



## The top 100 cited articles on Obsessive Compulsive Disorder (OCD): A citation analysis



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### ABSTRACT

There is an exponential growth in the field of biomedical literature over the years. Although numerous articles are published every year, few of them present important conceptual advances in that particular field and are found to be influential in the evolution of the field. The number of citations a publication receives can be used as a proxy marker of its impact on the field. Hence we aimed to analyze the top cited articles ( $n = 100$ ) on obsessive compulsive disorder (OCD) as of July 2018. Google scholar database was searched using a freely available software, Publish or Perish. Information related to number of citations, publication title, publication year, name of the journal, country of origin, author details, institution of origin, article type, and article design. The original research articles were further classified into descriptive/epidemiology, mechanism, management, scale/measurement, imaging and medical psychiatry. The citation classics suggest that clinical trials/management, epidemiology and neuroimaging were the most researched areas in the OCD research. These citation classics provide an important insight into the historical developments, like the role of serotonin and caudate in OCD. This approach of citation analysis provides an opportunity to retrieve the classic articles on OCD, and describes the trends in OCD research.

### 1. Introduction

Obsessive compulsive disorder (OCD) is one of the most common psychiatric disorders and has been described in the literature for centuries. As per World Health Organization, OCD is the sixth most disabling psychiatric disorder which leads to significant disability. Descriptions of obsessions and compulsions are found in various historical documents such as *Malleus Maleficarum*, a compendium of psychopathology and witchcraft written in 15<sup>th</sup> century and in *Macbeth* written by Shakespeare in 17<sup>th</sup> century. Esquirol first described it in the psychiatric literature in 1838. By 20<sup>th</sup> century beginning, the view of OCD shifted towards having a psychological explanation. Since then, OCD has been researched extensively in the psychiatric literature.

In biomedical literature, influence of a published article is commonly gauged by the number of times the particular article is cited (Cheek et al., 2006; Garfield, 1972). Work which is deemed influential and important, is commonly read and cited by others within the field and related fields and receives a good number of citations. On the other hand, some other published articles are uncommonly or rarely cited in the literature. Thus, number of citations of a published scientific article can be considered as a proxy marker of its relative impact in the field (Qin, 2008). The term, citation classics, has been utilized to describe the

articles having at least 400 citations, and thus represents the highly cited work in that particular field (Garfield, 2010; Aksnes and Sivertsen, 2004). Identifying and analyzing these *citation classics* may provide the investigators an invaluable information about the more dominant areas of a particular field (Aksnes and Sivertsen, 2004). Also, most of these articles are written by the top experts of the field and hence may provide insight into the future directions of the field. They can be utilized to identify and monitor the outstanding scientific contributions in the area of interest. It may also help the researchers to understand what makes a scientific contribution more significant and help them identify journals and institutes in which it frequently occurs.

For the last one decade, various researchers have conducted studies which identify landmark articles in various disciplines such as anesthesia (Baltussen and Kindler, 2004), critical care medicine (Rosenberg et al., 2010), endodontics (Fardi et al., 2011), ear, nose and throat (ENT) (Fenton et al., 2002), general surgery (Paladugu et al., 2002), neurosurgery (Ponce and Lozano, 2010), obstetrics and gynecology (Brandt et al., 2010), ophthalmology (Ohba et al., 2007), orthopedics (Lefavre et al., 2011), plastic surgery (Loonen et al., 2008) and radiology (Pagni et al., 2014) among many others. Similarly, one report also identified citation classics in the field of psychiatry and suggested that the top-cited articles in the field introduced or provided reliability/

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**Table 1**  
The top 100 cited articles in Obsessive Compulsive Disorder (OCD) till date.

