

A Survey Proposal towards Holistic Management of Schizophrenia

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Abstract—Holistic management of schizophrenia involves mainstream pharmacological intervention, complimentary medicine intervention, therapeutic intervention and other psychosocial factors such as accommodation, education, job training, employment, relationship, friendship, exercise, overall well-being, smoking, substance abuse, suicide prevention, stigmatisation, recreation, entertainment, violent behaviour, arrangement of public trusteeship and guardianship, day-day-living skill, integration with community, and management of overweight due to medications and other health complications related to medications amongst others. Our review shows that there is no integrated survey by combining all these factors. An international web-based survey was conducted to evaluate the significance of all these factors and present them in a unified manner. It is believed this investigation will contribute positively towards holistic management of schizophrenia. There will be two surveys. In the pharmacological intervention survey, five popular drugs for schizophrenia will be chosen and their efficacy as well as harmful side effects will be evaluated on a scale of 0 -10. This survey will be done by psychiatrists. In the second survey, each element of therapeutic intervention and psychosocial factors will be evaluated according to their significance on a scale of 0 - 10. This survey will be done by care givers, psychologists, case managers and case workers. For the first survey, professional bodies of psychiatrists in English speaking countries will be contacted to request them to ask their members to participate in the survey. For the second survey, professional bodies of clinical psychologist and care givers in English speaking countries will be contacted to request them to ask their members to participate in the survey. Additionally, for both the surveys, relevant professionals will be contacted through personal contact networks. For both the surveys, mean, mode, median, standard deviation and net promoter score will be calculated for each factor and then presented in a statistically significant manner. Subsequently each factor will be ranked according to their statistical significance. Additionally, country specific variation will be highlighted to identify the variation pattern. The results of these surveys will identify the relative significance of each type of pharmacological intervention, each type of therapeutic intervention and each type of psychosocial factor. The determination of this relative importance will definitely contribute to the improvement in quality of life for individuals with schizophrenia.

Keywords—Schizophrenia, holistic management, antipsychotics, quality of life.

I. INTRODUCTION

SCHIZOPHRENIA is a brain disorder which impacts how a person acts, thinks, and perceives the world. Schizophrenia is a chronic psychiatric disorder characterized by symptoms such as delusions, hallucinations, disorganised speech and behaviours, abolition and diminished emotional

expression [1]. The cause of these symptoms has been attributed to dysregulation of dopaminergic signalling [2]. Schizophrenia is considered amongst the topmost 10 common disorders in the world [3], as about 1% of the general population suffers from the disorder [4]. Schizophrenia generally appears in sufferers in their late teens or early adulthood. However, it may appear in the middle-age group as well [5]. In some rare cases, schizophrenia may affect young children or adolescents. Generally, the earlier the occurrence of schizophrenia, the more severe the form it takes in terms of the positive and negative symptoms [6]. Schizophrenia is found to be more severe and common in men than in women [7], [8]. Although schizophrenia is a chronic disorder, it can be managed effectively with due care and management principles. With support, medication and therapy, many schizophrenia sufferers can live independently and have a satisfactory life. However, the chance of recovery is the highest, when schizophrenia is diagnosed and treated at the onset [6].

The social and economic costs of treating and caring for schizophrenia sufferers far outweigh its occurrence. The long-term disability burden related to schizophrenia is far greater compared to any other mental disorder [9]. The direct cost of schizophrenia amounts to 1.4–2.8% of national health care budgets and is almost up to 20% of the direct expenses of all types of mental health costs in most developed nations [6]. The indirect costs such as independent accommodation, financial assistance, and supported employment and training are comparable to the direct costs and may be even more.

Importantly, one aim with treating disorders is not only decreasing some of the symptoms, but also enhancing quality of life and engaging patients in everyday life (by having successful jobs, relationships etc., among others). Although there are various quantitative studies on many aspects of schizophrenia such as quantitative studies of schizophrenic behaviour, a quantitative meta-analysis of population-based studies of premorbid intelligence and schizophrenia [10], a quantitative magnetic resonance imaging study, and the Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines for the management of schizophrenia and related disorders [6], among others, there is no study to assess the relative significance of the factors associated with the holistic management of schizophrenia, which is addressed in this survey.

