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SCIENTIFIC LETTER

# Sri Lanka Published 234 Research Papers in Psychiatry from 2012 to 2021: Comparison with 76 Research Fields

## Sri Lanka publicó 234 artículos de investigación en Psiquiatría de 2012 a 2021: Análisis de las áreas de investigación

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**Dear editor:**

According to Patel et al.[1], low- and middle-income countries (LMIC) are involved in only 3 to 4 % mental health research. Furthermore the engagements of Early Career Psychiatrists (ECPs) are also dropping.[2]

While, Rohanachandra[3] highlighted the root causes of low research progress in psychiatry research in Sri Lanka. For the purpose they designed a questionnaire and emailed to 66 ECPs in Sri Lanka. They calculated the % of the type of studies ECPs were involved. For example, they focused on descriptive studies, qualitative studies, case-control studies, clinical trials, systematic reviews. They also presented the root causes of low research output and the suggestions to improve it. Their work is appreciated but it has a major limitation. The authors did not provide numerical data (or total number of publications) about the psychiatric research. It is also needed to compare the progress with other research fields. For the purpose the letter has been divided in two parts.

*Part 1*

In this part the total research output of Sri Lanka in the last ten years (2012 - 2021) was explored. The data was retrieved from Scopus database (on 08-03-2023). Total 21986 documents are published with 395157 citations or 18 citations per publications (CPP) or 1,48 Field-Weighted Citation Impact (FWCI). The highest documents are published in Medicine (n= 5704), followed by Computer Science (n= 4847), and Engineering (n= 4598). The number of publications or scholarly output (SO), citations, number of authors involved in publications, CPP and FWCI for twenty-seven (n=27) major areas are presented in table 1.

*Part 2*

In this part descriptive data of psychiatric research in Sri Lanka is provided. From 2012 to 2021, it has published 234 research papers majorly comprising of articles (n=181), reviews (n=24), letters (n=22), notes (4), errata (n=2) and 1 editorial. All documents received 3973 citations (or 17 citations per publications/CPP) with 1,22 field weighted citation impact (FWCI). It was further compared with other research areas.

Some alarming findings were noted for example:

1. Seventy-six (n=76) fields have published at least 200 research documents (table 2). The psychiatric research occupied sixty ninth (n=69) position.
2. Furthermore 147 psychiatric documents are published with international collaborations (62,8 %), with 3166 citations. These 234 documents are published in strong collaboration with 93 countries, mostly with Australia (n77), UK (n=62), USA (n-34), India (n=26) and Pakistan (n=20).
3. Or 87 documents are published with national collaboration with only 807 citations.
4. The quality of journal can be employed to depict the quality of publications. For the purpose, Scopus has categorized all journals in seven quartile (Q) groups (from Q1 - Q7). Q1 is occupied by the top 1 %, and

Q7 is occupied by journals in the 75 to 100 % group. The per year publications in different quartile groups are presented in the table 3.

