

COVID-19 and Substance Use: A Scientometric Assessment of Global Publications During 2020 and 2021

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Abstract

Aim: This study aimed to assess the characteristics and trends of research on substance use and COVID-19.

Methods: Keywords related to “Covid-19” and “Substance Use” were used in a search query formulated for the Scopus search engine. The articles published during the years 2020 and 2021, through early November 2021, were considered.

Results: A total of 2184 publications were published on this topic, averaging 9.69 citations per paper. About one-seventh (13.96%) share of global publications was supported by extramural funding support. The maximum number of publications emerged from the United States of America (USA) ($n = 831$; 38.05%), followed by the United Kingdom (UK) ($n = 212$; 9.71%), India ($n = 165$; 7.55%), and Canada (155 papers; 7.10%). In terms of citation impact, publications emerging from China (24.42 and 2.52) had the highest citation impact, followed by publications emerging from Australia (18.83 and 1.94), France (16.48 and 1.70), the UK (15.44 and 1.59), Italy (13.36 and 1.38), and Canada (12.73 and 1.31). When the data in terms of specific institutes were evaluated, Harvard Medical School, USA ($n = 52$), was ranked first in productivity, followed by the University of Toronto, Canada ($n = 47$); the Yale School of Medicine, USA ($n = 35$); INSERM, France ($n = 29$); and the University of British Columbia, Canada ($n = 25$). The University College London, UK (30.24 and 3.12), ranked first in citation impact, followed by INSERM, France (22.0 and 2.27); the Sapienza University of Rome, Italy (17.4 and 1.8); and the University of Toronto, Canada (13.68 and 1.41). When the journals were evaluated, the *International Journal of Environmental Research and Public Health* ($n = 83$) ranked first in publication productivity, followed by the *Journal of Substance Abuse Treatment* ($n = 73$), *Frontiers in Psychology* ($n = 39$), *Drug and Alcohol Dependence* ($n = 28$), and *International Journal of Drug Policy* ($n = 26$).

Conclusion: This bibliometric study suggests that a large amount of literature has accumulated during the COVID-19 pandemic on substance use disorders, both from developed and developing countries.

Keywords

COVID-19, Substance use, Global publications, Scientometrics, Bibliometric

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Introduction

The COVID-19 pandemic emerged as a major crisis for humans across the globe. The pandemic led to lockdown for months together in many countries. In some countries, the lockdown was announced suddenly, and people had no time to prepare themselves for their needs. In many countries, the lockdown was also associated with the disruption of various medical services.

The lockdown and disruption of medical services emerged as a major blow for people using different kinds of substances in the dependent pattern. Many of the patients who were using licit substances experienced withdrawal states and landed in emergency, and those who were receiving substitution therapies of illicit substances also experienced difficulty in reaching the medical services.

A survey by the World Health Organization (WHO), which included data that was collected during the period of March to June 2020 from 105 countries, showed that across the globe, 90% of countries saw the disruption of their health care services with the disruption of services for mental health disorders to the extent of 61%¹. Another round of the pulse survey done a year later still shows that there is a

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disruption in one or more essential health services in about 90% of the countries, with services in the form of mental, neurological, and substance use disorders being still affected in more than 40% of the countries.² Another survey by WHO, which specifically focused on the impact on the mental health services in 130 countries and was conducted during June to August 2020, showed that in 45% of the countries, there was disruption of opioid agonist maintenance treatment; in 35% of the countries, there was a disruption in emergency interventions for severe substance withdrawal states; and in 30% of the countries, there was a disruption in access to medication for the management of mental, neurological, and substance use disorders.³

Considering the huge impact of the COVID-19 pandemic on mental health services, especially substance use services, a large number of publications have emerged on the impact of the COVID-19 pandemic. In this connection a few reviews have focused on the impact of the COVID-19 pandemic on the persons with substance use disorders.⁴

Considering the huge impact of the pandemic on the persons with substance use disorders, a large number of publications have emerged on the topic. However, none of the studies have assessed the publication output by using bibliometric methods. Accordingly, this study aimed to assess the characteristics and trends of research on substance use and COVID-19. An additional aim of the study was to identify the broad areas, important keywords, countries of origin of research, different organizations and authors active in research in this area, the journals that published research on this topic, and the highly cited papers on this topic.