Rank	Citation	Article
1	7809	Goodman, W. K., Price, L. H., Rasmussen, S. A., Mazure, C., Fleischmann, R. L., Hill, C. L., ... & Charney, D. S. (1989). Yale-brown obsessive compulsive scale (Y-BOCS). <i>Arch gen psychiatry</i> , 46, 1006-1011.
2	2843	Pauls, D. L., Alsobrook II, J. P., Goodman, W., Rasmussen, S., & Leckman, J. F. (1995). A family study of obsessive-compulsive disorder. <i>The American Journal of Psychiatry</i> , 152(1), 76.
3	2592	Karno, M., Golding, J. M., Sorenson, S. B., & Burnam, M. A. (1988). The epidemiology of obsessive-compulsive disorder in five US communities. <i>Archives of general psychiatry</i> , 45(12), 1094-1099.
4	1745	Baxter, L. R., Schwartz, J. M., Bergman, K. S., Szuba, M. P., Guze, B. H., Mazzotta, J. C., ... & Phelps, M. E. (1992). Caudate glucose metabolic rate changes with both drug and behavior therapy for obsessive-compulsive disorder. <i>Archives of general psychiatry</i> , 49(9), 681-689.
5	1707	Foa, E. B., Huppert, J. D., Leiberg, S., Langner, R., Kichic, R., Hajcak, G., & Salkovskis, P. M. (2002). The Obsessive-Compulsive Inventory: development and validation of a short version. <i>Psychological assessment</i> , 14(4), 485.
6	1432	Scahill, L., Riddle, M. A., McSwiggin-Hardin, M., Ort, S. L., King, R. A., Goodman, W. K., ... & Leckman, J. F. (1997). Children's Yale-Brown obsessive compulsive scale: reliability and validity. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> , 36(6), 844-852.
7	1140	Ruscio, A. M., Stein, D. J., Chiu, W. T., & Kessler, R. C. (2010). The epidemiology of obsessive-compulsive disorder in the National Comorbidity Survey Replication. <i>Molecular psychiatry</i> , 15(1), 53.
8	1068	Hu, X. Z., Lipsky, R. H., Zhu, G., Akhtar, L. A., Taubman, J., Greenberg, B. D., ... & Murphy, D. L. (2006). Serotonin transporter promoter gain-of-function genotypes are linked to obsessive-compulsive disorder. <i>The American Journal of Human Genetics</i> , 78(5), 815-826.
9	1017	Weissman, M. M. (1998). Cross-national epidemiology of obsessive-compulsive disorder. <i>CNS Spectrums</i> , 3(S1), 6-9.
10	954	Rauch, S. L., Jenike, M. A., Alpert, N. M., Baer, L., Breiter, H. C., Savage, C. R., & Fischman, A. J. (1994). Regional cerebral blood flow measured during symptom provocation in obsessive-compulsive disorder using oxygen 15—labeled carbon dioxide and positron emission tomography. <i>Archives of general psychiatry</i> , 51(1), 62-70.
11	894	Schwartz, J. M., Stoessel, P. W., Baxter, L. R., Martin, K. M., & Phelps, M. E. (1996). Systematic changes in cerebral glucose metabolic rate after successful behavior modification treatment of obsessive-compulsive disorder. <i>Archives of general psychiatry</i> , 53(2), 109-113.
12	841	Foa, E. B., Liebowitz, M. R., Kozak, M. J., Davies, S., Campeas, R., Franklin, M. E., ... & Simpson, H. B. (2005). Randomized, placebo-controlled trial of exposure and ritual prevention, clomipramine, and their combination in the treatment of obsessive-compulsive disorder. <i>American Journal of Psychiatry</i> , 162(1), 151-161.
13	819	Rasmussen, S. A., & Tsuang, M. T. (1986). Clinical characteristics and family history in DSM-III obsessive-compulsive disorder. <i>The American journal of psychiatry</i> .
14	806	Flament, M. F., Whitaker, A., Rapoport, J. L., Davies, M., Berg, C. Z., Kalikow, K., ... & Shaffer, D. (1988). Obsessive compulsive disorder in adolescence: an epidemiological study. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> , 27(6), 764-771.
15	799	Leckman, J. F., Grice, D. E., Boardman, J., Zhang, H., Vitale, A., Bondi, C., ... & Goodman, W. K. (1997). Symptoms of obsessive-compulsive disorder. <i>American Journal of Psychiatry</i> , 154(7), 911-917.
16	762	Mataix-Cols, D., Wooderson, S., Lawrence, N., Brammer, M. J., Speckens, A., & Phillips, M. L. (2004). Distinct neural correlates of washing, checking, and hoarding symptom dimensions in obsessive-compulsive disorder. <i>Archives of general psychiatry</i> , 61(6), 564-576.
17	742	Breiter, H. C., Rauch, S. L., Kwong, K. K., Baker, J. R., Weisskoff, R. M., Kennedy, D. N., ... & Stern, C. E. (1996). Functional magnetic resonance imaging of symptom provocation in obsessive-compulsive disorder. <i>Archives of general psychiatry</i> , 53(7), 595-606.
18	737	McDougle, C. J., Goodman, W. K., Leckman, J. F., Lee, N. C., Heninger, G. R., & Price, L. H. (1994). Haloperidol addition in fluvoxamine-refractory obsessive-compulsive disorder: a double-blind, placebo-controlled study in patients with and without tics. <i>Archives of general psychiatry</i> , 51(4), 302-308.
19	700	Pauls, D. L., Towbin, K. E., Leckman, J. F., Zahner, G. E., & Cohen, D. J. (1986). Gilles de la Tourette's syndrome and obsessive-compulsive disorder: Evidence supporting a genetic relationship. <i>Archives of General Psychiatry</i> , 43(12), 1180-1182.