**Table 1.** The research papers distribution in 27 major fields

| # | Subject Area | Scholarly Output | Citations | Citations per Publication | Field-weighted Citation Impact |
|---|---|---|---|---|---|
| 1 | Medicine | 5704 | 193354 | 33,9 | 2,7 |
| 2 | Computer Science | 4847 | 22913 | 4,7 | 0,87 |
| 3 | Engineering | 4598 | 34888 | 7,6 | 1,1 |
| 4 | Agricultural and Biological Sciences | 2930 | 42798 | 14,6 | 1,03 |
| 5 | Environmental Science | 2683 | 53685 | 20 | 1,28 |
| 6 | Social Sciences | 2573 | 19951 | 7,8 | 0,98 |
| 7 | Physics and Astronomy | 1836 | 37631 | 20,5 | 1,75 |
| 8 | Biochemistry, Genetics and Molecular Biology | 1702 | 35098 | 20,6 | 1,12 |
| 9 | Decision Sciences | 1697 | 4984 | 2,9 | 0,8 |
| 10 | Materials Science | 1479 | 13518 | 9,1 | 1,02 |
| 11 | Energy | 1450 | 13611 | 9,4 | 1,08 |
| 12 | Mathematics | 1349 | 9214 | 6,8 | 1,1 |
| 13 | Business, Management and Accounting | 1092 | 6713 | 6,1 | 0,8 |
| 14 | Earth and Planetary Sciences | 893 | 13121 | 14,7 | 1,02 |
| 15 | Chemistry | 844 | 19301 | 22,9 | 1,02 |
| 16 | Immunology and Microbiology | 822 | 13090 | 15,9 | 0,97 |
| 17 | Multidisciplinary | 769 | 16019 | 20,8 | 0,88 |
| 18 | Chemical Engineering | 706 | 9969 | 14,1 | 1,15 |
| 19 | Economics, Econometrics and Finance | 586 | 4536 | 7,7 | 1,01 |
| 20 | Pharmacology, Toxicology and Pharmaceutics | 525 | 7277 | 13,9 | 0,85 |
| 21 | Arts and Humanities | 360 | 2095 | 5,8 | 0,95 |
| 22 | Nursing | 301 | 5334 | 17,7 | 1,12 |
| 23 | Neuroscience | 203 | 4862 | 24 | 1,55 |
| 24 | Veterinary | 189 | 1642 | 8,7 | 1,05 |
| 25 | Health Professions | 187 | 3992 | 21,3 | 2,03 |
| 26 | Psychology | 186 | 2402 | 12,9 | 0,95 |
| 27 | Dentistry | 117 | 1354 | 11,6 | 1,05 |

**Table 2.** The research papers distribution in 76 minor fields

| # | Major Area | Minor Area | Scholarly Output | Citations | Citations per Publication | Field-weighted Citation Impact |
|---|---|---|---|---|---|---|
| 1 | Computer Science | Computer Science Applications | 2157 | 9061 | 4,2 | 0,8 |
| 2 | Computer Science | Computer Networks and Communications | 2040 | 6989 | 3,4 | 0,68 |
| 3 | Computer Science | Artificial Intelligence | 1739 | 5200 | 3 | 0,88 |
| 4 | Engineering | Electrical and Electronic Engineering | 1547 | 10577 | 6,8 | 1,11 |
| 5 | Computer Science | Information Systems | 1262 | 5067 | 4 | 0,76 |
| 6 | Decision Sciences | Information Systems and Management | 1237 | 3113 | 2,5 | 0,74 |
| 7 | Energy | Renewable Energy, Sustainability and the Environment | 963 | 8827 | 9,2 | 1,09 |
| 8 | Medicine | General Medicine | 937 | 105507 | 112,6 | 10,12 |
| 9 | Engineering | Civil and Structural Engineering | 923 | 5846 | 6,3 | 1,12 |

