PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Emergency department use for mental and substance use disorders: Descriptive analysis of population-based, linked administrative data in British Columbia, Canada
AUTHORS	Lavergne, M.; Shirmaleki, Mehdi; Loyal, Jackson; Jones, Wayne; Nicholls, Tonia L.; Schütz, Christian; Vaughan, Adam; Samji, Hasina; Puyat, Joseph; Kaoser, Ridhwana; Kaulius, Megan; Small, Will

VERSION 1 – REVIEW

REVIEWER	Marie-Josée Fleury McGill University
REVIEW RETURNED	15-Oct-2021

GENERAL COMMENTS	This article addresses an interesting topic, and is also well written overall. However, the article is very short, reads more as a report than a scientific article. The study is essentially descriptive, and does not include an international perspective enough. The introduction also does not justify the originality of the article enough. I do not understand the sentence related to Ontario and its pertinence (in Quebec, we have also such a system). In my view, the statement that most studies on ED are cross-sectional needs to be revised. Most studies using medico-administrative databases are longitudinal, but mostly based on one or some hospitals. The article is too focused on BC, and should include a more international perspective. There are “multiple statements” related to the “importance of such a research within the context of the overdose crisis”, but how this is associated with the study objectives or results is not developed. In Quebec, our team did validation tests about drug identification with medico-administrative databases, and we believe that only cannabis could be identified with some reliability (SUD, intoxication, substance-induced, withdrawal: alcohol, cannabis, other drugs). Our work and the literature also reported a large under-detection of substance related disorders (SRD) in medico-administrative databases, that should be notified in the limitations section. In the methods, I do not understand the importance of the section “Patient and public involvement” that should be removed, and again a statement of the opioid overdose epidemic. All the development about gender should be removed, and only sex used and discussed. Justification of one record per patient per day needed to be provided, 48 hours would be more a standard in my view. I do not understand this statement: “Patients with two outpatient visits or one hospitalization (within a 365-day period) for the disorders listed in Appendix 2 were considered to have been treated for the disorder [25]”. What is the justification of this, and how this is integrated in the article is not clear to me. Frequent ED visits are also not well defined, justified or discussed in the article.

	The results section needs to be clearer. Data related to the increase of MSUD should be better integrated. I do not understand this sentence: “The percentage of people with substance use disorders and the percentage of people with two or more treated disorders increased with number of ED visits, but the Charlson-Deyo index of comorbidities was similar”. First result sentence should specify that the statistics are for MSUD. The discussion needs a major revision as well. It needs to focus on the study results only and to refer more to the international literature. Furthermore, the conclusion needs to be reconsidered. I recommend to reject this article as it needs too major revisions, but urge the authors to revise their manuscript, with inclusion of multivariate analyses (which should be included in any scientific article in my view), and resubmit.

REVIEWER	Alessandra Costanza University of Geneva, Psychiatry
REVIEW RETURNED	22-Oct-2021

GENERAL COMMENTS	Thank you for the opportunity to review this really interesting paper. Overall: - The paper addresses a highly topical and emerging issue. - This issue has been treated in a very original manner and in a way that is relatively poorly explored at present. As for the main specific sections: - The Introduction incisively introduces the issues that the paper will develop next and it is clearly organized. One observation to enrich the Background and highlight the importance of the aim of this study, authors can add this work which contains a consistent part of literature review: “Who Consult an Adult Psychiatric Emergency Department? Pertinence of Admissions and Opportunities for Telepsychiatry” Medicina (Kaunas). 2020 Jun 13;56(6):295. doi: 10.3390/medicina56060295. - Methods are thoroughly and appear rigorous. - Results are fully exposed. - The Discussion is well written, coherently with the aim of the paper. One observation to enrich the Discussion and highlight the importance of the investigated issue: there is a clear relationship in the literature between substance abuse and hetero- and self-directed violence, conditions that create a vicious cycle and pragmatic problems at the Emergency Departments. I propose to the authors to briefly mention this point (the following reference, which contains a large part of literature review, can be used: “Impulsivity and impulsivity-related endophenotypes in suicidal patients with substance use disorders: an exploratory study”. International Journal of Mental Health and Addiction. DOI: 10.1007/s11469-020-00259-3; this paper is findable in Scopus and Google Scholar as full text). - The Limitation section is present. I propose to the authors to add also the strong points of the article. - The Conclusion is accurate. I suggest the authors give a brief mention here of the practical implications that are so. I propose that the authors emphasize the practical implications of their important work. These implications are very relevant to the clinical reader. - Ethical concerns: The authors stated that they acquired ethics committee approval, so there are not ethical concerns. Best regards.

