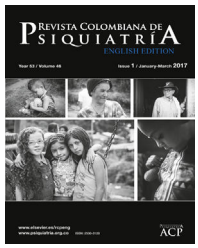
Asociación Colombiana de Psiquiatría ACP

Revista Colombiana de Psiquiatría

www.elsevier.es/rcp



Original Article

Consumption of Alcohol Upon Admission to the Emergency Department in Patients With Trauma

Nelcy Rodriguez-Malagón[a,b,*], *Atilio Moreno-Carrillo*[c], *Miguel L. León-Méndez*[b], *Daniel García Vargas*[b], *María Fernanda Otálora Ribero*[b], *Felipe Botero-Rodríguez*[a,d], *Laura C. Herrera-Daza*[b], *Gustavo A. Flórez-Gonzalez*[b], *Carlos Gómez-Restrepo*[a,c,d]

[a] *Departamento de Epidemiología Clínica y Bioestadística, Pontificia Universidad Javeriana, Bogotá, Colombia*
[b] *Facultad de Medicina, Pontificia Universidad Javeriana, Bogotá, Colombia*
[c] *Hospital Universitario San Ignacio, Bogotá, Colombia*
[d] *Departamento de Psiquiatría y Salud Mental, Pontificia Universidad Javeriana, Bogotá, Colombia*

ARTICLE INFO

Article history:
Received 14 November 2022
Accepted 10 March 2023

Keywords:
Emergency department
Alcohol consumption
Prevalence
Trauma
Injury
Wounds

ABSTRACT

Aim: For 2016, around 32.5% of the population consumed alcoholic beverages. This is related to 1.6% of the disability-adjusted life years. Also, an association is described between trauma severity and a positive alcohol test on admission to the emergency room. In Colombia, the prevalence of alcohol consumption during the last year is 17.8–42.5%. However, the prevalence of alcohol consumption upon admission to emergency services is unknown. We aim to estimate the prevalence of alcohol consumption in cases admitted to an emergency room.

Methods: This was a cross-sectional study. Data were collected during four months in an emergency room located in a fourth-level hospital. Researchers interviewed participants to complete a questionnaire, additionally, a qualitative alcohol test was carried out with an alcohol-sensor FST, and the AUDIT-C scale was used to screen for alcohol abuse.

Results: In 2524 patients, there was a prevalence of alcohol consumption on admission to the emergency room of 2.34%, and a median result of the quantitative test of 1.22 mg/ml. We found that as ethanol levels increased, there was a greater potential for discrimination among the patients who identified themselves with potential risky consumption based on the scale score.

Conclusions: Alcohol consumption is associated with high morbidity in patients admitted to the emergency room. This can increase the burden of disease and affect the quality of life. It is pertinent to recognize alcohol consumption as a possible focus to mitigate the impact of this condition on the well-being of patients and resources allocation.

© 2023 Asociación Colombiana de Psiquiatría. Published by Elsevier España, S.L.U. All rights reserved.

DOI of original article: https://doi.org/10.1016/j.rcp.2023.03.001.
* *Corresponding author.*
E-mail address: nrodrigu@javeriana.edu.co (N. Rodriguez-Malagón).
2530-3120/© 2023 Asociación Colombiana de Psiquiatría. Published by Elsevier España, S.L.U. All rights reserved.

Consumo de alcohol al ingreso del Servicio de Urgencias en pacientes con trauma

Palabras clave:
Servicio de urgencias
Consumo de alcohol
Prevalencia
Traumatismo
Lesión
Heridas

R E S U M E N

Objetivo: En 2016, alrededor del 32,5% de la población consumía bebidas alcohólicas. Esto se relaciona con el 1,6% de los años de vida ajustados por discapacidad. También se describe una asociación entre la gravedad del traumatismo y una prueba de alcohol positiva al ingreso a la sala de urgencias. En Colombia, la prevalencia de consumo de alcohol en el último año es del 17,8-42,5%. Sin embargo, se desconoce la prevalencia de consumo de alcohol al ingreso a los servicios de emergencia. Nuestro objetivo es estimar la prevalencia de consumo de alcohol en los casos ingresados en un servicio de urgencias.