II. HOLISTIC MANAGEMENT OF SCHIZOPHRENIA

Holistic management of schizophrenia involves mainstream pharmacological intervention, complimentary medicine

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intervention, therapeutic intervention, relationship support, accommodation, education, job training, job placement, companionship support, independent community living, financial management, public guardianship, day-to-day living skill, and coordination between care providers and public trusteeship, among others. The present review shows that there is no unified study integrating all these factors. In this study, an international web-based survey was conducted to measure the importance of all these psychosocial factors and present them in a unified and statistically significant manner. It is believed this investigation will contribute positively towards holistic management of schizophrenia. Table I summarises various treatment, therapeutic and support options available for holistic management of schizophrenia.

III. METHODS

The survey is meant to assess the significance of various factors associated with the holistic management of schizophrenia. The study will consist of two surveys – one for the pharmacological intervention and the other for the non-pharmacological intervention. The pharmacological intervention survey will involve evaluation of second generation antipsychotic medications as well as complimentary medications. The non-pharmacological survey will involve therapeutic intervention and other non-therapeutic factors for holistic management of schizophrenia.

IV. PHARMACOLOGICAL INTERVENTION

In this web based international survey, about five second generation antipsychotic drugs will be evaluated for their efficacy. This survey will be done by psychiatrists. They will evaluate the effectiveness for the treatment of schizophrenia symptoms with these drugs on a scale of zero to 10 – with zero being the least effective and 10 being the most effective. The harmful side effects of the drugs such as overweight due to medication, resistance to insulin, tendency for obstructive sleep apnoea due to medication and other harmful side effects also will be evaluated in a scale of zero to 10 – with zero being the least harmful and 10 being the most harmful. The survey questionnaire will be sent to various professional psychiatrists on an international basis and responses from them will be captured. From these survey responses, the mean, median, mode and standard deviation values will be calculated with either back-end computing process or appropriate statistical software. In addition to these parameters, another parameter called net promoters score will also be calculated. The net promoter score [28] is a significant element to capture practitioners experience and used widely in various industries. The Net Promoter Score (NPS) represents practitioners' experience, and is a proven metric that forms the core of client experience programs the world over.

V. COMPLIMENTARY INTERVENTION

Administration of folic acid and vitamin B9 supplements has been found to reduce symptoms of schizophrenia. Other B

vitamins, including vitamins B12 and B6, are also found to be helpful. Vitamin C and E may be beneficial in treating schizophrenia. Deficiency of vitamin D was found to be a contributing factor in schizophrenia [11]. Fish oil with omega-3 reduces inflammation in the body. Inflammation plays a major role in schizophrenia. In the survey questionnaire, the effects of all these supplements will be evaluated by the participating psychiatrists on a scale from zero to 10. The response will then be analysed. The mean, median, mode and standard deviation values will be calculated. The NPS of each element will also be calculated.

VI. THERAPEUTIC INTERVENTION

Cognitive behaviour therapy (CBT) is a therapeutic methodology to assist the patient to modify undesirable modes of thinking, feeling and behaviour. The use of CBT involves very effective self-help strategies, which are found to affect positive symptoms and changes in the patient's quality of life immediately. CBT is a short duration therapy which improves the quality of life for schizophrenia patients. Yoga sessions have been found to help reduce psychiatric symptoms and psychological distress and improve quality of life in schizophrenia. It is important to evaluate its effectiveness. Again some studies have found that Tai chi is effective for schizophrenia patient. Similarly, art therapy and music therapy are suggested to be beneficial for schizophrenia patients. In our survey, the importance of CBT, yoga, Tai chi, art therapy and music therapy will be evaluated in a scale of zero to 10 (zero being the least effective and 10 being the most effective). This survey will be done by clinical psychologists, care givers and case managers. From the survey responses, the mean, median, mode and standard deviation values will be calculated. Additionally, the NPS will be calculated for each type of therapy.