VERSION 1 – AUTHOR RESPONSE

Reviewer 1 (R1)

Dr. Marie-Josée Fleury, McGill University

R1: This article addresses an interesting topic, and is also well written overall. However, the article is very short, reads more as a report than a scientific article. The study is essentially descriptive, and does not include an international perspective enough. The introduction also does not justify the originality of the article enough. I do not understand the sentence related to Ontario and its pertinence (in Quebec, we have also such a system). In my view, the statement that most studies on ED are cross-sectional needs to be revised. Most studies using medico-administrative databases are longitudinal, but mostly based on one or some hospitals. The article is too focused on BC, and should include a more international perspective.

AR: Thank you. We have substantially edited the introduction to describe published research in more detail and expand the international perspective.

R1: There are "multiple statements" related to the "importance of such a research within the context of the overdose crisis", but how this is associated with the study objectives or results is not developed.

AR: We have amended statements about the overdose crisis. While the impact and extent of the overdose crisis is one way in which British Columbia may differ from other jurisdictions, the revised introduction now more clearly outlines the relevance and originality of this article in addition to that point.

R1: In Quebec, our team did validation tests about drug identification with medico-administrative databases, and we believe that only cannabis could be identified with some reliability (SUD, intoxication, substance-induced, withdrawal: alcohol, cannabis, other drugs). Our work and the literature also reported a large under-detection of substance related disorders (SRD) in medico-administrative databases, that should be notified in the limitations section.

AR: Thank you for this comment and the validation work your team has completed. To address this issue, we have clarified in the methods: "In BC, diagnostic codes for substance use disorders do not include the fifth digit, and thus it is difficult to differentiate between substances, with the exception of alcohol. We created a combined substance use disorders group (including alcohol use)". We have also expanded discussion of this central limitation in the discussion.

R1: In the methods, I do not understand the importance of the section "Patient and public involvement" that should be removed, and again a statement of the opioid overdose epidemic.

AR: The section describing "Patient and public involvement" is required by BMJ Open; therefore, we have left it in the manuscript, but moved it to the end of the methods. We have removed the statement about the opioid overdose epidemic.

R1: All the development about gender should be removed, and only sex used and discussed.

AR: The field we used in analysis does not accurately measure sex or gender. Depending on how the registration form for the provincial insurance plan was completed, this variable may reflect legal sex, sex assigned at birth, or gender. We believe this text is important to fully explain the measure employed in this analysis, and its substantial limitations.

R1: Justification of one record per patient per day needed to be provided, 48 hours would be more a standard in my view.

AR: We appreciate that standard practice may vary across sites/studies. The method we employed for combining datasets and identifying ED visits follows a report produced by UBC's Centre For Health Services Research (https://chspr.sites.olt.ubc.ca/files/2021/02/CHSPR-ED-Report-2021.pdf) which we now cite. While applying a definition of 48 hours instead could reduce erroneous double-counting of ED visits spanning service days, this limitation is consistent over time and does not undermine our ability to describe the population of people with emergency department visits or to examine trends over time.

R1: I do not understand this statement: "Patients with two outpatient visits or one hospitalization (within a 365-day period) for the disorders listed in Appendix 2 were considered to have been treated for the disorder [25]". What is the justification of this, and how this is integrated in the article is not clear to me.

AR: This is reported in table 2, and provides a picture of the full range of disorders treated within the study population, not only the disorder coded at time of ED visits. Regarding our case definition (i.e., two outpatient visits or one hospitalization with a 365-day period), previous research has validated this case definition, and we have included this justification in the section entitled Clinical Characteristics and appropriate references.

R1: Frequent ED visits are also not well defined, justified or discussed in the article.

AR: We appreciate that operational definitions of frequent ED visits vary and we have noted this in the Methods section with supporting citations. We hope that the editorial team agrees that the classification reported in Table 2 (i.e., 1, 2-5, 6-11, 12+ visits) is sufficiently detailed to allow comparison of people with more and less frequent ED visits. We have also

expanded discussion of the individual and services use characteristics associated with frequent ED use in both the results and discussion.