Métodos: El presente estudio tiene un diseño transversal. Los datos fueron recolectados durante 4 meses en un servicio de urgencias ubicado en un hospital de cuarto nivel. Se entrevistó a los participantes para completar un cuestionario, además, se realizó una prueba cualitativa de alcohol con un sensor de alcohol FST y se utilizó la escala AUDIT-C para detectar el abuso de alcohol.

Resultados: En 2.524 pacientes hubo una prevalencia de consumo de alcohol al ingreso a urgencias de 2,34% y una mediana de resultado de la prueba cuantitativa de 1,22 mg/ml. Encontramos que, a medida que aumentaban los niveles de etanol, había un mayor potencial de discriminación entre los pacientes que se identificaban con un consumo potencial de riesgo según la puntuación de la escala.

Conclusiones: El consumo de alcohol se asocia a una alta morbilidad en los pacientes ingresados en urgencias. Esto puede aumentar la carga de la enfermedad y afectar la calidad de vida. Es pertinente reconocer el consumo de alcohol como un posible foco para mitigar su impacto en el bienestar de los pacientes y en la asignación de recursos.

© 2023 Asociación Colombiana de Psiquiatría. Publicado por Elsevier España, S.L.U. Todos los derechos reservados.

Background

In Colombia, the prevalence of alcoholic beverages consumption during the last 12 months is between 17.8 and 42.5%,[1] and has a greater burden of disease in male adults aged 18–44 years old. According to data from the National Mental Health Survey, in the group with a greater disease burden, up to 36% had excessive consumption using the AUDIT-C screening tool. Additionally, around 16% (95% CI [14.4–17.8]) of this group had risky consumption and possible alcohol dependence according to the AUDIT-A tool.[1] In 2016, a multinational collaboration of 195 countries reported that around 32.5% (95% CI [30–35.2]) of the population were alcohol consumers. This represented 1.6% (95% CI [1.4–2]) of the total global disability-adjusted years (DALYs) among women and 6% (95% CI [5.4–6.7]) among men, and the seventh risk factor of premature death and disability.[2]

Otherwise, in 2019, a cross-sectional study in Uruguay,[3] described a positive relationship between the severity of the trauma – ISS (Index Severity Score) and the presence of a positive breathalyzer test upon admission to the emergency room. This suggests the importance of knowing the burden of the disease in local emergency services to adjust protocols and health care services. Nonetheless, studies in this area are limited in Colombia.

In 2011, in an emergency room in Bogotá, the prevalence of alcohol consumption upon admission to the emergency room was 1.7%,[4] and the most common diagnosis was trauma. For the next year (2012), the prevalence of alcohol consumption was 4.83% for traffic accident victims, and pedestrians were more frequently injured and transferred to a different hospital (44%).[5] However, to the best of our knowledge, Colombian prevalence of this condition outside traffic accidents is unknown.

We aim to determine the prevalence of alcohol consumption in patients admitted to an emergency room located in a fourth-level hospital, considering trauma not related to traffic accidents, its severity, and alcohol abuse screening using the AUDIT-C instrument, between August 8 and November 30, 2019.

Methods

We carried out a cross-sectional study. We implemented a prospective systematic collection model during 24 h of care in the Triage service of an emergency room located in a fourth-level hospital (San Ignacio University Hospital) between August 8 and November 30, 2019. We implemented a survey that was reviewed and validated by the research group. Once study phase finished, data was digitized in REDCap,[6] considering a conditional registration schedule for data validation to mitigate errors derived from the transcription. By the end of this process, clinical variables were confirmed, and a peer review of the hospital's electronic records was made, considering selection criteria to verify whether the

patient completed the medical care or desisted from it. We interviewed patients who consulted or were admitted to the emergency room for any reason and had received medical attention, and those older than 14 years classified as Triage 2–5.