Methodology

The authors performed a bibliometric search on the theme “COVID-19 and Substance Use” using a comprehensive search strategy, which identified, retrieved, and downloaded all relevant publication records from the Scopus database (<https://www.scopus.com>) on this theme. The search strategy using two sets of keywords related to “COVID-19” and “Substance Use” in field tags, “Keyword” or “Title” (article title), was used. The search was limited to the years 2020–2021, through November 17, 2021. The search yielded 2184 records, which were further analyzed using additional analytical provisions in the Scopus database.

TITLE (“COVID-19” OR “2019 novel coronavirus” OR “coronavirus 2019” OR “coronavirus disease 2019” OR “2019-novel CoV” OR “2019 ncov” OR “covid-2019” OR “covid19” OR “corona virus 2019” OR “ncov-2019” OR “ncov2019” OR “nCoV 2019” OR “2019-ncov” OR “covid-19” OR “Severe acute respiratory syndrome coronavirus 2” OR “SARS-CoV-2”) OR KEY (“COVID-19” OR “2019 novel coronavirus” OR “coronavirus 2019” OR “coronavirus disease 2019” OR “2019-novel CoV” OR “2019 ncov” OR

“covid 2019” OR “covid19” OR “corona virus 2019” OR “ncov-2019” OR “ncov2019” OR “nCoV 2019” OR “2019-ncov” OR “covid-19” OR “Severe acute respiratory syndrome coronavirus 2” OR “SARS-CoV-2”) and Key (“Substance use” or “alcohol” or “opioids” or “cannabis” or “tobacco” or “benzodiazepine” or “caffeine” or “stimulants” or “cocaine” or “Inhalants” or “club drug”).

Results

Overall Output

Global scholars have published 2184 publications (2020 = 1081; 2021 = 1103) on the topic of “COVID-19 and Substance Use” as listed in the Scopus database. These 2184 publications have received 21,170 citations, averaging 9.69 citations per publication (CPP). Of the 2184 global publications on this theme, 176 (8.05%) publications were supported by external funding support from 100+ global research agencies, and they together accounted for 1205 citations, averaging 6.85 CPP. Of the 2184 global publications, articles constituted the largest global share (60.44%), followed by letters and reviews (13.92% and 10.62%, respectively), notes and editorials (7.01% and 6.5%, respectively), short surveys and conference papers (0.96% and 0.46%, respectively), and erratum (0.09%).

Top 10 Most Productive Countries

Researchers from 114 countries contributed to these publications, with authors from 72 countries contributing 1 to 10 papers each, researchers from 15 countries publishing 11 to 20 papers each, researchers from 15 countries publishing 21 to 50 papers each, and researchers from 6 countries publishing 51 to 100 papers each. Researchers from only 4 countries published 112 to 165 papers each, and researchers from only 2 countries published more than 200 papers. The researchers from the top 10 countries contributed 75 to 831 papers each and together contributed 1973 papers, which were cited 22,685 times, constituting 90.34% and more than 100% share in global publications and citations respectively. The largest number of publications emerged from the United States of America (USA; 831 papers, 38.05% share), followed by the United Kingdom (UK; 212 papers, 9.71% share), India (165 papers, 7.55% share), Canada (155 papers, 7.10% share), and Italy (153 papers, 7.01% share). Overall, the research output from 6 out of the top 10 countries registered CPP and relative citation index (RCI) higher than their group average (11.5 and 1.19), and these countries were China (24.42 and 2.52), Australia (18.83 and 1.94), France (16.48 and 1.70), UK (15.44 and 1.59), Italy (13.36 and 1.38), and Canada (12.73 and 1.31). The share of international collaborative papers from the top 10 countries varied from 23.59% to 53.57%, with an average of 36.9% (Table 1).

Table 1. Profile of the Top 10 Countries in Global Output in “COVID-19 and Substance Use.”

