

Music Therapy and Polycystic Ovary Syndrome: A Position Paper

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ABSTRACT

Polycystic ovary syndrome (PCOS) is one of the growing disorders among women. The factors causing PCOS are majorly hormonal, and include genetic factors as well as the environmental factors. However, research is still on to understand the causes of PCOS completely. Polycystic ovary syndrome not only affects women physically but also psychologically and socially. All the symptoms are interconnected and hence affects a woman's overall health leading to a deteriorated quality of life. Treatments for PCOS often address the physical aspects of the syndrome, but not the psychological or social outcomes. A holistic outlook would perhaps work on creating an impact not only physically but also from the mind-body level. Music therapy (MT) is a treatment modality that has been found to work from all perspectives of physical, psychological, and social factors. The objective of this position paper is to understand the need and the effect of MT on women diagnosed with PCOS.

Keywords: Hormonal imbalance, Music, Music therapy, Polycystic ovary syndrome, Psychoimmunology, Social wellbeing, Stress.

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INTRODUCTION

According to the World Health Organization (WHO), "Health is said to be a state of complete mental, physical and social well-being and not just the absence of disease." In this context of health, PCOS affects women physically, mentally, and socially. Polycystic ovary syndrome is an endocrinological disorder that affects women, leading to physical symptoms,¹ such as enlarged ovaries, irregular menstrual cycles, pelvic pain, hirsutism, alopecia, acne, skin tags are among some that can be named.² Polycystic ovary syndrome has an effect causing psychological issues such as anxiety and depression that tag along with the physical symptoms.³ Apart from physical and psychological symptoms, it also affects the psychosocial health of a woman. For instance, adolescent girls feel "different" or "not normal" with irregular periods, obesity and acne that are not controllable by usual techniques. A girl feels the need to "stay home and hide," as it negatively affects their perception of attractiveness or ability to make social contacts.⁴ This state of isolation and loneliness adds to the stress factor on them.⁵ The major causes of PCOS also include factors related to genetics, stress, or the environment.⁶

Considering the presence of PCOS, one in five women is affected by PCOS. The data reflects that globally 6–26% of women are affected by PCOS, whereas the percentage is in the range 3.7–22.5% in India while the percentage of young adolescent girls with PCOS is 9.13% in India.⁷

Music is ingrained in our lives as fundamental as understanding that even the heartbeat is rhythmic, which can be connected to what is termed as circadian rhythms. Most of us take recourse to music in our everyday life in different forms, singing, listening, playing musical instruments, etc. Music has the power to influence our mood and is an essential part of many events throughout our lives. There are numerous references of therapeutic elements of music in the Indian ancient scriptures as well as ancient history all over the globe and can be said to have the ability to create a therapeutic value in our lives.⁸

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However, scientific research evidence-based practice have taken place only in the last century.⁹ According to Kenneth Bruscia, "MT, is a systematic process of intervention wherein the therapist helps the client to promote health, using music experiences and the relationships that develop through them as dynamic forces of change."¹⁰ Music therapy is widely utilized as an adjunct treatment and as a part of assistance in various diseases and has also found its place as primary care in certain areas. A large body of literature explains how MT has been useful in enhancing psychological, physical, cognitive, or social functioning.¹¹ Various methods and techniques are involved in the process of MT intervention such singing, writing music, performing music, listening to music, and lyric analysis, among other techniques.¹² Overall, it can be said that MT works on the mind-body level.¹³

From the previous data, we know that PCOS can affect the overall health and wellbeing of women in all aspects and considering the fact that there is evidence of positive impact using MT on the physical, physiological, psychological, and social functioning, the objective of this position paper is to understand the effect of MT on women with PCOS.

MATERIALS AND METHODS

This is a narrative review of effect of music and MT in women diagnosed with PCOS. The authors reviewed articles from online

journals in the last 20 years. There criteria for the literature review were any type of music and/of MT approaches used with PCOS clients. For the purpose of this review, the articles reviewed were in English and the search names as search criteria included PCOS, music, MT and PCOS, polycystic ovary syndrome, music in PCOS, etc. The articles reviewed were from online search engines ResearchGate, PubMed, MEDLINE, PsycINFO, and Google Scholar.

LITERATURE REVIEW

Polycystic ovary syndrome has been defined as a complex condition in which the androgen levels are increased, menstrual irregularities, and/or small cysts are found on one or both ovaries.¹⁴

Polycystic ovary syndrome displays a spectrum of symptoms. The most common symptom being the disturbance in/or irregular menstrual cycle either in the form of oligomenorrhea, which means irregular and inconsistent menstrual blood flow in a woman,¹⁵ or amenorrhea which means absence of menstruation during the reproductive age of a woman.¹⁶ Infertility is one of the major problems found, as cysts are formed in the ovaries.¹⁷ Many women complain of having abdominal pain, although the time of occurrence is not determined. Additionally, insulin resistance is also a symptom in case of PCOS.¹⁸ In PCOS, there is a high glucose level in the body. Insulin is produced with the increased glucose levels in the blood, through the pancreas. When we eat, carbohydrate is broken down into glucose and passed to the bloodstream, insulin helps the glucose to be taken in by the different parts of the body, which is then used for energy. However, when there is insulin resistance, the body does not respond to insulin appropriately, which causes high glucose levels and less energy in the body. With time, the body needs more insulin to factorize glucose.²