20	683	Foa, E. B., Kozak, M. J., Salkovskis, P. M., Coles, M. E., & Amir, N. (1998). The validation of a new obsessive-compulsive disorder scale: The Obsessive-Compulsive Inventory. <i>Psychological Assessment</i> , 10(3), 206.
21	678	Gehring, W. J., Himle, J., & Nisenson, L. G. (2000). Action-monitoring dysfunction in obsessive-compulsive disorder. <i>Psychological science</i> , 11(1), 1-6.
22	677	Mataix-Cols, D., Rauch, S. L., Manzo, P. A., Jenike, M. A., & Baer, L. (1999). Use of factor-analyzed symptom dimensions to predict outcome with serotonin reuptake inhibitors and placebo in the treatment of obsessive-compulsive disorder. <i>American Journal of Psychiatry</i> , 156(9), 1409-1416.
23	676	McDougle, C. J., Epperson, C. N., Pelton, G. H., Wasyluk, S., & Price, L. H. (2000). A double-blind, placebo-controlled study of risperidone addition in serotonin reuptake inhibitor-refractory obsessive-compulsive disorder. <i>Archives of general psychiatry</i> , 57(8), 794-801.
24	675	Swedo, S. E., Schapiro, M. B., Grady, C. L., Cheslow, D. L., Leonard, H. L., Kumar, A., ... & Rapoport, J. L. (1989). Cerebral glucose metabolism in childhood-onset obsessive-compulsive disorder. <i>Archives of general psychiatry</i> , 46(6), 518-523.
25	674	Shafraan, R., Thordarson, D. S., & Rachman, S. (1996). Thought-action fusion in obsessive compulsive disorder. <i>Journal of Anxiety Disorders</i> , 10(5), 379-391.
26	666	Nestadt, G., Samuels, J., Riddle, M., Bienvenu, O. J., Liang, K. Y., LaBuda, M., ... & Hoehn-Saric, R. (2000). A family study of obsessive-compulsive disorder. <i>Archives of general psychiatry</i> , 57(4), 358-363.
27	643	Baxter Jr, L. R., Schwartz, J. M., Mazzotta, J. C., Phelps, M. E., & Pahl, J. J. (1988). Cerebral glucose metabolic rates in nondepressed patients with obsessive-compulsive disorder. <i>The American journal of psychiatry</i> , 145(12), 1560.
28	630	Pediatric, O. C. D. (2004). Cognitive-behavior therapy, sertraline, and their combination for children and adolescents with obsessive-compulsive disorder: the Pediatric OCD Treatment Study (POTS) randomized controlled trial. <i>Jama</i> , 292(16), 1969.
29	626	Greenberg, B. D., Malone, D. A., Friehs, G. M., Rezai, A. R., Kubu, C. S., Malloy, P. F., ... & Rasmussen, S. A. (2006). Three-year outcomes in deep brain stimulation for highly resistant obsessive-compulsive disorder. <i>Neuropsychopharmacology</i> , 31(11), 2384.
30	622	Mallet, L., Polosan, M., Jaafari, N., Baup, N., Welter, M. L., Fontaine, D., ... & Raoul, S. (2008). Subthalamic nucleus stimulation in severe obsessive-compulsive disorder. <i>New England Journal of Medicine</i> , 359(20), 2121-2134.
31	621	Jefferson, J. W., Kobak, K. A., Katzelnick, D. J., & Serlin, R. C. (1995). Efficacy and tolerability of serotonin transport inhibitors in obsessive-compulsive disorder: a meta-analysis. <i>Archives of General Psychiatry</i> , 52(1), 53-60.
32	617	Thoren, P., Åsberg, M., Cronholm, B., Jörnstedt, L., & Träskman, L. (1980). Clomipramine treatment of obsessive-compulsive disorder: I. A controlled clinical trial. <i>Archives of General Psychiatry</i> , 37(11), 1281-1285.
33	613	Bienvenu, O. J., Samuels, J. F., Riddle, M. A., Hoehn-Saric, R., Liang, K. Y., Cullen, B. A., ... & Nestadt, G. (2000). The relationship of obsessive-compulsive disorder to possible spectrum disorders: results from a family study. <i>Biological psychiatry</i> , 48(4), 287-293.
34	589	Skooog, G., & Skooog, I. (1999). A 40-year follow-up of patients with obsessive-compulsive disorder. <i>Archives of general psychiatry</i> , 56(2), 121-127.
35	578	Perlmutter, S. J., Leitman, S. F., Garvey, M. A., Hamburger, S., Feldman, E., Leonard, H. L., & Swedo, S. E. (1999). Therapeutic plasma exchange and intravenous immunoglobulin for obsessive-compulsive disorder and tic disorders in childhood. <i>The Lancet</i> , 354(9185), 1153-1158.
36	571	Rasmussen, S. A., & Eisen, J. L. (1990). Epidemiology of obsessive compulsive disorder. <i>The Journal of clinical psychiatry</i> .
37	565	Flament, M. F., Rapoport, J. L., Berg, C. J., Sceery, W., Kilts, C., Mellström, B., & Linnoila, M. (1985). Clomipramine treatment of childhood obsessive-compulsive disorder: a double-blind controlled study. <i>Archives of General Psychiatry</i> , 42(10), 977-983.
38	553	Greenberg, B. D., Gabriels, L. A., Malone Jr, D. A., Rezai, A. R., Friehs, G. M., Okun, M. S., ... & Malloy, P. F. (2010). Deep brain stimulation of the ventral internal capsule/ventral striatum for obsessive-compulsive disorder: worldwide experience. <i>Molecular psychiatry</i> , 15(1), 64.
39	538	Welch, J. M., Lu, J., Rodriguez, R. M., Trotta, N. C., Peca, J., Ding, J. D., ... & Dudek, S. M. (2007). Cortico-striatal synaptic defects and OCD-like behaviours in Sapap3-mutant mice. <i>Nature</i> , 448(7156), 894.