S. No.	Country	TP	TC	CPP	<i>h</i> -Index	ICP	%ICP	RCI	%TP
1	United States	831	6960	8.38	39	211	25.39	0.86	38.05
2	UK	212	3273	15.44	28	110	51.89	1.59	9.71
3	India	165	1251	7.58	16	52	31.52	0.78	7.55
4	Canada	155	1973	12.73	19	83	53.55	1.31	7.10
5	Italy	153	2044	13.36	24	62	40.52	1.38	7.01
6	Australia	112	2109	18.83	19	60	53.57	1.94	5.13
7	Spain	100	1129	11.29	19	43	43.00	1.17	4.58
8	China	93	2271	24.42	16	43	46.24	2.52	4.26
9	France	77	1269	16.48	15	35	45.45	1.70	3.53
10	Brazil	75	406	5.41	7	29	38.67	0.56	3.43
–	Total	1973	22,685	11.50	202	728	36.90	1.19	90.34
–	Global total	2184	21,170	9.69	404	1456	66.67	–	100.00
–	Share of the top 10 countries in global output	90.34	–	–	–	–	–	–	–

Abbreviations: TP, total papers; TC, total citations; CPP, citations per paper; ICP, international collaborative paper; RCI, relative citation index.

Table 2. Size of Collaborative Linkages Among the Top 10 Countries.

S. No.	Name of the Country	Collaborative Linkages With Other Top 10 Countries	Total Collaborative Linkages (Number of Countries)
1	United States	2 (31), 3 (22), 4 (55), 5 (24), 6 (24), 7 (17), 8 (23), 9 (10), 10 (15)	221 (9)
2	UK	1 (31), 3 (11), 4 (17), 5 (21), 6 (24), 7 (15), 8 (7), 9 (10), 10 (5)	143 (9)
3	India	1 (22), 2 (11), 4 (4), 5 (12), 6 (4), 7 (1), 8 (3), 9 (6), 10 (7)	70 (9)
4	Canada	1 (55), 2 (17), 3 (4), 5 (9), 6 (11), 7 (10), 8 (4), 9 (4), 10 (4)	118 (9)
5	Italy	1 (24), 2 (21), 3 (12), 4 (9), 6 (7), 7 (15), 8 (2), 9 (11), 10 (8)	109 (9)
6	Australia	1 (24), 2 (24), 3 (4), 4 (11), 5 (7), 7 (5), 8 (5), 9 (5), 10 (3)	88 (9)
7	Spain	1 (17), 2 (15), 3 (1), 4 (10), 5 (15), 6 (5), 8 (4), 9 (12), 10 (5)	84 (9)
8	China	5 (2), 6 (5), 7 (4), 9 (1), 10 (1)	14 (5)
9	France	1 (10), 2 (10), 3 (6), 4 (4), 5 (11), 6 (5), 7 (12), 8 (1), 10 (3)	62 (9)
10	Brazil	1 (15), 2 (5), 3 (7), 4 (4), 5 (8), 6 (3), 7 (5), 8 (1), 9 (3)	51 (9)

Table 3. Subject-Wise Distribution of Papers on “COVID-19 and Substance Use.”

S. No.	Name of the Subject	TP	TC	CPP	%TP
1	Medicine	1878	18,776	10.00	85.99
2	Psychology	219	1607	7.34	10.03
3	Pharmacology, toxicology, and pharmaceutics	192	1095	5.70	8.79
4	Neuroscience	130	1611	12.39	5.95
5	Biochemistry, genetics, and molecular biology	128	1020	7.97	5.86
6	Environment science	128	1411	11.02	5.86
7	Social sciences	121	1005	8.31	5.54
8	Immunology and microbiology	79	866	10.96	3.62
9	Global total	2184	21,170	9.69	–

Abbreviations: TP, total papers; TC, total citations; CPP, citations per paper.

Collaborative Linkages Among the Top 10 Countries

The total collaborative linkages among the top 10 countries varied each from 14 to 221, and individual country-to-country linkages varied from 1 to 55. The top 3 countries having the largest number of collaborative linkages (221, 143, and 118) were for authors from USA, UK, and Canada. The largest country-to-country collaborative linkages (55) were between the authors from USA–Canada, followed by USA–UK (31 linkages), USA–Italy (24 linkages), etc. (Table 2).

Subject-Wise Distribution of Publications

According to the Scopus database classification, the largest share (85.99%) of publications was listed under the category of medicine, followed by psychology (10.03%); pharmacology, toxicology, and pharmaceuticals (9.79%); neurosciences (5.95%); biochemistry, genetics, and molecular biology (5.86%), etc. In terms of impact publications, the publications listed under the category of environment science registered the highest CPP (11.02), and the publications listed under the category of pharmacology, toxicology, and pharmaceuticals had the least CPP (5.70) as given in Table 3.