VII. PSYCHOSOCIAL FACTORS

Accommodation, education, job training, employment, relationship, friendship, exercise, overall well-being, smoking, substance abuse, suicide prevention, stigmatisation, recreation, entertainment, violent behaviour, arrangement of public trusteeship and guardianship, day-day-living skill, integration with community, overweight due to medications and other health complications related to medications are the other psychosocial factors whose importance also need to be evaluated. The non-pharmacological survey in this study will evaluate the importance of each of those factors on a scale from zero to 10 (zero being the least important and 10 being the most important). This survey will be done by clinical psychologists, care givers and case manager. From the survey responses, the mean, median, mode and standard deviation values will be calculated. Additionally, the NPS will be calculated for each of the factors.

TABLE I
OPTIONS AND SUPPORT MECHANISMS FOR HOLISTIC MANAGEMENT OF SCHIZOPHRENIA

Serial No	Symptoms/issues related to schizophrenia	Treatment / Support Options	References
1	Hallucination and delusions which cause inability to live independently	Antipsychotic drugs and complimentary intervention such as vitamin D or folic acid	[6], [11]
2	Withdrawal from social circle which affects friendship and relationship	Cognitive Behaviour Therapy (CBT)	[12], [13]
3	Disorganised behaviour which affects day-to-day life	CBT, yoga therapy, Antipsychotic medications and complimentary intervention such as vitamin D or folic acid	[14], [15]
4	Lack of sense of stability and security such as homelessness	CBT	[15]
5	Lack of self-support Group	CBT and yoga	[16]
6	Lack of coordination between various service providers	The case manager needs to cooperate and collaborate with various service providers and stakeholders who provide different kinds of support to the patient. The case manager will coordinate their services for effective support to the patient.	[17]
7	Lack of employment	CBT, yoga and antipsychotic and job training	[18]
8	Lack of education and training	CBT, yoga and antipsychotic drugs that improve cognitive impairment which helps education and training	[19], [20]
9	Poor relationships	CBT and antipsychotic drugs which improves cognitive impairment contributing to improved relationships	[21]
10	Lack of recreation and entertainment	CBT and yoga - CBT addresses the issue of cognitive dysfunction and yoga contributes to a sense of wellbeing that helps in recreation and entertainment	
11	Stigmatisation	CBT	[22]
12	Lack of public guardianship	CBT - in the absence of family support, public guardianship is very important that may be achieved by effective CBT.	-
13	Suicide prevention	CBT and antipsychotic drugs reduces suicidal ideations	[23]
14	Violent behaviour	CBT	[24]
15	Lack of exercise	CBT and yoga – they promote health consciousness	[6]
16	Lack of Integration with the community	CBT and Antipsychotic drugs	[25]
17	Lack of overall well being	Yoga	[26]
18	Lack of public management of finance	CBT - government trustees help to manage finance for the patient	--
19	Substance abuse	CBT and yoga	[27]

VIII. PHARMACOLOGICAL SURVEY QUESTIONNAIRE

The proposed questionnaire is described below:

- Country: Drop down country list
- Professional Experience: No. of years

For the following drugs, please assess their effectiveness for treatment of schizophrenia as well as their side effects on a scale of zero to 10 – zero having least effect and 10 having most effect.

- Generic name: aripiprazole class: atypical antipsychotics:

- Effectiveness in treating schizophrenia;
- Overweight due to medication;
- Effect on insulin resistance;
- Effect on sleep apnoea;
- Other harmful side effects.

- Generic name: risperidone class: atypical antipsychotics

- Effectiveness in treating schizophrenia;
- Overweight due to medication;
- Effect on insulin resistance;
- Effect on sleep apnoea;
- Other harmful side effects.

- Generic name: asenapine class: atypical antipsychotics

- Effectiveness in treating schizophrenia;
- Overweight due to medication;
- Effect on insulin resistance;
- Effect on sleep apnoea;
- Other harmful side effects:

- Generic name: quetiapine class: atypical antipsychotics

- Effectiveness in treating schizophrenia;

- Overweight due to medication;

- Effect on insulin resistance;

- Effect on sleep apnoea;

- Other harmful side effects.

