys who are considered regular users of a PED. We examined the reasons for admission and the characteristics of their consultations.

This study confirmed our hypothesis. Proportionally to all consultations of boys per year at the PED, few qualified as regular users (2%). Of these, almost one-third reported a comorbidity, of which musculoskeletal, respiratory, dermatological, psychological, and digestive complaints were the most common. To our knowledge, no studies have explored the clinical characteristics of regular male users' consultations. The results reveal that adolescents who use PEDs regularly must be considered a vulnerable population, given the complexity of their social, mental, and somatic situation [3,14].

Our multivariate model showed that boys who presented with psychological problems at their first PED consultation were five times more likely to be regular users during the year. In addition, if the reason for the first consultation was related to psychological

complaints, the subsequent reasons for PED consultation could be quite different (including musculoskeletal, digestive, respiratory, or dermatological), and vice versa. Although accounting for a small number of patients, repeated demand for somatic intervention is linked to psychological distress. As with girls who present with psychological complaints, who more likely to be regular users of PEDs [14,21], our results show how essential it is to also be attentive to boys' care demands and not to focus solely on explicit requests. In addition, this study found that a boy who reported at least one comorbidity during triage was almost three times more likely to be a regular user. A previous study had already identified this association between the presence of comorbidities, chronic diseases, and repeated consultations [22]. Presenting psychological complaints and announcing a comorbidity during the first consultation at the PED are therefore clearly two risk factors for recurrent visits to the PED. These two risk factors show how closely the physical and mental health of boys are interrelated. Our results echo those of previous studies that linked physical and psychological symptoms: adolescents suffering from chronic illnesses were more depressive and suicidal [17,23,24]. Finally, there was a strong relationship between the presence of somatic disorders in adolescence and the emergence of mental disorders in adults, such as psychotic, anxiety, bipolar or somatoform disorders [25]. Thus, suicidal behavior in adulthood was over-represented among adolescents who suffered from depression and had more than five somatic complaints [25]. These last elements show how much the demands of adolescent care impact the development of adolescent boys and their future adult life. As recommended by Burstein et al. [26], our results confirm the importance of implementing mental disorder prevention programs through the integration of physical and mental health care within PEDs. Boys from the Americas were more likely to return to the PED within the year. Given the sociodemographic results, most of these adolescents came from South America. A previous report noted that, in Switzerland, 50% of illegal immigrants were from Latin America [27] and that children and adolescents of Latin American origin without residence permits mainly consulted at PEDs [28]. The latter benefit from free care at PEDs. In the absence of health insurance, there is still considerable doubt as to follow-up on prescriptions upon leaving the PED [29], which could explain the recurrence of visits. We hypothesize that the precarious administrative status of these minor adolescents constitutes significant vulnerability and impacts the use of PEDs, which remain a favorable place for primary care because of their accessibility and the multidisciplinary care offered with the support of a translator-mediator.

Overall, boys accounted for almost half of the adolescents aged 14–18 visiting PEDs. These results are similar to the ratio of the general population of adolescents in Switzerland (sex ratio, 1.06) [29] and Europe (sex ratio, 0.92–1.30) [4,5,7,15]. The temporal analysis of boys' consultations is consistent with other studies [4,6] and reflects an increased demand for consultations during the school period. This observation should make us aware of the place occupied by schools and their stressors on requests for consultations at PEDs and their involvement in boys' mental health. [30]. Most of the boys admitted had nonurgent reasons for consultation, which is close to what has been observed in France [4]. More than three-quarters of the boys in the present study returned home and were referred to their primary care physician following their care at the PED. This trend, which other studies have also demonstrated [4,5], highlights the accessibility of Swiss health services [13]. The PED in our study belongs to a university center located in the city and thus facilitates access to healthcare. The results show how much PEDs, like consultations with general practitioners, are a key gateway to primary care for this population. The proportion of drop-outs corresponded to the drop-out rates among the general population and was slightly higher than those reported in other studies conducted on adolescents (0.7–2.2%) [4,5]. The length of time between triage and admission to the consultation room may discourage some boys with a low degree of urgency and encourage them to leave the emergency room before being seen by a medical doctor. Compared to other studies including samples similar to ours, the adolescents in this study had fewer musculoskeletal complaints [4,5,7,15] and traumatic injuries related to sports accidents [8]. They had more dermatological, digestive, and respiratory complaints [2,4,5,15]. The proportions of neurological (concussions, headaches) and psychological (anxiety, suicidal thoughts) complaints were similar to those observed in previous studies [2,3,15]. At triage, 12% of the boys in our study reported a comorbidity. This proportion is close to that observed in a retrospective study characterizing the use of PEDs by children and adolescents with chronic diseases [22]. These results show the specificity of the clinical profile of boys, who present to the PED and that somatic reasons prevail over psychological and social reasons for admission. However, the disparity in these results compared with those observed in previous studies can be explained by the diversity of data-collection procedures and their coding. Most of them were prospective and used collection tools or output diagnostic coding from the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM). The CISP-2, used in our study, is consistent with the International Classification of Diseases Ten (ICD-10) and allows for different coding of the reasons for consulting male adolescents.