Types of Substance Used

In terms of type of substance, the largest number of publications focused on alcohol (38.05%), followed by opioids (16.35%); tobacco (13.87%); cannabis, nicotine, and buprenorphine (6.46%, 6.18%, and 5.95%, respectively); methadone, benzodiazepine, and fentanyl (4.99%, 4.95%, and 2.66%, respectively); morphine, caffeine, and amphetamines (1.97%, 1.83%, and 1.05%, respectively); and nine others (from 0.09% to 0.96%). In terms of research impact, papers on nicotine registered the highest (20.28) CPP, followed by alcohol (12.55), nicotine (10.13), tobacco (9.07), methylphenidate (8.0), benzodiazepine and hypnotics (7.80 each), methadone (6.62), opioids (6.57), cannabis (6.18), etc. The combined output of opioids, buprenorphine, methadone, morphine, and fentanyl constitutes 408 papers, which received 2839 citations, averaging 6.96 CPP (Table 4).

Substance Use by Population Age Group

On classifying the publications by population age, publications focusing on the adult population constituted the largest number (with a 46.61% share), followed by those focusing on middle-aged (24.18%) participants, adolescents (12.68%), children (6.50%), and elderly (1.92%; Table 5).

Table 4. Publication Distribution by Type of Substance Used in COVID-19.

S. No.	Type of Substance	TP	TC	CPP	%TP	S. No.	Type of Substance	TP	TC	CPP	%TP
1	Alcohol	831	10,432	12.55	38.05	12	Amphetamines	23	111	4.83	1.05
2	Opioids	357	2346	6.57	16.35	13	Oxycodone	21	96	4.57	0.96
3	Tobacco	303	2747	9.07	13.87	14	Stimulants	17	25	1.47	0.78
4	Cannabis	141	871	6.18	6.46	15	Marijuana	16	41	2.56	0.73
5	Nicotine	135	1394	10.33	6.18	16	Codeine	11	52	4.73	0.50
6	Buprenorphine	130	709	5.45	5.95	17	Anxiolytics	9	54	6.00	0.41
7	Methadone	109	722	6.62	4.99	18	Methylphenidate	6	48	8.00	0.27
8	Benzodiazepine	108	842	7.80	4.95	19	Hypnotics	5	39	7.80	0.23
9	Fentanyl	58	248	4.28	2.66	20	Hallucinogens	2	2	1.00	0.09
10	Morphine	43	234	5.44	1.97	21	Barbiturate	2	6	3.00	0.09
11	Caffeine	40	811	20.28	1.83	–	Global total	2184	–	0.00	100.00

Abbreviations: TP, total papers; TC, total citations; CPP, citations per paper.

Table 5. Classification of Papers by Population Age Groups.

S. No.	Type of Population Age Group	TP	TC	CPP	%TP
1	Adults	1018	11,120	10.92	46.61
2	Middle aged	528	6784	12.85	24.18
3	Adolescents	277	3548	12.81	12.68
4	Children	142	1824	12.85	6.50
5	Elderly	42	729	17.36	1.92
–	Global total	2184	–	0.00	100.00

Abbreviations: TP, total papers; TC, total citations; CPP, citations per paper.

Profile of the Top 15 Organizations

Overall, the publications emerged from 566 organizations with authors from 349 organizations publishing 1 to 5 papers each, authors from another 149 organizations publishing 6 to 10 papers each, authors from 49 organizations publishing 11 to 20 papers each, and authors from 19 organizations publishing 21 to 52 papers each. The authors from the top 15 organizations contributed 24 to 52 papers and together contributed 455 papers and 5323 citations, constituting 20.83% and 25.14% shares, respectively, in global publications and citations. On further analysis, it was seen that authors from three organizations contributed papers higher than their group average (30.33), and these organizations were as follows: Harvard Medical School, USA (52 papers); University of Toronto, Canada (47 papers); and Yale School of Medicine, USA (35 papers). Research studies from the following four organizations registered CPP and RCI above their group average (11.70 and 1.23): University College London, UK (30.24 and 3.12); INSERM, France (22.0 and 2.27); Sapienza University of Rome, Italy (17.4 and 1.8); and University of Toronto, Canada (13.68 and 1.41) as given in Table 6.