- Generic name: clozapine class: atypical antipsychotics

- Effectiveness in treating schizophrenia;

- Overweight due to medication;

- Effect on insulin resistance;

- Effect on sleep apnoea;

- Other harmful side effects.

Please assess the effect of following complimentary medications in the treatment of schizophrenia on a scale of zero to 10 –zero being the least effective and 10 being the most effective:

- Vitamin B;

- Folic acid;

- Fish oil;

- Glycine;

- Vitamin C;

- Vitamin D;

- Vitamin E.

IX. NON-PHARMACOLOGICAL SURVEY QUESTIONNAIRE

The non-pharmacological survey questionnaire is described below:

- Country: Country drop down list

- Years of professional experience: No. of years

Please assess the following therapies in their effectiveness

for treatment of schizophrenia on a scale of zero to 10 – zero being least effective and 10 being most effective:

3. Cognitive Behaviour Therapy (CBT);
4. Yoga therapy;
5. Tai chi;
6. Art therapy;
7. Music therapy.

Please assess the importance of following factors in the overall management of schizophrenia on a scale of zero to 10 – zero being least important and 10 being most important:

8. Stable and suitable accommodation;
9. Provision of education for future career;
10. Availability of job training;
11. Availability of employment;
12. Provision of recreation;
13. Provision of entertainment;
14. Imparting day to day living skill;
15. Arrangement of independent living skill;
16. Facility for integration with community;
17. Arrangement for suicide prevention;
18. Imparting knowledge about controlling violent behaviour;
19. Imparting knowledge about bad consequences of smoking;
20. Arrangement of knowledge about substance abuse;
21. Arrangement of coordination between various service providers;
22. Arrangement of public guardianship;
23. Arrangement of public trusteeship;
24. Organising facility for physical exercise;
25. Arrangement for familiarity with issues of stigmatisation;
26. Arrangement of healthy relationship;
27. Arrangement of friendship;
28. Arrangement of sense of overall wellbeing;

X. SURVEY METHODOLOGY

The two surveys in this study will be online internet-based questionnaires. The survey will be done among professionals of English speaking countries, and is targeting mainly those such as Australia, New Zealand, UK, North America and Asia. The researchers plan to write to the professional associations of the respective countries to request their members to participate in the survey. Additionally, potential respondents will also be requested through the personal network of the researchers. Considering the professional population of Australia, New Zealand, North America, Asia and UK, the aim is a response rate of around 200. A sample size of 200 will be fairly significant for each type of survey. As the survey will be anonymous, the authors' do not foresee any ethical issue related to the survey. Potential respondents will be assessed in country specific manner as they reflect the viewpoint of the belonging country.

XI. RESULTS

After the survey responses are collected. The study will calculate mean, median, mode, standard deviation, NPS as well as to rank the survey responses in order of their statistical

significance.

Net Promoter Score (NPS): Net promoter score [28] is a significant element to capture practitioners experience and used widely in various industries. A brief description of the NPS is given here. The NPS depicts practitioners' experience, and is a proven metric that forms the core of experience programs the world over. For the questions asked, respondents rated their answers on a scale from zero to 10, where zero represents "least important" and 10 represents "highly important". Those who respond with scores of 9-10 are called "promoters", 7-8 are "passives" and 0-6 are "detractors". The NPS is determined by subtracting the percentage of detractors from promoters. Respondents are grouped as follows:

Promoters (score 9-10) are respondents who feel very strongly about the issue.

Passives (score 7-8) are satisfied but do not feel very strongly about the issue.

Detractors (score 0-6) are respondents who feel poorly about the issue.

Subtracting the percentage of the Detractors from that of the Promoters yields the NPS, which can range from a low of -100 (if every practitioner is a Detractor) to a high of 100 (if every practitioner is a Promoter).

NPS will signify the type of preferences of the various factors in the survey responses.

Ranking of the factors: In the pharmacological survey response analysis, based on their statistical significance, each drug will be ranked in order of their popularity for effectiveness in treatment of schizophrenia as well as their harmful side effects. This comparative study will highlight the efficacy of the chosen antipsychotic drugs in the treatment of schizophrenia symptoms. In the non-pharmacological survey response analysis, each therapy will be ranked in order of their preferences based on their statistical significance. This will signify the effectiveness of different therapies in the holistic management of schizophrenia in order of preference and effectiveness. Other psychosocial factors such as accommodation, education, job training will also be ranked in terms of their statistical significance. This will assist to allocate relative importance to the chosen factor in the holistic management of schizophrenia.