Exclusion criteria

Patients with a requirement for ventilatory support, pregnant, hemodynamically unstable, with trauma due to traffic accidents (considering it like an event that generally occurs when a vehicle collides against one or more sectors of the road or another stationary obstruction), inability to communicate, who did not consent to participate, who had no clinical record in the hospital, with inconsistencies with the type of trauma recorded in the information system and/or failures or absence in the completion of the forms. Patients classified with the triage and who did not receive care at the hospital were included in the losses (see Fig. 1). Follow-up losses represented 17.2% of the total surveyed patients, without difference between positive and negative breathalyzer patients.

Patients who met the inclusion criteria answered the questionnaire designed by the researchers with a directed interview related with sociodemographic data. We asked patients to perform a qualitative breathalyzer test with an FST alcohol sensor by the end of this interview. This sensor was calibrated healthcare personnel trained. In case of a positive result, the quantitative test was carried out by changing the mouthpiece in the same alcohol sensor until obtained the value (mg/ml). This process ended with the self-completion of the AUDIT-C scale for the screening of alcohol abuse.

Results

3046 participants were eligible, 17.17% ($n = 523$) were excluded due to reasons described in the methodology, the final sample for analysis was 2524 patients. The prevalence of alcohol consumption upon admission to the emergency room was 2.34% ($n = 59$), most of these patients were treated during the weekend and during the night shift. The median result of the quantitative test was 1.22 mg/ml IQR [2.91 mg/ml]. Among patients with a positive alcoholimetry, trauma not related to traffic accidents was 54%. Within the traumas reported in patients with positive alcoholimetry, the most frequent degree of severity was the mild one, as measured by the ISS (score of 9 or less points).[7] Due to the type of study, it was not possible to clarify if this was due to alcohol consumption (Table 1).

Most of the population was male, aged 18–30 years old, with an employment contract. Approximately 60% of the study population belonged to a socioeconomic stratum lower than or equal to 3. Regarding the clinical variables, more than 80% of the participants were conscious at the time of the interview. Additionally, there was a higher frequency of conjunctival injection and scanning dysarthria in patients with alcohol consumption, without these symptoms being specific to alcohol consumption (Table 1).

Among patients with a positive qualitative test, the distribution was 4 (7%), 15 (25%), 16 (27%) and 24 (41%) for grades 0 (0.2–0.39 mg/ml), 1 (0.4–0.99 mg/ml), 2 (1–1.49 mg/ml), and 3 (>1.49 mg/ml) respectively. Considering these alcohol levels, more than 50% of the patients were male between 18 and 30 years. All these categories, except for grade 0 were more prevalent for participants between 31 and 44 years old. The most prevalent marital status was single and most of them were exercising their working lives as employees under a current employment contract. Regarding the clinical variables recorded by the interviewer at the time of the application of the survey, more than 80% of the patients with positive breathalyzer were conscious regardless of the level of breathalyzer, however, as the level of ethanol increased there was a tendency to present conjunctival injection and difficulties in the speech.

Table 1 – General characteristics of population.

	Positive alcoholimetry *n* (%)	Negative alcoholimetry *n* (%)
N	59	2465
Age		
Mean (±*SD*)	33.6 (16.7)	37.5 (15.6)
Range	15–87	16–96
Gender		
Female	14 (24)	1288 (52.3)
Male	45 (76)	1177 (47.8)
Education level		
Preschool	–	10 (0.4)
Primary education	7 (11.9)	320 (12.9)
Highschool	25 (42.4)	951 (38.6)
Pregraduate	17 (28.8)	541 (21.9)
Postgraduate	2 (3.4)	72 (2.9)
Technician/technologist	6 (10.2)	556 (22.6)
None	–	14 (0.6)
Unknown	2 (3.4)	1 (0.04)
Regime of membership in health		
Contributory	50 (84.8)	2246 (91.1)
Subsidized	5 (8.5)	66 (2.7)
Prepaid	2 (3.4)	8 (0.3)
Labor risk insurer	–	97 (3.9)
None	1 (1.7)	–
Unknown	–	1 (0.04)
Particular	1 (1.7)	38 (1.5)
Other	–	9 (0.3)
Occupation		
Dependent employee	31 (52.5)	1644 (66.7)
Independent employee	11 (18.6)	247 (10.02)
Student	10 (16.9)	227 (9.2)
Unemployee	–	63 (2.6)
Home trades	–	167 (6.8)
Pensionary	3 (5.1)	100 (4.1)
Other	1 (1.7)	2 (0.1)
Informal job	–	9 (0.4)
Unknown	2 (3.4)	1 (0.04)
Presented trauma		
Yes	32 (54.2)	454 (18.4)
No	27 (45.8)	2011 (81.6)
Trauma severity		
Mild	26 (81.3)	432 (95.2)
Moderate	4 (12.5)	15 (3.3)
Severe	1 (3.1)	7 (1.5)
Deep	1 (3.1)	–