4.1 Strengths and limitations

This study is the first to identify the many explanatory variables of boys' consultations at PEDs and the risk factors for recurrent visits to PEDs. These results are reinforced by the size of the sample ($n = 3199$).

This study has several limitations mainly related to its retrospective design. Indeed, the retrospective data did not allow us to collect certain variables recognized as indicators of overall health and quality of life (including differences between the reason for consultation and the discharge diagnosis, body mass index, stress factors, and leisure). While the use of HEADSS (home, education, alcohol, drugs, smoking, sex) is recommended to PEDs, psychosocial data were not part of the routine data. This would have allowed us to clarify the clinical and psychosocial profiles of these boys and to compare the reasons for consultations with the medical diagnoses chosen at the end of the consultations at the PED. Second, this study used retrospective data from a single PED. The results may be underestimated because of the missing sociodemographic and clinical data. However, variables with missing data were excluded from the statistical analyses. Third, consultation of the 42 files of the regular users would have allowed us to more accurately analyze their clinical profiles and the characteristics of the consultations. Given the retrospective design, anonymization of data, and ethical constraints at the beginning of the study, it was not feasible to seek consent from the 2045 boys who had consulted the PED between 2014 and 2015. Fourth, no systematic assessment of mental health was implemented at the study site, contributing to an under-determination of the symptoms of psychological suffering as well as the absence of identification of the type of psychological disorders. Finally, the study did not identify whether boys referred to their attending physician had actually contacted their physician.

4.2 Recommendations

The diversity of reasons for boys consulting the PED and the risk factors identified for regular users suggest the importance of systematically assessing the mental health of boys who present themselves to PEDs for somatic and/or psychological complaints. Implementation of a systematic screening of mental health would require being accompanied by research on the feasibility and acceptability among boys and health professionals at PEDs. In addition, this approach could be complemented by a prospective study of global health indicators, quality of life, and psychosocial data from HEADSS with all male consultants at a PED. The results of this study support the importance of thinking globally about care for boys and of integrating the care provided at PEDs into the adolescents' overall care

pathway, while considering their continental origin and administrative status. The median time for care at the PED was 135 min, with 46 min of waiting time between sorting and installation in the care room and 10 min between installation and medical consultation. It seems important to us that these attendance times at the PED be devoted to targeted prevention interventions. In addition, we recommend establishing a good-quality contact with the attending physician following the consultation at the PED and exploring the causes of disruptions in care after the PED visit and in the health follow-up.

5 Conclusion

This study confirms our hypothesis that regular male users were at greater risk of presenting psychological complaints and reporting a comorbidity at their first visit to the PED. It establishes the diversity of the profiles and demands for care of boys at the PED and the clinical particularity of regular users. This study demonstrates the importance of carrying out universal prevention actions with boys who are consulted at PED and of systematically identifying the levels of mental health, overall health indicators, and quality of life of boys who use PEDs regularly.

Funding

None.

Disclosure of interest

The authors declare that they have no competing interest.

Acknowledgements

This study was supported by the HES-SO University of Applied Sciences and Arts Western Switzerland, School of Health Sciences, Geneva, Switzerland.