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Table 1 (continued)

Rank	Citation	Article
40	522	Clomipramine and exposure for obsessive-compulsive rituals: 1
41	520	The nucleus accumbens: a target for deep brain stimulation in obsessive-compulsive- and anxiety-disorders
42	504	March, J. S., Biederman, J., Wolkow, R., Safferman, A., Mardekian, J., Cook, E. H., ... & Riesenber, R. (1998). Sertraline in children and adolescents with obsessive-compulsive disorder: a multicenter randomized controlled trial. <i>Jama</i> , 280(20), 1752-1756.
43	500	Salkovskis, P. M., Wroe, A. L., Gledhill, A., Morrison, N., Forrester, E., Richards, C., ... & Thorpe, S. (2000). Responsibility attitudes and interpretations are characteristic of obsessive compulsive disorder. <i>Behaviour research and therapy</i> , 38(4), 347-372.
44	494	McGuire, P. K., Bench, C. J., Frith, C. D., Marks, I. M., Frackowiak, R. S. J., & Dolan, R. J. (1994). Functional anatomy of obsessive-compulsive phenomena. <i>The British Journal of Psychiatry</i> , 164(4), 459-468.
45	490	Calvocoressi, L., Lewis, B., Harris, M., & Trufan, S. J. (1995). Family accommodation in obsessive-compulsive disorder. <i>The American Journal of Psychiatry</i> , 152(3), 441.
46	484	Swedo, S. E., Pietrini, P., Leonard, H. L., Schapiro, M. B., Rettew, D. C., Goldberger, E. L., ... & Grady, C. L. (1992). Cerebral glucose metabolism in childhood-onset obsessive-compulsive disorder: revisualization during pharmacotherapy. <i>Archives of general psychiatry</i> , 49(9), 690-694.
47	476	Abramowitz, J. S., Franklin, M. E., Schwartz, S. A., & Furr, J. M. (2003). Symptom presentation and outcome of cognitive-behavioral therapy for obsessive-compulsive disorder. <i>Journal of Consulting and clinical psychology</i> , 71(6), 1049.
48	470	Leonard, H. L., Swedo, S. E., Rapoport, J. L., Koby, E. V., Lenane, M. C., Cheslow, D. L., & Hamburger, S. D. (1989). Treatment of obsessive-compulsive disorder with clomipramine and desipramine in children and adolescents: a double-blind crossover comparison. <i>Archives of General Psychiatry</i> , 46(12), 1088-1092.
49	470	Goodman, W. K., Price, L. H., Rasmussen, S. A., Delgado, P. L., Heninger, G. R., & Charney, D. S. (1989). Efficacy of fluvoxamine in obsessive-compulsive disorder: a double-blind comparison with placebo. <i>Archives of General Psychiatry</i> , 46(1), 36-44.
50	468	Valleni-Basile, L. A., Garrison, C. Z., Jackson, K. L., Waller, J. L., McKEOWN, R. E., Addy, C. L., & Cuffe, S. P. (1994). Frequency of obsessive-compulsive disorder in a community sample of young adolescents. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> , 33(6), 782-791.
51	468	Mataix-Cols, D., Marks, I. M., Greist, J. H., Kobak, K. A., & Baer, L. (2002). Obsessive-compulsive symptom dimensions as predictors of compliance with and response to behavior therapy: results from a controlled trial. <i>Psychotherapy and psychosomatics</i> , 71(5), 255-262.
52	460	Chamberlain, S. R., Fineberg, N. A., Blackwell, A. D., Robbins, T. W., & Sahakian, B. J. (2006). Motor inhibition and cognitive flexibility in obsessive-compulsive disorder and trichotillomania. <i>American Journal of Psychiatry</i> , 163(7), 1282-1284.
53	460	Abelson, J. L., Curtis, G. C., Sagher, O., Albuher, R. C., Harrigan, M., Taylor, S. F., ... & Giordani, B. (2005). Deep brain stimulation for refractory obsessive-compulsive disorder. <i>Biological psychiatry</i> , 57(5), 510-516.
54	458	Zohar, J., Mueller, E. A., Insel, T. R., Zohar-Kadouch, R. C., & Murphy, D. L. (1987). Serotonergic responsivity in obsessive-compulsive disorder: comparison of patients and healthy controls. <i>Archives of General Psychiatry</i> , 44(11), 946-951.
55	458	Savage, C. R., Baer, L., Keuthen, N. J., Brown, H. D., Rauch, S. L., & Jenike, M. A. (1999). Organizational strategies mediate nonverbal memory impairment in obsessive-compulsive disorder. <i>Biological psychiatry</i> , 45(7), 905-916.
56	457	Insel, T. R., Murphy, D. L., Cohen, R. M., Alterman, I., Kilts, C., & Linnoila, M. (1983). Obsessive-compulsive disorder: a double-blind trial of clomipramine and clorgyline. <i>Archives of General Psychiatry</i> , 40(6), 605-612.
57	451	Barrett, P., Healy-Farrell, L., & March, J. S. (2004). Cognitive-behavioral family treatment of childhood obsessive-compulsive disorder: a controlled trial. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> , 43(1), 46-62.
58	438	Nordahl, T. E., Benkelfat, C., Semple, W. E., Gross, M., King, A. C., & Cohen, R. M. (1989). Cerebral glucose metabolic rates in obsessive compulsive disorder. <i>Neuropsychopharmacology</i> .
59	431	Insel, T. R., Mueller, E. A., Alterman, I., Linnoila, M., & Murphy, D. L. (1985). Obsessive-compulsive disorder and serotonin: is there a connection?. <i>Biological psychiatry</i> , 20(11), 1174-1188.
60	431	Benkelfat, C., Nordahl, T. E., Semple, W. E., King, A. C., Murphy, D. L., & Cohen, R. M. (1990). Local cerebral glucose metabolic rates in obsessive-compulsive disorder: patients treated with clomipramine. <i>Archives of General Psychiatry</i> , 47(9), 840-848.
61	430	Piacentini, J., Bergman, R. L., Keller, M., & McCracken, J. (2003). Functional impairment in children and adolescents with obsessive-compulsive disorder. <i>Journal of child and adolescent psychopharmacology</i> , 13(2, Supplement 1), 61-69.
62	425	Leonard, H. L., Lenane, M. C., Swedo, S. E., Rettew, D. C., Gershon, E. S., & Rapoport, J. L. (1992). Tics and Tourette's disorder: a 2-to 7-year follow-up of 54 obsessive-compulsive children. <i>Am J Psychiatry</i> , 149(9), 1244-1251.
63	422	Franklin, M. E., Abramowitz, J. S., Kozak, M. J., Levitt, J. T., & Foa, E. B. (2000). Effectiveness of exposure and ritual prevention for obsessive-compulsive disorder: randomized compared with nonrandomized samples. <i>Journal of consulting and clinical psychology</i> , 68(4), 594.
64	421	do Rosario-Campos, M. C., Leckman, J. F., Mercadante, M. T., Shavitt, R. G., Prado, H. D. S., Sada, P., ... & Miguel, E. C. (2001). Adults with early-onset obsessive-compulsive disorder. <i>American Journal of Psychiatry</i> , 158(11), 1899-1903.
65	420	Koran, L. M., Thienemann, M. L., & Davenport, R. (1996). Quality of life for patients with obsessive-compulsive disorder. <i>The American Journal of Psychiatry</i> , 153(6), 783.
66	420	Denys, D., Mantione, M., Fige, M., van den Munckhof, P., Koerselman, F., Westenberg, H., ... & Schuurman, R. (2010). Deep brain stimulation of the nucleus accumbens for treatment-refractory obsessive-compulsive disorder. <i>Archives of general psychiatry</i> , 67(10), 1061-1068.
67	410	DeVaugh-Geiss, J., Moroz, G., Biederman, J., Cantwell, D., Fontaine, R., Greist, J. H., ... & Landau, P. (1992). Clomipramine hydrochloride in childhood and adolescent obsessive-compulsive disorder—a multicenter trial. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> , 31(1), 45-49.
68	401	Thorén, P., Åsberg, M., Bertilsson, L., Mellström, B., Sjöqvist, F., & Träskman, L. (1980). Clomipramine treatment of obsessive-compulsive disorder: II. Biochemical aspects. <i>Archives of General Psychiatry</i> .
69	393	Pujol, J., Soriano-Mas, C., Alonso, P., Cardoner, N., Menchón, J. M., Deus, J., & Vallejo, J. (2004). Mapping structural brain alterations in obsessive-compulsive disorder. <i>Archives of general psychiatry</i> , 61(7), 720-730.
70	391	Riddle, M. A., Seahill, L., King, R. A., Hardin, M. T., Anderson, G. M., Ort, S. I., ... & Cohen, D. J. (1992). Double-blind, crossover trial of fluoxetine and placebo in children and adolescents with obsessive-compulsive disorder. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> , 31(6), 1062-1069.
71	390	Saxena, S., Brody, A. L., Maidment, K. M., Dunkin, J. J., Colgan, M., Alborzian, S., ... & Baxter Jr, L. R. (1999). Localized orbitofrontal and subcortical metabolic changes and predictors of response to paroxetine treatment in obsessive-compulsive disorder. <i>Neuropsychopharmacology</i> , 21(6), 683-693.
72	389	Wilhelm, S., Buhlmann, U., Tolin, D. F., Meunier, S. A., Pearson, G. D., Reese, H. E., ... & Rauch, S. L. (2008). Augmentation of behavior therapy with D-cycloserine for obsessive-compulsive disorder. <i>American journal of psychiatry</i> , 165(3), 335-341.
73	388	Purcell, R., Maruff, P., Kyrios, M., & Pantelis, C. (1998). Neuropsychological deficits in obsessive-compulsive disorder: a comparison with unipolar depression, panic disorder, and normal controls. <i>Archives of General Psychiatry</i> , 55(5), 415-423.
74	387	Chamberlain, S. R., Menzies, L., Hampshire, A., Suckling, J., Fineberg, N. A., del Campo, N., ... & Robbins, T. W. (2008). Orbitofrontal dysfunction in patients with obsessive-compulsive disorder and their unaffected relatives. <i>Science</i> , 321(5887), 421-422.
75	386	Hanna, G. L. (1995). Demographic and clinical features of obsessive-compulsive disorder in children and adolescents. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> , 34(1), 19-27.
76	381	Kushner, M. G., Kim, S. W., Donahue, C., Thuras, P., Adson, D., Kotlyar, M., ... & Foa, E. B. (2007). D-cycloserine augmented exposure therapy for obsessive-compulsive disorder. <i>Biological psychiatry</i> , 62(8), 835-838.
77	380	Harrison, B. J., Soriano-Mas, C., Pujol, J., Ortiz, H., López-Solà, M., Hernández-Ribas, R., ... & Menchon, J. M. (2009). Altered corticostriatal functional connectivity in obsessive-compulsive disorder. <i>Archives of general psychiatry</i> , 66(11), 1189-1200.

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Table 1 (continued)