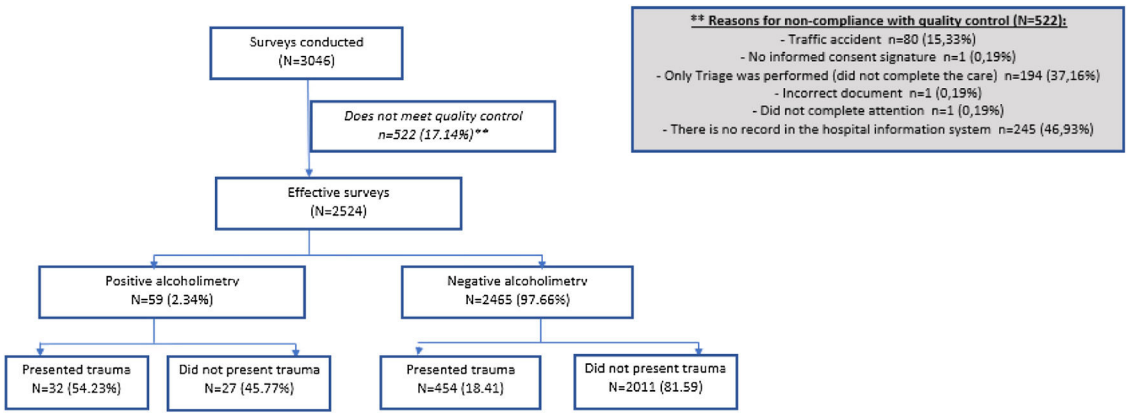


Fig. 1 – Enrollement flowchart.

With the AUDIT-C screening test, as ethanol levels increased, there was a greater potential for discrimination among patients than, by the scale score, were identified with potential consumption risk of those who did not. Regarding trauma not derived from traffic accidents, its occurrence was independent of the alcohol level (Table 2).

Furthermore, 93% of the patients with positive alcohol testing reported consuming alcohol 6 h before admission. A logistic regression model was carried out to explore the association between alcohol consumption and the previously mentioned explanatory variables, observing that there is a positive association with the male gender (OR: 2.61) to refer to alcohol consumption 6 h before admission in the same way, it seems that there is a negative association concerning the increase in the patient's age (OR: 0.98), or if they refer to living in a lower socioeconomic stratum (OR: 0.63), or being active in work (OR: 0.61).

Half of the group with a positive alcohol test presented a traumatic diagnosis ($n = 30$) while the other 50% had a behavioral and/or psychiatric, gastrointestinal and/or non-traumatic musculoskeletal conditions (Table 3).

A description of the diagnoses was made in patients with positive alcoholimetry, considering their biological nature at the discretion of the emergency physicians. Approximately 45% of admission diagnoses had in their description injury or wound, which for this study was called traumatic in allusion to possible diagnoses related to trauma not derived from road accidents, according to the ICD classification-10 of the World Health Organization (WHO). In this way, it was observed that half of the population with positive alcohol testing presented a traumatic diagnosis ($n = 30$). At the same time, the other 50% was represented by non-traumatic behavioral or psychiatric, gastrointestinal, or musculoskeletal conditions (see Table 3).