The authors would like to thank Shadya Yalazoglu, research assistant, for her invaluable assistance in coding the reasons for consultation, and Pierluigi Ballabeni for the support during the statistical analyses and writing the results.

References

- [1] Organisation Mondiale pour la Santé. La santé pour les adolescents du monde: une deuxième chance pour la deuxième décennie Genève 2014 [updated 31.12.2018. Available from: http://apps.who.int/adolescent/second-decade/files/WHO_FWC_MCA_14.05_fre.pdf.
- [2] E.R. Alpern, R.M. Stanley, M.H. Gorelick, et al., Epidemiology of a pediatric emergency medicine research network: the PECARN Core Data Project, *Pediatr Emerg Care* **22**, 2006, 689–699.
- [3] E.R. Alpern, A.E. Clark, E.A. Alessandrini, et al., Recurrent and high-frequency use of the emergency department by pediatric patients, *Acad Emerg Med* **21**, 2014, 365–373.
- [4] P. Velin, H. Alamir, P. Babe, et al., Les adolescents aux urgences de l'hôpital Lénval pour enfants à Nice en 1999, *Arch Pediatr* **8**, 2001, 361–367.
- [5] C. Stheneur, M. Sznajder, C. Guyot, et al., Les urgences, un lieu de repérage des adolescents en difficulté, *Arch Pediatr* **21**, 2014, 593–600.
- [6] M.A. Podlipski, A.C. Peuch, V. Belloncle, et al., Accueil en urgence des adolescents pour motif pédopsychiatrique, *Arch Pediatr* **21**, 2014, 7–12.
- [7] P. Vic, E. Ramé, A. Robert-Dehault, et al., Repérage des conduites à risque et des symptômes dépressifs chez les adolescents admis en service d'accueil des urgences, *Arch Pediatr* **22**, 2015, 580–594.
- [8] A.V. Marcell, J.D. Klein, I. Fischer, et al., Male adolescent use of health care services: where are the boys?, *J Adolesc Health* **30**, 2002, 35–43.
- [9] V.A. Downey and L.S. Zun, Identifying Undiagnosed Pediatric Mental Illness in the Emergency Department, *Pediatr Emerg Care* **34**, 2018, e21–e23.
- [10] Narring F, Tschumper A, Inderwildi Bonivento L, et al. SMASH-02: Santé et styles de vie des adolescents âgés de 16 à 20 ans en Suisse 2004 [updated 31.12.2018. Available from: https://stopsuicide.ch/wp-content/uploads/2017/07/smash_rapport_fr.pdf.
- [11] D. Marcelli, P. Ingrand, I. Ingrand, et al., Échelle d'évaluation du risque de récurrence (ecarr). Étude de validation prospective d'une répétition d'accident, *La psychiatrie de l'enfant* **54**, 2011, 253–299.
- [12] H.L. Egger, E.J. Costello, A. Erkanli, et al., Somatic complaints and psychopathology in children and adolescents: stomach aches, musculoskeletal pains, and headaches, *J Am Acad Child Adolesc Psychiatry* **38**, 1999, 852–860.
- [13] C. Currie, C. Zanotti, A. Morgan, et al., Social determinants of health and well-being among young people. Health Behaviour in School-ages Children (HBSC) Study: International report from the 2009/2010 survey, [updated 31.12.2018. Available

from: http://www.euro.who.int/__data/assets/pdf_file/0003/163857/Social-determinants-of-health-and-well-being-among-young-people.pdf.2012, WHO Regional Office for Europe.