Rank	Citation	Article
78	379	Ursu, S., Stenger, V. A., Shear, M. K., Jones, M. R., & Carter, C. S. (2003). Overactive action monitoring in obsessive-compulsive disorder: evidence from functional magnetic resonance imaging. <i>Psychological Science</i> , 14(4), 347-353.
79	378	Menzies, L., Achard, S., Chamberlain, S. R., Fineberg, N., Chen, C. H., Del Campo, N., ... & Bullmore, E. (2007). Neurocognitive endophenotypes of obsessive-compulsive disorder. <i>Brain</i> , 130(12), 3223-3236.
80	376	van den Heuvel, O. A., Veltman, D. J., Groenewegen, H. J., Cath, D. C., van Balkom, A. J., van Hartkamp, J., ... & van Dyck, R. (2005). Frontal-striatal dysfunction during planning in obsessive-compulsive disorder. <i>Archives of general psychiatry</i> , 62(3), 301-309.
81	372	Szeszko, P. R., Robinson, D., Alvir, J. M. J., Bilder, R. M., Lencz, T., Ashtari, M., ... & Bogerts, B. (1999). Orbital frontal and amygdala volume reductions in obsessive-compulsive disorder. <i>Archives of general psychiatry</i> , 56(10), 913-919.
82	371	McLean, P. D., Whittal, M. L., Thordarson, D. S., Taylor, S., Söchtling, I., Koch, W. J., ... & Anderson, K. W. (2001). Cognitive versus behavior therapy in the group treatment of Obsessive-Compulsive disorder. <i>Journal of consulting and clinical psychology</i> , 69(2), 205.
83	370	Behar, D., Rapoport, J. L., Berg, C. J., Denckla, M. B., Mann, L., Cox, C., ... & Wolfman, M. G. (1984). Computerized tomography and neuropsychological test measures in adolescents with obsessive-compulsive disorder. <i>The American journal of psychiatry</i> .
84	369	Riddle, M. A., Reeve, E. A., Yaryura-Tobias, J. A., Yang, H. M., Claghorn, J. L., Gaffney, G., ... & Walkup, J. T. (2001). Fluvoxamine for children and adolescents with obsessive-compulsive disorder: a randomized, controlled, multicenter trial. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> , 40(2), 222-229.
85	368	Karayorgou, M., Altemus, M., Galke, B. L., Goldman, D., Murphy, D. L., Ott, J., & Gogos, J. A. (1997). Genotype determining low catechol-O-methyltransferase activity as a risk factor for obsessive-compulsive disorder. <i>Proceedings of the National Academy of Sciences</i> , 94(9), 4572-4575.
86	367	Purcell, R., Maruff, P., Kyrios, M., & Pantelis, C. (1998). Neuropsychological deficits in obsessive-compulsive disorder: a comparison with unipolar depression, panic disorder, and normal controls. <i>Archives of General Psychiatry</i> , 55(5), 415-423.
87	366	Douglass, H. M., Moffitt, T. E., Dar, R., McGee, R. O. B., & Silva, P. (1995). Obsessive-compulsive disorder in a birth cohort of 18-year-olds: prevalence and predictors. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> , 34(11), 1424-1431.
88	365	Perani, D., Colombo, C., Bressi, S., Bonfanti, A., Grassi, F., Scarone, S., ... & Fazio, F. (1995). [18 F] FDG PET Study in Obsessive-Compulsive Disorder: A Clinical/Metabolic Correlation Study after Treatment. <i>The British Journal of Psychiatry</i> , 166(2), 244-250.
89	364	Luxenberg, J. S., Swedo, S. E., Flament, M. F., Friedland, R. P., Rapoport, J., & Rapoport, S. I. (1988). Neuroanatomical abnormalities in obsessive-compulsive disorder detected with quantitative X-ray computed tomography. <i>The American Journal of Psychiatry</i> , 145(9), 1089.
90	363	Lenane, M. C., Swedo, S. E., Leonard, H., Pauls, D. L., Sceery, W., & Rapoport, J. L. (1990). Psychiatric disorders in first degree relatives of children and adolescents with obsessive compulsive disorder. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> , 29(3), 407-412.
91	363	Purcell, R., Maruff, P., Kyrios, M., & Pantelis, C. (1998). Cognitive deficits in obsessive-compulsive disorder on tests of frontal-striatal function. <i>Biological psychiatry</i> , 43(5), 348-357.
92	362	Frost, R. O., & Steketee, G. (1997). Perfectionism in obsessive-compulsive disorder patients. <i>Behaviour research and therapy</i> , 35(4), 291-296.
93	362	Tollefson, G. D., Rampey, A. H., Potvin, J. H., Jenike, M. A., Rush, A. J., Dominguez, R. A., ... & Genduso, L. A. (1994). A multicenter investigation of fixed-dose fluoxetine in the treatment of obsessive-compulsive disorder. <i>Archives of General Psychiatry</i> , 51(7), 559-567.
94	360	Rosenberg, D. R., MacMaster, F. P., Keshavan, M. S., Fitzgerald, K. D., Stewart, C. M., & Moore, G. J. (2000). Decrease in caudate glutamatergic concentrations in pediatric obsessive-compulsive disorder patients taking paroxetine. <i>Journal of the American Academy of Child &amp; Adolescent Psychiatry</i> , 39(9), 1096-1103.
95	358	Goodman, W. K., Price, L. H., Delgado, P. L., Palumbo, J., Krystal, J. H., Nagy, L. M., ... & Charney, D. S. (1990). Specificity of serotonin reuptake inhibitors in the treatment of obsessive-compulsive disorder: comparison of fluvoxamine and desipramine. <i>Archives of General Psychiatry</i> , 47(6), 577-585.
96	355	Samuels, J., Bienvenu III, O. J., Riddle, M. A., Cullen, B. A. M., Grados, M. A., Liang, K. Y., ... & Nestadt, G. (2002). Hoarding in obsessive compulsive disorder: results from a case-control study. <i>Behaviour research and therapy</i> , 40(5), 517-528.
97	355	van den Heuvel, O. A., Veltman, D. J., Groenewegen, H. J., Witter, M. P., Merkelbach, J., Cath, D. C., ... & van Dyck, R. (2005). Disorder-specific neuroanatomical correlates of attentional bias in obsessive-compulsive disorder, panic disorder, and hypochondriasis. <i>Archives of general psychiatry</i> , 62(8), 922-933.
98	351	Pato, M. T., Murphy, D. L., Zohar-Kadouch, R., & Zohar, J. (1988). Return of symptoms after discontinuation of clomipramine in patients with obsessive-compulsive disorder. <i>The American journal of psychiatry</i> , 145(12), 1521.
99	348	Martinot, J. L., Allilaire, J. F., Mazoyer, B. M., Hantouche, E., Huret, J. D., Legaut-Demare, F., ... & Syrota, A. (1990). Obsessive-compulsive disorder: a clinical, neuropsychological and positron emission tomography study. <i>Acta Psychiatrica Scandinavica</i> , 82(3), 233-242.
100	344	Brody, A. L., Saxena, S., Schwartz, J. M., Stoessel, P. W., Maidment, K., Phelps, M. E., & Baxter Jr, L. R. (1998). FDG-PET predictors of response to behavioral therapy and pharmacotherapy in obsessive compulsive disorder. <i>Psychiatry Research: Neuroimaging</i> , 84(1), 1-6.

validity data on rating scales for the most part (Mazhari, 2013). Specific diseases/medical illnesses have also been studied likewise such as essential tremors (Benito-Leon and Louis, 2013), epilepsy and status epilepticus (Park et al., 2017). In the field of psychiatry, an analysis of 243 citation classics in depression suggested that these articles primarily dealt with epidemiology and/or mechanism of depression while depression management was the fastest growing field (Lipsman and Lozano, 2011).

OCD is one of the most common psychiatric conditions and is associated with large global disease burden. Hence in this study, we aimed to identify and analyze top-cited articles on OCD till date. OCD was chosen as an area of interest considering its high prevalence and its impact on the society which makes this information potentially important to the various stakeholders.