Profile of the Top 15 Authors

Overall, 1554 authors contributed to the research on the topic, with 954 authors publishing 1 paper each, 437 authors publishing 2 papers each, 105 authors publishing 3 papers

each, 47 authors publishing 4 to 5 papers each, and 12 authors publishing 6 to 12 papers each. The top 15 authors individually contributed to 5 to 12 papers each, and together, they contributed to 103 papers and 631 citations, constituting 4.72% and 2.89% share of global papers and citations respectively. On further analysis, it was observed that five authors registered CPP (14.4 and 1.49) and RCI above the group average (6.13 and 0.63), and they were J. Mantney (20.17 and 2.13), J. Brown (14.4 and 1.39), J. Rehm (13.08 and 1.35), S. Callinan (7.0 and 0.72), and S. Grover (6.67 and 0.69) as given in Table 7.

Profile of the Top 15 Journals

Of the total 2184 global publications on the studied topic, 2178 publications were published in 307 journals, 2 each as a part of book series, trade journal, and conference proceedings. In terms of various journals, 251 journals published 1 to 5 papers each, 31 journals published 6 to 10 papers each, 19 journals published 11 to 20 papers each, 4 journals published 21 to 50 papers each, and 1 journal published 73 and 83 papers, respectively. The top 15 journals that published the most papers are shown in Table 8, and these 15 journals contributed 433 papers, constituting a 19.88% share of total journal publications in this research field.

On further analysis, it was found that the top five most productive journals include the *International Journal of Environmental Research and Public Health* (83 papers),

Table 6. Profile of the Top 15 Most Productive Organizations on “COVID-19 and Substance Use.”

S. No.	Name of the Organization	TP	TC	CPP	HI	ICP	%ICP	RCI
1	Harvard Medical School, USA	52	511	9.83	13	11	21.15	1.01
2	University of Toronto, Canada	47	643	13.68	12	28	59.57	1.41
3	Yale School of Medicine, USA	35	342	9.77	7	12	34.29	1.01
4	INSERM, France	29	638	22.00	10	11	37.93	2.27
5	University of British Columbia, Canada	28	270	9.64	10	10	35.71	1.00
6	Brown University, USA	28	95	3.39	5	6	21.43	0.35
7	Center for Addition and Mental Health, Institute of Mental Health Policy Research, Canada	28	289	10.32	9	14	50.00	1.07
8	University of California, San Francisco, USA	28	273	9.75	8	3	10.71	1.01
9	VA Medical Center, USA	27	271	10.04	7	2	7.41	1.04
10	Massachusetts General Hospital, USA	27	245	9.07	9	3	11.11	0.94
11	Columbia University, USA	27	67	2.48	4	7	25.93	0.26
12	King's College London, UK	25	219	8.76	9	12	48.00	0.90
13	University College London, UK	25	756	30.24	10	9	36.00	3.12
14	Sapienza University of Rome, Italy	25	435	17.40	9	13	52.00	1.80
15	The Warren Alpert Medical School, Brown University, USA	24	269	11.21	8	6	25.00	1.16
–	Total of top 15 organizations	455	5323	11.70	130	147	32.31	1.21
–	Global total	2184	21,170	9.69	–	–	–	–
–	Share of top 15 organizations in global total	20.83	25.14	–	–	–	–	–

Abbreviations: TP, total papers; TC, total citations; CPP, citations per paper; ICP, international collaborative paper; RCI, relative citation index.

Table 7. Profile of the Top 15 Most Productive Authors on “COVID-19 and Substance Use.”