Analysis Scope: The above analyses will be done on a global basis as well as country specific basis to highlight the variation in survey responses from country to country.

XII. DISCUSSION

As previously described and explained, various factors are available to manage schizophrenia in a holistic manner. It may be mentioned that although there are widespread research and studies into pharmacological intervention, there are not many studies encompassing all the psychosocial factors associated with the holistic management of schizophrenia. Thus, this study has provided a framework for the holistic management of schizophrenia and formulated a mechanism to evaluate the comparative significance of each of these factors. Once the responses of these two surveys are received, the analyses, as described above, will be conducted. The results will assist to

allocate relative importance to the respective factors controlling the effective overall management of schizophrenia. This allocation of relative importance is vital for the effective management of schizophrenia. Thus, this study will contribute positively in the improvement of quality of life for schizophrenia sufferers.

REFERENCES

- [1] Shenton, E. M., Kikinis, R., Jolesz, A. F., Pollak, D. S., LeMay, Wible, G., Hokama, H., Martin, J., Metcalf, D., Coleman, M., McCarley, W. R., Abnormalities of the Left Temporal Lobe and Thought Disorder in Schizophrenia — A Quantitative Magnetic Resonance Imaging Study, *N Engl J Med*, 1992, 327,604-612.
- [2] American Psychiatric Association, Diagnostic and statistical manual of mental disorders (5th Ed.) 2013. Arlington, VA: American Psychiatric Publishing.
- [3] Mathers, C. D., Loncar, D., Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Medicine* 3, 2006: e442.
- [4] Simeone, J. C., Ward, A. J., Rotella, P., Collins, J., Windisch, R., An evaluation of variation in published estimates of schizophrenia prevalence from 1990 - 2013: A systematic literature review, *BMC Psychiatry*, 2015, 15: 193.
- [5] Kirkbride, J. B., Fearon, P., Morgan, C., Heterogeneity in incidence rates of schizophrenia and other psychotic syndromes: Findings from the 3-center AeSOP study, *Archives of General Psychiatry*, 2006, 63: 250–258.
- [6] Galletly, C., Castle, D., Dark, F., Humberstone, V., Jablensky, A., Killackey, A., Kulkarni, J., McGorry, P., Nielssen, O., Tran, N. Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines for the management of schizophrenia and related disorders; doi: 10.1177/0004867416641195 *Aust N Z J Psychiatry* May 2016 vol. 50 no. 5 410-472.
- [7] Aleman, A., Kahn, R. S., Seltén, J. P., Sex differences in the risk of schizophrenia: Evidence from meta-analysis, *Archives of General Psychiatry*, 2003, 60: 565–571.
- [8] McGrath, J. L., Saha, S., Chant, D., Welham, J. Schizophrenia: A concise overview of incidence, prevalence, and mortality, *Epidemiologic Reviews*, 2008, 30: 67–76.
- [9] Neil AL, Carr VJ, Mihalopoulos C, What difference a decade? The costs of psychosis in Australia in 2000 and 2010: Comparative results from the first and second Australian national surveys of psychosis., *Australian and New Zealand Journal of Psychiatry*, 2014, 48: 237–248.
- [10] Khandakera, M. G., Barnetta, H., Whitec, R. I., Jonesa, B. P., A quantitative meta-analysis of population-based studies of premorbid intelligence and schizophrenia, *Schizophrenia Research*; 2011, 132(2–3), 220–227.