## 2. Methods

We conducted a citation analysis in the field of OCD which is defined as a bibliometric method to examine the patterns and frequency of citations of published articles.

The 100 top-cited articles on OCD were identified in July 2018 using a free, publically accessible search software, named Harzing's

Publish or Perish (Harzing, 2010). Publish or Perish is a software program that retrieves and analyzes the academic citation data provided by variety of data sources including Google Scholar and Microsoft Academic Search. The software provides the raw citations and then analyses these and provides different metrics such as h-index, g-index, h-index, total number of papers and citations etc. To test the study objectives, we required a database which was up to date and publically accessible. Database such as ISI Web of Science has been found to underestimate the authors' academic citation impact. ISI only provides citation counts from the journals already listed on the ISI Web of Science, and hence, underestimates the citation counts as reported elsewhere (Meho and Yang, 2006). Other authors have reported minimal discrepancies between ISI Web of Science data and google scholar data accessed through Harzing's Publish or Perish (Lipsman and Lozano, 2011). Hence, google scholar was used as a source database considering its larger scope and accessibility and provision of more valid results due to more accurate citation counts.

We searched for all articles with the words "Obsessive compulsive disorder", "Obsessive compulsive" or "OCD" in their title using the google scholar database on the Harzing's Publish or Perish V6 software. From the results, we included the top 100 English language articles and excluded papers which were not related to OCD or were reviews, case

reports/series, books, patents, or other non-journal publications. The full texts of each of these articles were downloaded. Each article was reviewed in detail and information pertaining to following variables were entered into the specially designed MS Excel datasheet: title, number of citations, first author, number of author, country of origin, year of publication, institution etc. Country of origin was considered as a country where the study was conducted. In absence of the data, the country of first author was taken as country of origin for the study.

The articles were further classified into following categories: descriptive/epidemiology, phenomenology, clinical trial/management, scale/measurement, imaging, genetics and medical psychiatry (Lipsman and Lozano, 2011). Articles were included in descriptive/epidemiology category if they dealt with the epidemiological aspects of OCD including its incidence and prevalence, its trends, across and within countries. Articles discussing about the etiopathogenesis of the OCD including discussion on its risk factors (except genetics and imaging) were included in mechanism/phenomenology category. Clinical trial/management category was used for any article dealing with the treatment or management of OCD. Scales/measurement category included any article discussing about the development of or application and validation of a scale/measurement used for the purpose of OCD assessment. Articles dealing with neuroimaging and genetic aspects of OCD were included in respective categories. Medical psychiatry category was utilized for any paper dealing with interaction between OCD and other medical illnesses, including their epidemiological aspects, implications and relationships between them.

The study did not require institute ethics committee approval as it is a bibliometric analysis of the already published articles and did not involve human subjects.

### 2.1. Statistical analysis

The data are presented using the descriptive analysis. No tests of significance were used in this study. Data analysis was performed using SPSS V20.0.

## 3. Results

Top 1000 highest cited articles were retrieved using Publish or Perish software and top 100 cited articles were identified. Table 1 reports the top 100 cited articles in the field of OCD.

### 3.1. Top-cited articles on the field of OCD

As shown in the Table 1, the total citations ranged from 7089 to 344. The mean citation count was 657.78 (SD = 761.21) with a median of 468.00 (IQR: 660.25–382.25). Out of these 100, a total of 68 received more than 400 citations each and hence can be categorized as citation classics while 43 articles received more than 500 citations each. Number of annual citations ranged from 10.55 to 244.45 with a mean of 33.64 (SD = 31.39) and a median of 24.98 (IQR: 37.06–16.59). The most cited article in terms of number of citations received (n = 7089) was “Yale-brown obsessive compulsive scale (Y-BOCS)” published by Goodman et al., 1989 (Goodman et al., 1989). The same article also received a maximum number of citations/year.

### 3.2. Authors, country and institutions

The number of authors ranged from one to 11 with a mean of 5.15 (SD = 2.26) and a median of 4 (IQR: 6.0–4.0). First authors of the majority of the publications were from United States of America (n = 72) while 8 publications came from United Kingdom (Table 2). Sweden, Spain, Netherlands, and Australia contributed three articles each, while France and Canada contributed two articles each. Top five institutions in terms of maximum number of articles were situated in USA (Table 3). National Institute of Mental Health, USA was associated

**Table 2**

Countries of origin for the top 100-cited OCD articles (with at least two articles).

Rank	Country of origin of the articles	Number of articles
1	U. S. A	72
2	U. K.	8
3	Sweden	3
4	Spain	3
5	Netherlands	3
6	Australia	3
7	France	2
8	Canada	2

**Table 3**

Top five Institutions of origin for the top 100-cited OCD articles.

Rank	Institution	Number of articles
1	NIMH	18
2	Yale University	10
3	UCLA	07
4	Brown University	05
5	Harvard University	04

with 18 of the 100 articles while 10 articles came from Yale University.

### 3.3. Publication year

The oldest publications (n = 3) among the top 100 cited articles on the OCD dates back to 1980 while the most recent (n = 3) were published in the year of 2010 (Fig. 1). On dividing the list by the decade of publication, maximum number of articles were published during 1990–1999 (n = 42) followed by 2000–2009 (n = 36). No article published before 1980 could make into the list of top 100-cited articles on OCD. On the contrary, the articles published (n = 3) from 2010 to 2018 had the highest mean number of citations/year (88.04 ± 47.88) with citations/year ranging from 52.5 to 142.5 (Table 4, Fig. 2). The number of articles (year wise) making into the list shows a clear upward slope peaking during late 1990s and early 2000 (Fig. 3).

### 3.4. Journals

Table 4 shows the top journals contributing maximum articles in the top 100-cited OCD articles. Archives of General Psychiatry contributed a total of 35 articles followed by American Journal of Psychiatry with 17 articles, Journal of the American Academy of Child and Adolescent Psychiatry with 12 articles and Biological Psychiatry with 6 articles. Only four journals had more than five articles and contributed to 70 of those articles. Maximum number of these articles were published by JAMA network (n = 35) followed by Elsevier (n = 25) and American Psychiatric Association (n = 18). British Journal of Psychiatry, Behaviour Research and Therapy, and Journal of Consulting and Clinical Psychology contributed three articles each in the list, while Molecular Psychiatry contributed 2 articles (Table 5).

### 3.5. Study design and category

Among the 100 original research papers (Table 6), maximum number (n = 36) of articles were about the clinical trial or management of OCD, followed by articles related to neuroimaging studies in OCD (n = 31). A total of 21 articles dealt with the epidemiology or description of the OCD. Only five articles belonged to the scales/measurement category. However, among the top 10 articles, three belonged to this category. Importantly, none of the articles belonged to medical psychiatry category.