S. No.	Name of the Author	Affiliation of the Author	TP	TC	CPP	HI	ICP	%ICP	RCI
1	A. Ghosh	Postgraduate Institute of Medical Education and Research, Chandigarh	12	30	2.5	4	4	33.33	0.26
2	J. Rehm	Center for Addition and Mental Health, Institute of Mental Health Policy Research, Canada	12	157	13.08	5	11	91.67	1.35
3	A. Arya	PBDS University of Health Sciences, Rohtak	7	34	4.86	3	5	71.43	0.50
4	N. El-Bassel	Columbia University, USA	7	29	4.14	4	0	0.00	0.43
5	C. Kilian	Universitätsklinikum Hamburg-Eppendorf, Germany	7	12	1.71	3	7	100.00	0.18
6	D. Basu	Postgraduate Institute of Medical Education and Research, Chandigarh	7	23	—	3	1	14.29	0.00
7	M. Goldust	Universitätsspital Basel, Switzerland	6	20	3.33	3	6	100.00	0.34
8	P. Grandinetti	ASI Teramo, Italy	6	12	2	2	5	83.33	0.21
9	S. Grover	Postgraduate Institute of Medical Education and Research, Chandigarh	6	40	6.67	2	0	0.00	0.69
10	A. Gual	Institut d'Investigacions Biomèdiques August Pi i Sunyer, Spain	6	16	2.67	2	5	83.33	0.28
11	J. Manthey	Universitätsklinikum Hamburg-Eppendorf, Germany	6	124	20.17	2	6	100.00	2.13
12	K. Siste	Universitas Indonesia RSUPND-Cipto Mangunkusumo Hospital, Indonesia	6	11	1.83	2	5	83.33	0.19
13	J. Brown	University College London, UK	5	72	14.4	4	0	0.00	1.49
14	S. Callinan	La Trobe University, Australia	5	35	7	3	2	40.00	0.72
15	G. Kroumpouzou	Medical School of Juridua, Brazil	5	16	3.2	3	5	100.00	0.33
—	—	Total of the top 15 authors	103	631	6.13	45	62	60.19	0.63
—	—	Global total	2184	21170	9.69	—	—	—	—
—	—	Share of the top 15 authors in global total	4.72	2.98	—	—	—	—	—

Abbreviations: TP, total papers; TC, total citations; CPP, citations per paper; ICP, international collaborative paper; RCI, relative citation index.

Table 8. Profile of the Top 15 Journals on “COVID-19 and Substance Use.”

S. No.	Name of the Journal	TP	TC	CPP
1	<i>International Journal of Environmental Research and Public Health</i>	83	1072	12.92
2	<i>Journal of Substance Abuse Treatment</i>	73	106	1.45
3	<i>Frontiers in Psychiatry</i>	39	207	5.31
4	<i>Drug and Alcohol Dependence</i>	28	155	5.54
5	<i>International Journal of Drug Policy</i>	26	79	3.04
6	<i>PLoS One</i>	23	112	4.87
7	<i>Addiction</i>	20	106	5.3
8	<i>Journal of Adolescent Health</i>	20	184	9.2
9	<i>Psychiatry Research</i>	20	277	13.85
10	<i>BMJ Open</i>	19	73	3.84
11	<i>Drug and Alcohol Review</i>	19	205	10.79
12	<i>Asian Journal of Psychiatry</i>	18	493	27.39
13	<i>Nutrients</i>	17	454	26.71
14	<i>BMJ</i>	14	111	7.93
15	<i>Journal of Addiction Medicine</i>	14	159	11.36
—	Total of top 15 journals	433	3793	—
—	Global total	2178	—	—
—	Share of top 15 journals in global total	19.88	—	—

Abbreviations: TP, total papers; TC, total citations; CPP, citations per paper.

Journal of Substance Abuse Treatment (73 papers), *Frontiers in Psychology* (39 papers), *Drug and Alcohol Dependence* (28 papers), and *International Journal of Drug Policy*. The top five journals in terms of CPP were the *Asian Journal of Psychiatry* (27.39), *Nutrients* (26.71), *Psychiatry Research* (13.85), *International Journal of Environmental Research and Public Health* (12.92), and *Journal of Addiction Medicine* (11.36; Table 8).

Highly Cited Papers

Out of 2184 publications on “COVID-19 and Substance Use”, only 30 (1.37) publications were cited more than 100 times, with the highest number of citations being 1903 since the publication, and together, these 30 papers were cited 9102 times, averaging 303.4 CPP. Among 30 high-cited publications, 17 papers received 101 to 188 citations, 6 papers received 204 to 286 citations, 5 papers received 377 to 577 citations, and 2 papers received 1358 to 1903 citations.

Among 30 high-cited papers, the largest number of publications (9 papers each) were published by authors from UK and USA, followed by China (8 papers); Italy (5 papers); Australia and Canada (4 papers each); Switzerland (3 papers); Russia, Singapore, and Taiwan (6 papers each); etc.

Discussion

The present study showed that over a period of about 2 years, a large amount of literature has accumulated on the topic of substance use disorders and COVID-19. The total number of papers published on the topic were 2184 during the years 2020 and 2021, up to November 17, 2021. These publications were cited 21,170 times with a CPP of 9.69. Only a small proportion (14%) of these citations were supported by extramural funding sources. However, the papers that were supported by the funding agencies had an overall CPP that was lower than the average CPP on the topic.