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|---|---|---|---|---|---|---|
| 10 | Medicine | Public Health, Environmental and Occupational Health | 897 | 15996 | 17,8 | 1,2 |
| 11 | Engineering | Industrial and Manufacturing Engineering | 827 | 4376 | 5,3 | 1,09 |
| 12 | Medicine | Infectious Diseases | 769 | 13343 | 17,4 | 1,03 |
| 13 | Multidisciplinary | Multidisciplinary | 769 | 16019 | 20,8 | 0,88 |
| 14 | Energy | Energy Engineering and Power Technology | 716 | 4754 | 6,6 | 0,95 |
| 15 | Agricultural and Biological Sciences | Ecology, Evolution, Behavior and Systematics | 689 | 10822 | 15,7 | 1,22 |
| 16 | Engineering | General Engineering | 646 | 4469 | 6,9 | 1,31 |
| 17 | Mathematics | Control and Optimization | 619 | 1879 | 3 | 0,85 |
| 18 | Computer Science | Hardware and Architecture | 602 | 2179 | 3,6 | 0,68 |
| 19 | Computer Science | Computer Vision and Pattern Recognition | 590 | 1813 | 3,1 | 0,63 |
| 20 | Environmental Science | Management, Monitoring, Policy and Law | 580 | 9544 | 16,5 | 1,12 |
| 21 | Agricultural and Biological Sciences | Food Science | 579 | 9491 | 16,4 | 0,91 |
| 22 | Social Sciences | Education | 579 | 3535 | 6,1 | 0,99 |
| 23 | Engineering | Control and Systems Engineering | 577 | 2703 | 4,7 | 0,77 |
| 24 | Biochemistry, Genetics and Molecular Biology | General Biochemistry,Genetics and Molecular Biology | 566 | 7608 | 13,4 | 0,77 |
| 25 | Environmental Science | Water Science and Technology | 564 | 10038 | 17,8 | 1,04 |
| 26 | Computer Science | Software | 557 | 3130 | 5,6 | 0,7 |
| 27 | Physics and Astronomy | Instrumentation | 549 | 3750 | 6,8 | 1,15 |
| 28 | Medicine | Pediatrics, Perinatology and Child Health | 535 | 3189 | 6 | 0,48 |
| 29 | Environmental Science | General Environmental Science | 534 | 10817 | 20,3 | 1,78 |
| 30 | Materials Science | General Materials Science | 530 | 6467 | 12,2 | 0,83 |
| 31 | Social Sciences | General Social Sciences | 504 | 2017 | 4 | 1,04 |
| 32 | Environmental Science | Pollution | 502 | 14311 | 28,5 | 1,23 |
| 33 | Physics and Astronomy | Nuclear and High Energy Physics | 502 | 19451 | 38,7 | 3,07 |
| 34 | Environmental Science | Waste Management and Disposal | 482 | 8086 | 16,8 | 1,06 |
| 35 | Agricultural and Biological Sciences | Agronomy and Crop Science | 478 | 6197 | 13 | 0,89 |
| 36 | Engineering | Mechanical Engineering | 477 | 5330 | 11,2 | 1,31 |
| 37 | Computer Science | General Computer Science | 454 | 3271 | 7,2 | 1,15 |
| 38 | Agricultural and Biological Sciences | Plant Science | 448 | 7853 | 17,5 | 1,21 |
| 39 | Social Sciences | Geography, Planning and Development | 445 | 7067 | 15,9 | 1,19 |
| 40 | Agricultural and Biological Sciences | Animal Science and Zoology | 442 | 3700 | 8,4 | 0,76 |
| 41 | Social Sciences | Development | 433 | 2299 | 5,3 | 0,59 |

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|---|---|---|---|---|---|---|
| 42 | Chemistry | General Chemistry | 427 | 11873 | 27,8 | 1 |
| 43 | Agricultural and Biological Sciences | General Agricultural and Biological Sciences | 426 | 4762 | 11,2 | 1,08 |
| 44 | Computer Science | Signal Processing | 416 | 1702 | 4,1 | 0,68 |
| 45 | Engineering | Building and Construction | 416 | 5268 | 12,7 | 1,14 |
| 46 | Materials Science | Materials Science (miscellaneous) | 416 | 1704 | 4,1 | 1,4 |
| 47 | Environmental Science | Environmental Engineering | 403 | 14369 | 35,7 | 1,59 |
| 48 | Medicine | Health Informatics | 372 | 1492 | 4 | 0,75 |
| 49 | Environmental Science | Ecology | 366 | 8621 | 23,6 | 1,54 |
| 50 | Environmental Science | Environmental Chemistry | 364 | 15377 | 42,2 | 1,76 |
| 51 | Physics and Astronomy | Condensed Matter Physics | 356 | 4523 | 12,7 | 0,81 |
| 52 | Immunology and Microbiology | Parasitology | 321 | 4209 | 13,1 | 0,79 |
| 53 | Engineering | Safety, Risk, Reliability and Quality | 318 | 1941 | 6,1 | 0,86 |
| 54 | Business, Management and Accounting | Management of Technology and Innovation | 313 | 1281 | 4,1 | 0,72 |
| 55 | Economics, Econometrics and Finance | General Economics,Econometrics and Finance | 308 | 1596 | 5,2 | 1,1 |
| 56 | Decision Sciences | Decision Sciences (miscellaneous) | 307 | 786 | 2,6 | 1,07 |
| 57 | Business, Management and Accounting | Strategy and Management | 288 | 2218 | 7,7 | 0,73 |
| 58 | Agricultural and Biological Sciences | Aquatic Science | 285 | 3697 | 13 | 0,98 |
| 59 | Chemical Engineering | Process Chemistry and Technology | 279 | 1861 | 6,7 | 1,46 |
| 60 | Biochemistry, Genetics and Molecular Biology | Genetics | 272 | 6095 | 22,4 | 1,1 |
| 61 | Physics and Astronomy | General Physics and Astronomy | 265 | 6697 | 25,3 | 1,61 |
| 62 | Environmental Science | Health, Toxicology and Mutagenesis | 263 | 9563 | 36,4 | 1,24 |
| 63 | Chemical Engineering | General Chemical Engineering | 262 | 3956 | 15,1 | 0,91 |
| 64 | Business, Management and Accounting | General Business,Management and Accounting | 261 | 1482 | 5,7 | 1,13 |
| 65 | Medicine | Endocrinology, Diabetes and Metabolism | 254 | 5529 | 21,8 | 1,16 |
| 66 | Biochemistry, Genetics and Molecular Biology | Biochemistry | 252 | 5497 | 21,8 | 1,29 |
| 67 | Mathematics | Modeling and Simulation | 246 | 1894 | 7,7 | 0,92 |
| 68 | Engineering | Engineering (miscellaneous) | 243 | 3291 | 13,5 | 1,72 |
| 69 | Medicine | Psychiatry and Mental Health | 234 | 3973 | 17 | 1,22 |
| 70 | Agricultural and Biological Sciences | Soil Science | 222 | 5358 | 24,1 | 1,26 |