Discussion

The data obtained in the present study show a sizable frequency of alcohol consumption before admission to the emergency service, since this research was made in a not a referral center for trauma. This finding was present in approximately half of the participants with a positive alcohol test, like that observed by toxicological studies in which the prevalence of positive alcohol levels or blood alcohol levels above 80 g/dL in patients who attend trauma centers varies from 27 to 63%.[8] Also, raises questions such as: what the level of association between alcohol consumption and trauma severity is.

This concern has been addressed by other research papers. One of them observed that the self-reported consumption pattern at the individual level is a predictor variable of the cause of alcohol-related injuries.[9] Likewise, in the literature, it has been described that alcohol consumers have a greater risk of traumatic injury in terms of the probability of occurrence of such injury and its severity. One of the possible reasons is having a traumatic injury, greater risk of being involved in a traumatic event than people with negative alcohol testing because of the behavioral inhibition, even going so far as to propose trauma as an indicator of alcohol abuse and dependence.[8,10,11]

Despite the limitations regarding the sample size, our results show that as the alcoholimetry result levels increased, the application of the AUDIT-C screening scale tended to improve its discriminatory potential. For this reason, an analysis of concordance between the result of the positive alcohol test greater than 0.2 mg/dl and the identification of risky consumption was proposed, taking as a premise that levels greater than 1 mg/dl will imply a clinical repercussion for the patient and emergency services. Therefore, so much so that their identification at the emergency room increases the risk of risky consumption. Being able to estimate a mild kappa concordance coefficient level for breath alcohol levels above 1.49 mg/dl ($k = 0.228$, $p = 0.0499$) that is a mild concordance, nevertheless, there has been described a mild correlation with biomarkers, like phosphatidyl ethanol.[12]

On the other hand, concerning the distribution of the economic resource in health, the question arises of the budgetary impact, or the level of utility cost of this condition represents the insurer, whether private or public. Which[13] reported a cost of care related to alcohol consumption that ranges from £ 173 to £ 316 from the payer's perspective and an annual fee of $7.6 billion with all alcohol-related disorders in the US[14]; reaching a substantial increase if the care ended in hospitalization. This gives rise to future studies evaluating the impact on health and the health system from different branches of clinical epidemiology to explore possible routes of preven-

Table 2 – Distribution of the sociodemographic and clinical variables according to alcoholemia levels.