- [14] E. Mapelli, T. Black and Q. Doan, Trends in Pediatric Emergency Department Utilization for Mental Health-Related Visit, *J Pediatr* **167**, 2015, 905–910.
- [15] A. Ziv, J.R. Boulet and G.B. Slap, Emergency department utilization by adolescents in the United States, *Pediatrics* **101**, 1998, 987–994.
- [16] T.E. Locker, S. Baston, S.M. Mason, et al., Defining frequent use of an urban emergency department, *Emerg Med J* **24**, 2007, 398–401.
- [17] J.J. Brennan, T.C. Chan, R.Y. Hsia, et al., Emergency department utilization among frequent users with psychiatric visits, *Acad Emerg Med* **21**, 2014, 1015–1022.
- [18] Centre Hospitalier Universitaire Vaudois. Rapport d'activité 2016 [updated 23.09.2018. Available from: <https://rapportsannuels.chuv.ch/activite/2016/>
- [19] Australasian College for Emergency Medicine. Policy on the Australasian Triage Scale 2013 [updated 23.09.2018. Available from: <https://acem.org.au/getmedia/484b39f1-7c99-427b-b46e-005b0cd6ac64/P06-Policy-on-the-ATS-Jul-13-v04.aspx>
- [20] Jamouille M, Roland M, Humbert J, et al. Traitement de l'information médicale par la Classification Internationale des Soins Primaires: CISP-2: deuxième version 2000 [updated 23.09.18. Available from: https://orbi.uliege.be/bitstream/2268/196337/1/cisp_bureau%20fr.pdf.
- [21] A.S. Newton, S. Ali, D.W. Johnson, et al., Who comes back?. Characteristics and predictors of return to emergency department services for pediatric mental health care, *Acad Emerg Med* **17**, 2010, 177–186.
- [22] L. O'Mahony, D.S. O'Mahony, T.D. Simon, et al., Medical complexity and pediatric emergency department and inpatient utilization, *Pediatrics* **131**, 2013, e559–e565.
- [23] A. Christin, C. Akre, A. Berchtold, et al., Parent-adolescent relationship in youths with a chronic condition, *Child Care Health Dev* **42**, 2016, 36–41.
- [24] C. Lidon-Moyano, D. Wiebe, P. Gruenewald, et al., Associations between self-harm and chronic disease among adolescents: Cohort study using statewide emergency department data, *J Adolesc* **72**, 2019, 132–140.
- [25] H. Bohman, U. Jonsson, A. Päären, et al., Prognostic significance of functional somatic symptoms in adolescence: a 15-year community-based follow-up study of adolescents with depression compared with healthy peers, *BMC psychiatry* **12**, 2012, 90
- [26] B. Burstein, H. Agostino and B. Greenfield, Suicidal Attempts and Ideation Among Children and Adolescents in US Emergency Departments, 2007-2015, *JAMA Pediatr* 2019, <https://doi.org/10.1001/jamapediatrics.2019.0464>, [Epub ahead of print].
- [27] Valli, M., Les migrants sans permis de séjour à Lausanne. Rapport rédigé à la demande de la Municipalité de Lausanne. 2003. [updated 07.12.2018. Available from: https://asile.ch/wp/wp-content/uploads/06/RapportValli_SansPapiersLausanne.pdf 2003
- [28] S.D. Depallens, M.J. Puelma, J.D. Krahenbuhl, et al., The health status of children without resident permit consulting the Children's Hospital of Lausanne, *Swiss Med Wkly* **140**, 2010, w81304.
- [29] Office Fédéral de la Statistique, Population résidente permanente et non permanente selon le canton, la nationalité, le pays de naissance, le sexe et l'âge, (2016–2017), 2018, Office Fédéral de la Statistique, [updated 6.11.2018. Available from: <https://www.bfs.admin.ch/bfs/fr/home/statistiques/population.assetdetail.5887451.html>.
- [30] A.B. Goldstein, M.A. Silverman, S. Phillips, et al., Mental health visits in a pediatric emergency department and their relationship to the school calendar, *Pediatr Emerg Care* **21**, 2005, 653–657.

Queries and Answers

Query: The author names have been tagged as given names and surnames (surnames are highlighted in teal color). Please confirm if they have been identified correctly.

Answer: Yes

Query: Correctly acknowledging the primary funders and grant IDs of your research is important to ensure compliance with funder policies. We could not find any acknowledgement of funding sources in your text. Is this correct?

Answer: Yes

Query: Please note that figure 1 was not cited in the text. Please check that the citation suggested by the copyeditor are in the appropriate place, and correct if necessary.

Answer: OK

Query: Please provide journal title for references 1, 10, 20 and 27.

Answer: These references are from websites. I cannot provide you with more information than the url link.