R1: The results section needs to be clearer. Data related to the increase of MSUD should be better integrated. I do not understand this sentence: “The percentage of people with substance use disorders and the percentage of people with two or more treated disorders increased with number of ED visits, but the Charlson-Deyo index of comorbidities was similar”.

AR: We have substantially edited the results section, with the goal of clarifying reporting of results and expanding discussion of increases over time. We have edited the sentence you mentioned to more clearly distinguish between treated mental and substance use disorders and broader comorbidities.

R1: First result sentence should specify that the statistics are for MSUD.

AR: Thank you for this catch. We have made this correction.

R1: The discussion needs a major revision as well. It needs to focus on the study results only and to refer more to the international literature. Furthermore, the conclusion needs to be reconsidered.

AR: We have substantially edited both sections, connecting our results more consistently to the international literature.

R1: I recommend to reject this article as it needs too major revisions, but urge the authors to revise their manuscript, with inclusion of multivariate analyses (which should be included in any scientific article in my view), and resubmit.

AR: We have substantially revised all sections of the manuscript considering the editorial team’s constructive comments. We respectfully disagree about the inclusion of multivariate analysis. As R1 observed, this study is descriptive, and we are able to address our objectives with the analysis as presented. Although multivariable analysis of factors predicting ED use is possible with the data, it is not necessary to achieve our objectives of describing the population and documenting trends in this paper.

Reviewer 2 (R2)

Dr. Alessandra Costanza, University of Geneva

Thank you for the opportunity to review this really interesting paper.

R2: Overall:

- The paper addresses a highly topical and emerging issue.

- This issue has been treated in a very original manner and in a way that is relatively poorly explored at present.

As for the main specific sections:

- The Introduction incisively introduces the issues that the paper will develop next and it is clearly organized. One observation to enrich the Background and highlight the importance of the aim of this study, authors can add this work which contains a consistent part of literature review: “Who Consult an Adult Psychiatric Emergency Department? Pertinence of Admissions and Opportunities for Telepsychiatry” Medicina (Kaunas). 2020 Jun 13;56(6):295. doi: 10.3390/medicina56060295.

AR: Thank you for the kind comments and this suggestion. This work helpfully points to opportunities for community-based management, and we have incorporated it into the discussion section.

R2: Methods are thoroughly and appear rigorous. Results are fully exposed.

AR: Thank you.

R2: The Discussion is well written, coherently with the aim of the paper. One observation to enrich the Discussion and highlight the importance of the investigated issue: there is a clear relationship in the literature between substance abuse and hetero- and self-directed violence, conditions that create a vicious cycle and pragmatic problems at the Emergency Departments. I propose to the authors to briefly mention this point (the following reference, which contains a large part of literature review, can be used: “Impulsivity and impulsivity-related endophenotypes in suicidal patients with substance use disorders: an exploratory study”. International Journal of Mental Health and Addiction. DOI: 10.1007/s11469-020-00259-3; this paper is findable in Scopus and Google Scholar as full text).

AR: Thank you. This point is particularly relevant in that people with substance use disorders may experience ED visits for violence and other reasons related to substance use disorders, but that are not recorded as such in our data. We have added this to the discussion.

R2: The Limitation section is present. I propose to the authors to add also the strong points of the article.

AR: Thank you. We now highlight key strengths as well.

R2: The Conclusion is accurate. I suggest the authors give a brief mention here of the practical implications that are so. I propose that the authors emphasize the practical implications of their important work. These implications are very relevant to the clinical reader.

AR: Thank you. We have modified the conclusion to highlight practical implications more clearly.

R2: Ethical concerns: The authors stated that they acquired ethics committee approval, so there are not ethical concerns.

We hope that our responses, in conjunction with the revised manuscript, effectively addresses the reviewers' comments and feedback, and allow our paper to be considered for publication in BMJ Open. We thank you for this opportunity and look forward to hearing back from you.

VERSION 2 – REVIEW

REVIEWER	Alessandra Costanza University of Geneva, Psychiatry
REVIEW RETURNED	19-Dec-2021

GENERAL COMMENTS	The authors have responded point by point to the reviewers' suggestions and the manuscript has really improved. Congratulations to the authors for their work.