	Grade 0	Grade 1	Grade 2	Grade 3	Total
n (%)	4 (100)	15 (100)	16 (100)	24 (100)	59 (100)
Age ranges					
14–17 years old	–	1 (7)	1 (6)	–	2 (3)
18–30 years old	1 (25)	7 (47)	13 (81)	14 (58)	35 (59)
31–44 years old	2 (50)	5 (33)	1 (6)	2 (8)	10 (17)
45–65 years old	1 (25)	1 (7)	1 (6)	4 (17)	7 (12)
>66 years old	–	1 (7)	–	4 (17)	5 (8)
Marital status					
Married	–	2 (13)	1 (6)	–	3 (5)
Unknown	–	–	–	2 (8)	2 (3)
Divorced	–	1 (7)	1 (6)	3 (13)	5 (8)
Single	3 (75)	9 (60)	10 (63)	16 (67)	38 (64)
Free union	1 (25)	3 (20)	4 (25)	3 (13)	11 (19)
Gender					
Female	–	4 (27)	6 (38)	4 (17)	14 (24)
Male	4 (100)	11 (73)	10 (62)	20 (83)	45 (76)
Occupation					
Unknown	–	–	–	2 (8)	2 (3)
Dependent employee	2 (50)	9 (60)	9 (56)	11 (46)	31 (53)
Independent employee	1 (25)	2 (13)	4 (25)	4 (17)	11 (19)
Student	1 (25)	2 (13)	3 (19)	4 (17)	10 (17)
Disabled	–	1 (7)	–	–	1 (2)
Other	–	–	–	1 (4)	1 (2)
Pensionary	–	1 (7)	–	2 (8)	3 (5)
Weekday					
Monday	–	1 (7)	1 (6)	3 (13)	5 (8)
Tuesday	–	–	1 (6)	2 (8)	3 (5)
Wednesday	1 (25)	2 (13)	–	1 (4)	4 (7)
Thursday	–	1 (7)	–	3 (13)	4 (7)
Friday	1 (25)	2 (13)	3 (19)	3 (13)	9 (15)
Saturday	1 (25)	5 (33)	7 (44)	9 (38)	22 (37)
Sunday	1 (25)	4 (27)	4 (25)	3 (13)	12 (29)
Awakeness					
Aware	4 (100)	15 (100)	15 (94)	22 (92)	56 (95)
Somnolent	–	–	–	1 (4)	1 (2)
Clouded	–	–	1 (6)	1 (4)	2 (3)
Conjunctive injection					
No	3 (75)	6 (40)	3 (19)	5 (21)	17 (29)
Yes	1 (25)	9 (60)	13 (81)	19 (79)	42 (71)
Scandal dysarthria					
No	4 (100)	12 (80)	11 (69)	10 (42)	37 (63)
Yes	–	3 (20)	5 (31)	14 (58)	22 (37)
Audit-c					
Abuse	4 (100)	7 (47)	8 (50)	19 (79)	38 (64)
Not abuse	–	8 (53)	8 (50)	5 (21)	21 (36)
Trauma severity					
Not trauma	1 (25)	10 (67)	7 (44)	9 (38)	27 (46)
Mild	2 (50)	4 (27)	9 (56)	11 (46)	26 (44)
Moderate	–	1 (7)	–	3 (13)	4 (7)
Severe	1 (25)	–	–	–	1 (2)
Deep	–	–	–	1 (4)	1 (2)

tion and risk management from a primary path of care such as the emergency service. Notwithstanding, this approach should be tailored to each cultural context, aiming to identify the characteristics and motivations of alcohol consumers to improve the human care settings and to identify individuals who incur or may be at risk of developing alcohol-related problems.[15,16]

Ethel Alderet et al.,[17] observed a greater risk of being high-risk consumers (ORa 2.4; 95% CI 1.5–3.9) for patients admitted due to accidents, situations of violence, or drug use, com-

Table 3 – Distribution of admission diagnostics according to alcoholimetry results.

ICD-10 code	Description	Negative	Positive	Total
A090	Infectious gastroenteritis and colitis, unspecified	102	2	104
F160	Hallucinogen related disorders	1	1	2
G439	Migraine, unspecified	35	1	36
G560	Carpal tunnel syndrome	4	1	5
H920	Otalgia and effusion of ear	6	1	7
J00X	Acute nasopharyngitis	73	1	74
K297	Gastritis, unspecified	13	1	14
K529	Noninfective gastroenteritis and colitis, unspecified	16	1	17
K922	Gastrointestinal hemorrhage, unspecified	4	1	5
M255	Pain in joint	5	1	6
M798	Periprosthetic fracture around other internal prosthetic joint	0	1	1
N202	Calculus of kidney with calculus of ureter	1	1	2
R064	Hyperventilation	0	1	1
R071	Chest pain on breathing	2	1	3
R073	Other chest pain	8	1	9
R074	Chest pain, not specificated	80	1	81
R33X	Retention of urine	9	1	10
R454	Irritability and anger	0	1	1
R51X	Headache	140	3	143
S011	Open wound of eyelid and periocular area	1	1	2
S017	Head injuries	0	1	1
S018	Open wound of other parts of head	4	1	5
S019	Open wound of unspecified part of head	8	5	13
S058	Other injuries of eye and orbit	4	1	5
S068	Other specified intracranial injuries	0	1	1
S097	Head traumatisms	0	1	1
S098	Other specified injuries of head	11	2	13
S099	Unspecified injury of face and head	10	4	14
S202	Contusion of thorax	7	1	8
S380	Crushing injury and traumatic amputation of abdomen, lower back, pelvis and external genitals	0	1	1
S411	Open wound of upper arm	2	1	3
S430	Subluxation and dislocation of shoulder joint	1	2	3
S510	Open wound of elbow	0	1	1
S600	Contusion of finger without damage to nail	22	2	24
S602	Contusion of wrist and hand	20	1	21
S623	Fracture of other and unspecified metacarpal bone	3	1	4
S711	Open wound of thigh	1	1	2
S800	Contusion of knee	29	1	30
S801	Contusion of lower leg	4	1	5
T519	Toxic effect of unspecified alcohol	0	2	2
Y911	Moderate alcoholic intoxication	0	2	2
Y919	Alcoholism, intoxication level not specified	1	2	3
Z988	Other specified postprocedural states	20	1	21