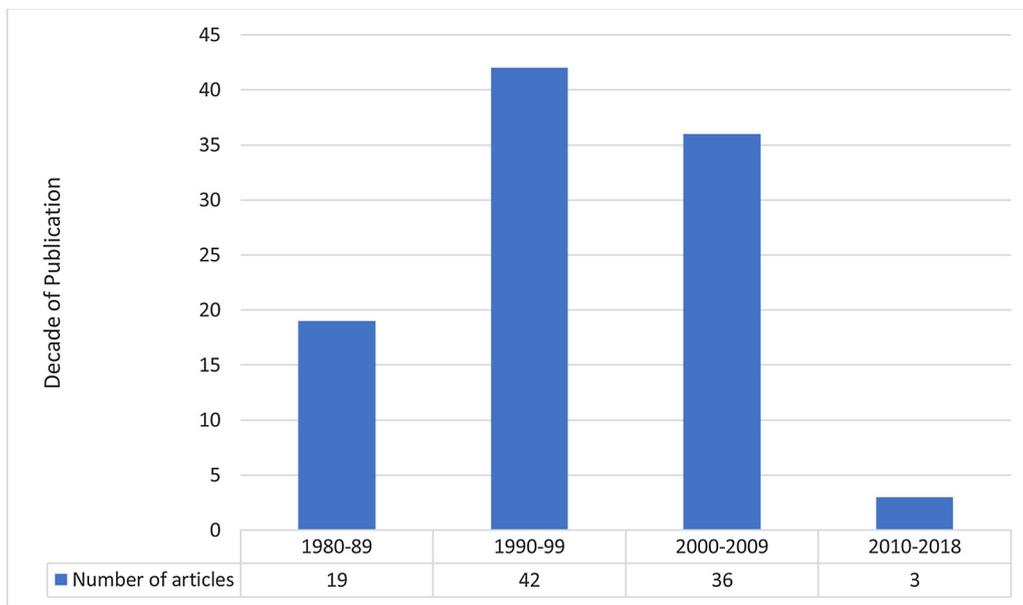


Fig. 1. Number of 100 top-cited articles in the field of OCD by decade of publication.

Table 4

Citations/year of 100 top-cited articles in the field of OCD by decade of publication.

Decade	Number of articles	Minimum	Maximum	Mean	SD	Median
1980-1989	19	10.55	244.5	32.56	53.93	16.21
1990-1999	42	10.69	123.6	26.44	20.03	19.54
2000-2009	36	18.00	106.7	38.09	18.78	33.57
2009-2018	03	52.5	142.5	88.04	47.88	69.13

4. Discussion

In the biomedical literature, the impact and the influence of a publication is frequently measured by the number of times other authors cite that particular publication (Cheek et al., 2006). And hence, citation analysis is widespread across the specialties, including in areas related to neuroscience (Park et al., 2017; Ponce and Lozano, 2010). Citation analysis is based on the premise that these articles are more likely to be authored by the experts in the particular field and demonstrates important and emerging trends. Citation analysis has been reported previously in the psychiatry field as a whole as well as in

depression (Lipsman and Lozano, 2011; Mazhari, 2013). Here we aimed to determine which OCD articles published across the journals exerted the most influence in the field by doing a citation analysis of top 100 cited OCD articles. Our study provides an encyclopedic view of the citation frequency of these articles which may be informative to those who want to find the history, progress, growth, and areas of intensive research in OCD field.

The top article was cited 7089 times till date. This figure appears to be far lower than that found in psychiatry in general, in which the top cited article garnered a total of 26,578 citations in a study published recently (Mazhari, 2013). On the other hand, the most cited work in depression also garnered higher citation (n = 15,590) as compared to our study. The most cited article in our study ranked 16<sup>th</sup> in the previously conducted citation analysis in psychiatry (with a citation count of 2805). This vast difference might be attributable to the fact that the previous study included articles from the ISI Web of Knowledge which is known to underestimate the citation count of a particular article as discussed earlier.

Of the included 100 articles, 68 articles had more than 400 citations each. This number is particularly informative when we compare it to other illnesses. For e.g. the total number of citation classics in depression were 243. Despite OCD being a common neuropsychiatric disorder,

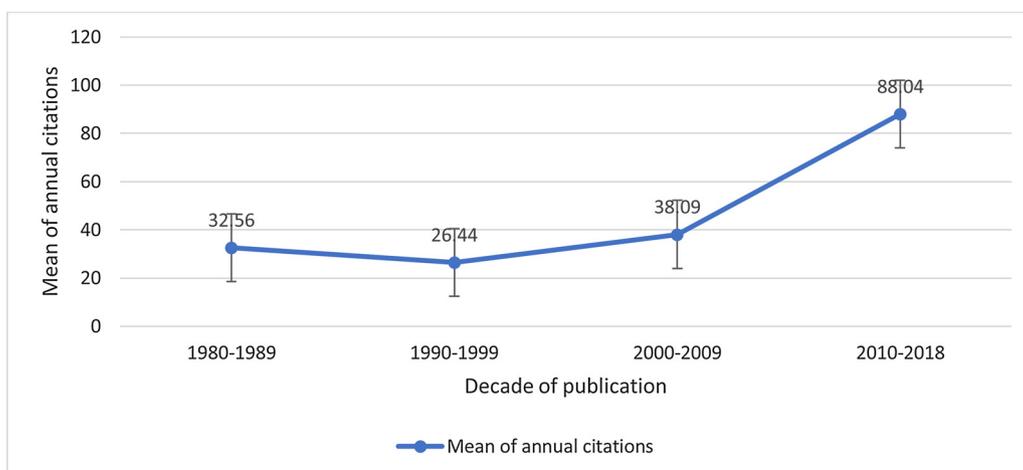


Fig. 2. Mean number of citations/year of 100 top-cited articles in the field of OCD by decade of publication.