As there are no previous bibliometric studies on this topic, it is not possible to compare the findings of the present study with those of the existing literature. Hence, we would like to compare the findings of the present study with the bibliometric studies published in the area of mental health. When one compares these findings with the overall research output on various aspects of mental health, it can be said that research studies on substance use disorders overall formed a small subgroup of all the publications; however, the CPP for the articles on substance use disorders was higher than that reported for overall mental health.⁵ The proportions of publications supported by various funding agencies were comparable for substance use disorders and overall mental health.⁵

Research studies on the area of substance use disorders emerged from 114 countries, which is again lower than 158 countries, which contributed to the research in the area of mental health. In terms of specific countries, the research on

substance use disorders parallels the research study on mental health in general, with the highest number of publications emerging from USA and UK. Similar to the publications on mental health, although the largest number of publications on substance use disorder emerged from USA, however, the research from USA did not register CPP and RCI higher than the group average.⁵

In terms of specific substances, the largest number of publications were focused on alcohol (38.05%), followed by opioids and tobacco. This distribution is understandable, considering the fact that alcohol and tobacco are licit substances. A large proportion of publications focusing on opioids can be understood in the background of the fact that opioid substitution treatment was significantly affected across the globe because of the pandemic (WHO, 2020, 2021). When the data were analyzed for specific institutions, it was evident that the maximum number of publications emerged from Harvard Medical School, USA (52 papers); followed by the University of Toronto, Canada (47 papers); the Yale School of Medicine, USA (35 papers); INSERM, France (29 papers); and the University of British Columbia, Canada (28 papers). When the impact of the organizations was evaluated by considering CPP and RCI, publications emerging from University College London, UK (30.24 and 3.12) had the maximum impact, and this was followed by INSERM, France (22.0 and 2.27); Sapienza University of Rome, Italy (17.4 and 1.8); University of Toronto, Canada (13.68 and 1.41); and The Warren Alpert Medical School, Brown University, USA (13.21 and 1.16). This trend is similar to mental health research in general during the COVID-19 pandemic.⁵

When the data were evaluated for the productivity of various authors, A. Ghosh and I. Rehm were the most productive authors, with 12 publications each. Four other authors, i.e., A. Arya, N. El-Bassel, C. Kilian, and D. Basu published seven papers each. An important thing to note here is that among the top 10 most productive authors, 4 were from India. This may possibly reflect the impact of the pandemic on persons with substance use disorders, thus forcing clinicians/researchers from India to highlight the emergent issues. When the impact of the authors was evaluated in terms of CPP and RCI, J. Manthey (20.17 and 2.13), J. Brown (14.4 and 1.39), J. Rehm (13.08 and 1.35), S. Callinan (7.0 and 0.72), and S. Grover (6.67 and 0.69) emerged at the top of the list. This finding suggests that although a large proportion of research on the topic emerged from developing countries, the same was not cited as much as the research emerging from the developed countries.

The maximum number of publications were published in the *International Journal of Environmental Research and Public Health* (83 papers), followed by the *Journal of Substance Abuse Treatment* (73 papers), *Frontiers in Psychology* (39 papers), *Drug and Alcohol Dependence* (28 papers), and *International Journal of Drug Policy*. This finding suggests that a large proportion of publications on substance use disorders during the COVID-19 pandemic

were published in journals with a broader scope, compared to those specifically focusing on problems of substance use only. With respect to the impact of the journal, the *Asian Journal of Psychiatry* (27.39) was the most impactful journal in terms of CPP. Similar trends have been seen for the *Asian Journal of Psychiatry* in the area of mental health research during the COVID-19 pandemic.⁵ This has been attributed to the change in the editorial policy to encourage the dissemination of COVID-19 research in a timely manner.

The findings of the study must be interpreted in light of its limitations. The search strategy was limited to the Scopus search engine. This could have excluded publications not listed in the Scopus database and published in regional languages. The quality of the research output was not evaluated. The CPP and citation counts were also limited to the Scopus search engine, which usually records a lower number of citations compared to Google Scholar.

To conclude, this bibliometric study shows that a significant amount of literature has emerged on the topic of substance use disorders and COVID-19 during the last two years. However, it is important to note that the research output is unevenly distributed across different countries. An important finding is that the research studies on the topic were not limited to developed countries, and in fact, the highest numbers of publications were published by researchers from India and Canada.

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