pared to income from other causes. As well as for harmful consumption (ORa 2.6; 95% CI 1.5–4.4) and presence of dependence symptoms (ORa 2; 95% CI 1.2–3.3). Nevertheless, given the nature of the self-report of this condition, it gives rise to the problem of its validity, for which Cherpitel et al.,[18] using a multivariate analysis, explored the association between the validity of the AUDIT-C, the characteristics of the trauma, and the blood alcohol concentration. They found that a high blood alcohol concentration was associated with a high probability of reporting alcohol intake, with heavy consumption and injuries in traffic accidents or events related to violence, thus supporting the validity of the substrate of this measurement instrument.

This study presents some strengths. Firstly, to our knowledge, this is the first manuscript to evaluate this association and frequency in our country, pointing out a problem in public health that should be approached with a differential approach in our context. Also, this research was done in a not a referral center for trauma, so our results could be more generalizable. Notwithstanding, it also has some limitations. Because

of the cross-section design, we cannot estimate the direct risk between alcohol consumption and the mental health symptoms reported. Nevertheless, that is outside the objectives of this work, and other studies have addressed it.[19] Additionally, it was developed in only one city in Colombia, so, despite its development in the capital, it could ignore some important results from rural areas; future research should address this population. Also, we include a short period of time, it could dismiss some possible changes in the alcohol consumption, for example, the described in holidays.[20] Finally, excluding patients that require ventilatory support or are hemodynamically unstable could limit our generalizability. Nevertheless, the exclusion rate was low, and we consider that it no influence our results.

Conclusion

Alcohol consumption represents a social, work, and family problem and high morbidity of patients admitted to the emergency departments, evidenced by the more frequent traumatic pathology in positive patients for substance abuse, which can increase the burden of disease and affect patients' productivity and quality of life. Therefore, given that the emergency department is the recipient of acute conditions for any cause in this study, it is vitally important to recognize alcohol consumption as a possible focus of intervention to mitigate the impact of this condition on the patient's well-being and health – allocation of resources in each institution.

Funding

Conflicts of interest

The authors declare no conflicts of interest.

Acknowledgements

We want to thank the patients and emergency personnel of the HUSI who supported the information collection process, especially at the beginning of the pandemic.