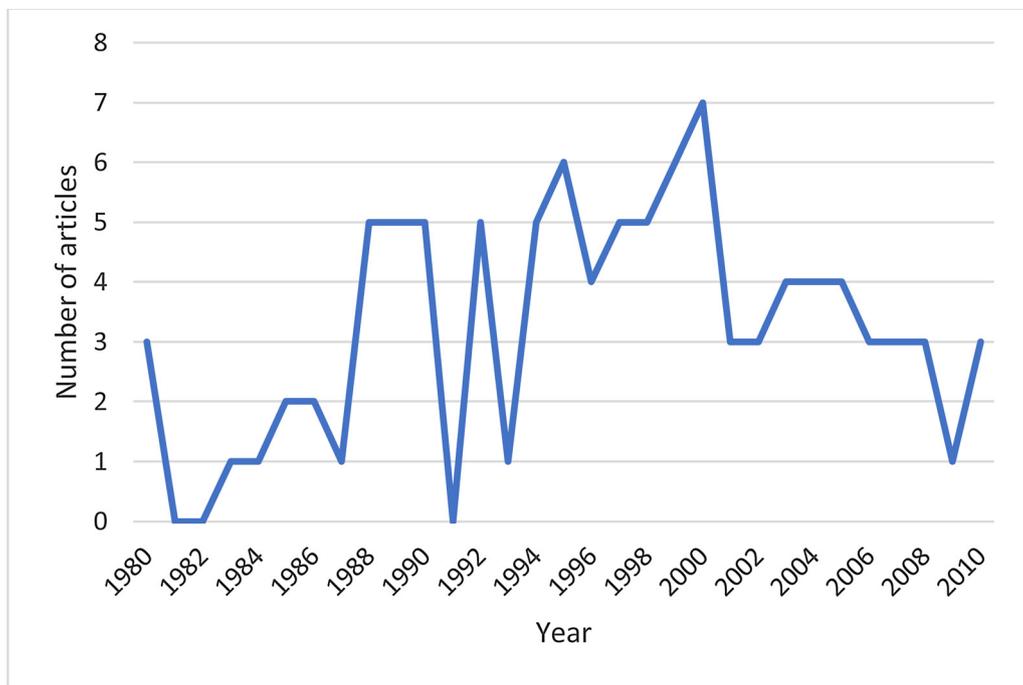


Fig. 3. Number of citation classics published – year wise.

Table 5

Journals contributing maximum number of articles in the top 100-cited Obsessive Compulsive Disorder (OCD) articles.

Rank	Journal	Number of articles	Impact factor (2017)
1	Archives of General Psychiatry/ JAMA	35	16.64
2	American Journal of Psychiatry	17	13.39
3	Journal of the American Academy of Child and Adolescent Psychiatry	12	06.25
4	Biological Psychiatry	06	11.93
5	Behaviour Research and Therapy	03	04.13
5	British Journal of Psychiatry	03	05.86

the number of citation classics are relatively low. It is important to note here that the research into particular field doesn't only depend on how common or uncommon the field is. For e.g. the previous citation analysis in neurosurgery, regardless of any subspecialty reported a total of only 106 citation classics in the field as a whole (Ponce and Lozano, 2010).

Our study also suggested that majority of the articles came from the United States (72%). The previous studies in different specialties also reported similar findings e.g. anesthesia (69%) (Baltussen and Kindler, 2004), otolaryngology (84%) (Fenton et al., 2002), general surgery (78%) (Paladugu et al., 2002). Almost identical results have been reported in the psychiatry field too (76%) (Mazhari, 2013). Our results

add to the long-known fact about the overwhelming influence of United States in the biomedical literature. The dominance of United States in the biomedical literature might be also fostered by the inclination of American authors to cite their own local papers which is further supported by the tendency of the authors from other part of the world to cite more American work and to publish in American journals. This is evident in our study which reports that almost half of the articles were published in two of the American general psychiatry journals (Archives of general psychiatry and American Journal of Psychiatry). This observation suggests that even the most cited literature, because of its restriction to American and European countries might not be directly applicable to the population in other parts of the world. This finding stresses the importance of the less cited literature throughout the world, especially related to management of patients with OCD.

We noted that most of these articles were published between 1990 to 2009. Topics of these classics varied from decade to decade. We noted that the articles concerning the clinical management of OCD were published throughout the decades. Similarly, neuroimaging studies also spanned across the various decades. Thus our study provides important details of trends in the OCD research. In our study, one third of the original research articles belonged to clinical trial/management category. This is in contrast to previous studies in depression (37/243) and in psychiatry (9/100) where only a small fraction of articles contributed to the top-cited articles. This might be attributable to the fact that after the late 1960s when the first clomipramine trial was published, there was a tremendous increase on the pharmacotherapy trials and the

Table 6

The number of publications of the top 100-cited articles in the field of OCD according to the study category.

Type of article	Category	Total	2010–2018	2000–2009	1990–1999	1980–1989
Original research	Total	100	03	36	42	19
	Descriptive / Epidemiology	21	01	06	10	04
	Phenomenology	06	00	01	05	00
	Clinical trial / management	36	02	14	12	08
	Medical psychiatry	00	00	00	00	00
	Scales / Measurement	05	00	02	02	01
	Imaging	31	00	12	13	06
	Genetics	01	00	01	00	00

treatment options for OCD grown rather rapidly as compared to other illnesses (Dougherty et al., 2004). Epidemiological studies and neuroimaging studies also formed a bulk of literature. As noted by previous authors, epidemiological studies have always been influential in psychiatry literature and highlights many issues such as measurement of health impact of various psychiatric disorders, identifying the population at risk and generating theories for the etiopathogenesis (Mazhari, 2013). The higher citation received by these group of studies can be explained by the fact that the data on epidemiology and risk factors of a particular illness along with assessment scales are cited by the majority of the studies across the categories. Interestingly, contrary to the psychiatry citation study, where scale/assessment articles gave a biggest contribution to the top cited articles (43/100), only five such articles could make into our list. However, in line with the previous studies, three out of the top 10 articles (with the top most being about YBOCS scale) in our study belonged to this category. It has been reported that this category of articles is cited at a significantly higher rate as compared to other categories (Mazhari, 2013). Also, the classic measures of psychiatric disorders such as Beck Depression Inventory, Positive and Negative Syndrome Scale (PANSS), Research Diagnostic Criteria, and the SCID are known to be cited extensively any time they are used as a source material.

Our study has some important limitations. First, we only included google scholar as the searchable literature database. However, as reported earlier in methodology, there are several advantages of using google scholar for such citation analysis. Second, we included articles with terms “obsessive compulsive disorder”, “OCD” or “obsessive compulsive” in their title, and did not search for other potential terms such as “anti-obsessional”. Third, this type of bibliometric analysis does not include other forms of citations such as that in textbooks. Fourth, there is clear effect of time on the number of citation an article receives. Hence the most recent of the articles seems to be at disadvantage. This is evident in our study too where only three articles were there from the recent decade. The citation of an article usually follows a time lapse which usually is not cited for initial few years and peaks after about three to ten years (Pepe and Kurtz, 2012). However, we tried to overcome this by analysing the annual citation rates too. Fifth, language of the article is an important biasing factor with English language articles getting more citations. Six, biases inherent in the age of the database also plays a role as articles from the early 20th century or late 19th century are likely to be excluded. Seven, and most importantly, the value of citation analysis itself has been debated upon. Citation itself do not distinguish between a positive and a negative reference (Smith, 2008).

## 5. Conclusion

The present study provided a detailed list of the top cited 100 articles in the field of OCD. Our study suggested that clinical trials/management, neuroimaging and epidemiology were the most researched areas in the OCD research. Most of the top cited articles on CD originated from institutions located in USA and are published in Archives of General Psychiatry or American Journal of Psychiatry. This list should be an invaluable reference to all the students of psychiatry and to those particularly interested in field of OCD. This list provides an important insight into the historical developments in OCD and allows for the recognition of important advancement of the field. This approach of citation analysis provides an opportunity to retrieve the classic articles on OCD, and describes the trends in OCD research.

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## Conflict of interest

None.

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