- [11] Cieslak, Kristina, Jordyn, Feingold, Daniel, Antonius, Julie, Walsh-Messinger, Roberta, Draxler, Mary, Rosedale, Nicole, Aujero, David, Keefe, Deborah, Goetz, Raymond, Goetz, Dolores, Malaspina, Low Vitamin D levels predict clinical features of schizophrenia; *Schizophrenia Research*; November 2014, Volume 159, Issues 2-3, Pages 543–545.
- [12] Turkington, D., Kingdon, D., Weiden, P. J., Cognitive behavior therapy for schizophrenia. *Am J Psychiatry*, 2006;163:365–373.
- [13] Lewis, S., Tarrier, N., Haddock, G., Randomised controlled trial of cognitive-behavioural therapy in early schizophrenia: acute-phase outcomes, *British Journal of Psychiatry*, 2002, 181 (suppl. 43), s91–s97.
- [14] Teesson, M. L., Hodder, T., Buhrich, N., Psychiatric disorders in homeless men and women in inner Sydney. *Australian and New Zealand Journal of Psychiatry*, 2004, 38: 162–168.
- [15] Morrison, K. Ann; Cognitive Behavior Therapy for People with Schizophrenia; *Psychiatry (Edmont)*. 2009 Dec; 6(12): 32–39.
- [16] Gangadhar, N., Varambally, S., *Int J Yoga*. 2012 Jul-Dec; 5(2): 85–91.
- [17] Fontanella CA1, Guada J, Phillips G, Ranbom L, Fortney JC , Individual and contextual-level factors associated with continuity of care for adults with schizophrenia, *Adm Policy Ment Health*. 2014 Sep;41(5):572-87.
- [18] Kinoshita, Y., Furukawa, T. A., Kinoshita, K., Honyashiki, M., Omori, I. M., Marshall, M., Bond, G. R., Huxley, P., Amano, N., Kingdon, D., Supported employment for adults with severe mental illness, 2013, *The Cochrane Database of Systematic Reviews* 9: CD008297.
- [19] Drake, E. R., Bond, R. G., and Becker, R. D., Individual Placement and Support: An Evidence-Based Approach to Supported Employment, 2012, New York: Oxford University Press.
- [20] Lysaker PH, Davis LW, Bryson GJ, Bell MD. Effects of cognitive behavioral therapy on work outcomes in vocational rehabilitation for participants with schizophrenia spectrum disorders. *Schizo Res*. 2009;107:186–191.
- [21] Ramsay, C. E., Broussard, B., Goulding, S. M., Cristofaro, S., Hall, D., Kaslow, N. J., Killackey, E., Penn, D., Compton, M. T., Life and treatment goals of individuals hospitalized for first-episode nonaffective psychosis, *Psychiatry Research* , 2011,189: 344–348.
- [22] Koschorke M, Padmavati R, Kumar S, Cohen A, Weiss HA, Chatterjee S, Pereira J, Naik S, John S, Dabholkar H, Balaji M, Chavan A, Varghese M, Thara R, Patel V, Thornicroft G.; Experiences of stigma and discrimination faced by family caregivers of people with schizophrenia in India.; *Soc Sci Med*. 2017 Apr;178:66-77. doi: 10.1016/j.socscimed.2017.01.061. Epub 2017 Feb 1.
- [23] Mamo DC, Managing suicidality in schizophrenia. *Can J Psychiatry*. 2007;52(6):59S–70S.
- [24] Large M, Smith G, Nielssen O, The relationship between the rate of homicide by those with schizophrenia and the overall homicide rate: A systematic review and meta-analysis, *Schizophrenia Research*, 2009, 112: 123–129.
- [25] Eack SM, Mesholam-Gately RI, Greenwald DP, Negative symptom improvement during cognitive rehabilitation: Results from a 2-year trial of Cognitive Enhancement Therapy, *Psychiatry Research*, 2013, 209: 21–26.
- [26] Manjunath, R. B., Psychiatry, National Institute of Mental Health and Neurosciences; 2009. Efficacy of yoga therapy as an add-on treatment for in-patients and out-patients with functional psychotic disorder (Dissertation).
- [27] Moore, E., Mancuso, S. G., Slade, T. The impact of alcohol and illicit drugs on people with psychosis: The second Australian National Survey of Psychosis, *Australian and New Zealand Journal of Psychiatry*, 2012, 46: 864–878.
- [28] Reichheld FF, The one number you need to grow; *Harvard Business Review*. 2003 , Dec; 81(12):46-54, 124.