REFERENCES

1. Gómez-Restrepo C, Escudero de Santacruz C, Matallana Eslava D, González Ballesteros L, Rodríguez Romero V, Rodríguez Malagón MN, et al. Encuesta Nacional de Salud Mental 2015. Tomo I [Internet]. 2015. Available from: http://www.odc.gov.co/Portals/1/publicaciones/pdf/consumo/estudios/nacionales/CO031102015-salud_mental_tomoI.pdf.
2. Griswold MG, Fullman N, Hawley C, Arian N, Zimsen SRM, Tymeson HD, et al. Alcohol use and burden for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. The Lancet. 2018;392:1015–35.
3. Delgado E, Trostchansky J, Mion M, Ketzoian C, Barindelli A, Machado F. Consumo de alcohol, relación con el trauma y su severidad. Revista Medica Del Uruguay. 2019;35:129–38.
4. Gómez-Restrepo C, Castro-Díaz S, Díaz CE, Castillo D, Gil F, Alberto C, et al. Prevalencia del consumo de sustancias psicoactivas en pacientes no psiquiátricos que consultan un servicio de urgencias en Bogotá. Rev Colomb Psiquiat. 2011;40:709–22.
5. Uribe Granja C, Saavedra MA, Almarales JR, Bermúdez CE, Mora Rodríguez JL, Cediel Mahecha CA. Prevalencia de consumo de alcohol y sustancias psicoactivas en víctimas de accidentes de tránsito. Repert Med Cir. 2013;22:273–9.
6. Blumenberg C, Barros AJD. Electronic data collection in epidemiological research: the use of REDCap in the Pelotas birth cohorts. Appl Clin Inform. 2016;7:672–81.
7. Bolorunduro OB, Villegas C, Oyetunji TA, Haut ER, Stevens KA, Chang DC, et al. Validating the injury severity score (ISS) in different populations: ISS predicts mortality better among Hispanics and females. J Surg Res. 2011;166:40–4.
8. Cassiani CA, Cubides ÁM, Varona MTB, Trespalacios WM. Alcohol y trauma: un problema prioritario de salud pública. Salud Uninorte. 2012;28:131–49.
9. Cherpitel CJ, Witbrodt J, Ye Y, Korcha R. A multi-level analysis of emergency department data on drinking patterns, alcohol policy and cause of injury in 28 countries. Drug Alcohol Depend. 2018;192:172–8.
10. Watt K, Purdie DM, Roche AM, McClure R. Injury severity: role of alcohol, substance use and risk-taking. Emerg Med Australas. 2006;18:108–17.
11. Watt K, Purdie DM, Roche AM, McClure RJ. Risk of injury from acute alcohol consumption and the influence of confounders. Addiction. 2004;99:1262–73.
12. Littlefield AK, Brown JL, DiClemente RJ, Safonova P, Sales JM, Rose ES, et al. Phosphatidylethanol (PEth) as a biomarker of alcohol consumption in HIV-infected young Russian women: comparison to self-report assessments of alcohol use. AIDS Behav. 2017;21:1938.
13. Parkinson K, Newbury-Birch D, Phillipson A, Hindmarch P, Kaner E, Stamp E, et al. Prevalence of alcohol related attendance at an inner city emergency department and its impact: a dual prospective and retrospective cohort study. Emerg Med J. 2016;33:187–93.
14. Peterson C, Li M, Xu L, Mikosz CA, Luo F. Assessment of annual cost of substance use disorder in US hospitals. JAMA Netw Open. 2021;4, e210242.
15. Vargas S, Medina Chávez AM, Gómez-Restrepo C, Cárdenas P, Torrey WC, Williams MJ, et al. Addressing harmful alcohol use in primary care in Colombia: understanding the sociocultural context. Rev Colomb Psiquiatr (Engl Ed). 2021;50:73–82.
16. Santora L, Byrne D, Klöckner C. Clusters of older adults with and without experience of alcohol-related harms based on affective motivations for drinking. Nordisk Alcohol Nark. 2022;39:379–405.
17. Alderete E, Bianchini P. Consumo de alcohol en la consulta de una sala de emergencia. Medicina (B Aires). 2008;68:31–6.
18. Cherpitel CJ, Ye Y, Bond J, Borges G, Macdonald S, Stockwell T, et al. Validity of self-reported drinking before injury compared with a physiological measure: cross-national analysis of emergency-department data from 16 countries. J Stud Alcohol Drugs. 2007;68:296–302.
19. Castillo-Carniglia A, Keyes KM, Hasin DS, Cerdá M. Psychiatric comorbidities in alcohol use disorder. Lancet Psychiatry. 2019;6:1068–80.
20. Heacock RM, Capodilupo ER, Czeisler ME, Weaver MD, Czeisler CA, Howard ME, et al. Sleep and alcohol use patterns during federal holidays and daylight saving time transitions in the United States. Front Physiol. 2022;13:884154.