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|---|---|---|---|---|---|---|
| 71 | Biochemistry, Genetics and Molecular Biology | Molecular Biology | 218 | 4176 | 19,2 | 0,99 |
| 72 | Materials Science | Electronic, Optical and Magnetic Materials | 212 | 2048 | 9,7 | 0,93 |
| 73 | Medicine | Microbiology (medical) | 208 | 3716 | 17,9 | 0,98 |
| 74 | Biochemistry, Genetics and Molecular Biology | Biotechnology | 206 | 2996 | 14,5 | 0,89 |
| 75 | Immunology and Microbiology | Microbiology | 203 | 3860 | 19 | 1,08 |
| 76 | Computer Science | Computer Science (miscellaneous) | 201 | 1064 | 5,3 | 1,24 |

It is apparent from the data, that the highest documents are published in Q5 (32,05 %), followed by Q4 (29,9 %), and Q6 (14,53 %).

**Table 3.** The research papers distribution is seven quartile (Q) groups

| Title | Overall | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Publications in top 1 % Scopus Sources | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 |
| Publications in top 5 % Scopus Sources | 22 | 1 | 2 | 1 | 5 | 1 | 2 | 0 | 4 | 2 | 4 |
| Publications in top 10 % Scopus Sources | 38 | 2 | 4 | 1 | 7 | 3 | 3 | 2 | 8 | 2 | 6 |
| Publications in top 25 % Scopus Sources | 108 | 8 | 5 | 5 | 14 | 8 | 8 | 7 | 16 | 16 | 21 |
| Publications in top 50 % Scopus Sources | 183 | 11 | 12 | 14 | 16 | 13 | 13 | 23 | 27 | 21 | 33 |
| Publications in top 75 % Scopus Sources | 217 | 16 | 17 | 16 | 18 | 15 | 19 | 26 | 29 | 25 | 36 |
| Publications in top 100 % Scopus Sources | 225 | 16 | 17 | 16 | 18 | 16 | 19 | 28 | 30 | 27 | 38 |

Some of the principal barriers in research as highlighted by Rohanachandra[3] are lack of technical support, funding, and poor research culture. In order to improve the research output and quality, international collaborations, grants, and research infrastructure is urgently needed.

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## FINANCING

None.

## CONFLICT OF INTEREST

No conflict of interest.

## AUTHORSHIP CONTRIBUTION

*Conceptualization:* Waseem Hassan.
*Methodology:* Waseem Hassan.
*Software:* Waseem Hassan.
*Investigation:* Waseem Hassan.

*Original writing-drafting:* Waseem Hassan.
*Writing-revision and editing:* Waseem Hassan.

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