There are some symptoms which are visible on the physical level such as hirsutism, where there is excessive or unusual hair growth in different parts of the body and obesity which is found to be infrequent, although not mandatory for all women.¹⁹

It has been documented from research that women with PCOS have greater body dissatisfaction than healthy women with regular cycles, even after adjustment for body mass index.²⁰ As the standards of beauty depend on societal ideals and sociocultural aspects women suffering from PCOS often worry about going out and socializing. The perception of body image is also said to be negative among women with PCOS which include dissatisfaction with appearance, perceived loss of feeling of femininity as well as reduced attractiveness, and constantly being self-conscious about their appearance.²¹

Body dissatisfaction increases a factor of stress that can be a cause for development of eating disorders as it can be explained in a simple manner, when a person is stressed or sad, eating may calm or make her feel better, eventually leading to excessive eating and consequently to weight gain making this a chain affecting the sociological health of the person.²² It was also found that adolescent girls with PCOS consumed a smaller amount of healthy food, have less physical activity, and even skipped meals which adds to the lifestyle factors making a noticeable effect; hence, overeating as well as under eating both can be detrimental to the body.²³ In one of the interesting studies based on teens and women with PCOS it was mentioned that women's primary motivation to lose weight and manage PCOS symptoms was to increase their likelihood of pregnancy and form a family.²⁴

One of the various factors that cause PCOS is "genetics." It is observed that some of the genes have reflected genetic abnormality in PCOS effects which cause the symptoms of PCOS.²⁵ Although the standard model of genetic factors has not yet been defined, many researchers call it a polygenic pathology, which involves multiple genes. It is also possible that a particular gene in a given family may have a dominant effect.²⁶ The available studies suggest that there is a strong familial factor to PCOS.²⁷ Sisters of women with PCOS have 40–50% chance of getting PCOS.²⁸ This gives us a good view as to how stress can play an important component and also a cause of aggravating the symptoms of PCOS.

Stress can have short-term as well as long-term effects that may impact reproductive, metabolic, and psychological health, consequently leading to chronic illnesses.²⁹ A classic example of that can be taken to be depression which is very common in people with diabetes in comparison with healthy individuals.²² One may also mention hypertension as a common symptom among women affected by this disorder. In one study, women with PCOS were 40% more likely to have elevated blood pressure than the non-PCOS women.³⁰

Stress-related anovulation leads to infertility which has been found in many reports that speak about the role of stress in PCOS.³¹ Cortisol is said to be one of the main biomarkers for stress-related changes in the body. A cross-sectional case-controlled study from North India reflected that women with PCOS had an increased prevalence of anxiety and depression, in comparison to the controlled group, PCOS participants had a moderate-to-severe level of anxiety as well as depression.³² In another study on the perception of stress on PCOS, it was found that women tend to have more issues of depression, anxiety, obesity, and cardiovascular diseases. The study also found that women with PCOS have more waist-to-hip ratio, dyslipidemia, and fasting sugar as compared to women without PCOS.³³ From this observation of symptoms, it can be said that stress can also lead to physical symptoms and further illnesses.

The environmental factors are associated with the way we lead our lives and it also includes the surrounding we live in. The factors such as lifestyle and occupational, and the environmental factors related to air quality, may be responsible for the adverse consequences affecting the person's reproductive and overall health, which explains that the environment that we live in play a significant role in keeping a person healthy.⁶ A study done in Western Australia suggested that the high rate of PCOS in aboriginal women is associated with cultural and lifestyle changes in aboriginal communities resulting from colonization.

Work stress can also be added to the causes of PCOS, and it was mentioned under the heading of *Atichinta* (stress).³⁴ With the changing environment and survival needs, occupationally, we tend to overwork causing work–life imbalance, which adversely has an effect on the symptoms of PCOS.

In one of the first studies conducted in air quality in relation to the risk of PCOS, it reflected that air pollution can cause higher androgen release, which can further cause the development of PCOS and also increase in such situations where women have PCOS.³⁵

Hence, PCOS ultimately leads to reduction in the quality of life as it affects the physical and physiological symptoms, and causes psychological issues such as depression, anxiety, and mood disorders and also suicidal thoughts as an extreme symptom in many patients.³⁶

The treatment of PCOS consists of some common treatments such as hormonal contraceptives, progestins, and metformin. The physical symptoms are controlled by drugs and antiandrogen medicines.³⁷ It has been documented that some drugs used in the treatment of PCOS also have unfavorable effects on the symptoms. The choice of medication has to be very selective and symptoms based.³⁸

Music and its elements have been found to have a great impact on our body, mind, and soul. Keeping this in mind there is a large body of literature available that shows effects of music as having therapeutic effects on the human body and psychological aspects as well.³⁹ Music therapy and music medicine are two major areas that research and practice have taken place to create evidence of its effects on the physical, psychological, social, and spiritual wellbeing in people.

Currently, MT is found to be widely applied in areas of healthcare and rehabilitation. The major referral areas for MT have been in healthcare systems or hospitals, neurological rehabilitation, pain management, and psychological problems—to name a few.

Music Therapy on Physical Factors and Vital Signs

Listening to music can change the state of the autonomic nervous system, such as heart rate, body temperature, respiration rates, etc.⁴⁰ Music therapy was found to lower the pain score of a patient who received standard palliative care.⁴¹ The use of music helps to stabilize blood pressure, promote sleep, and reduce pain.⁴² A study revealed a downward trend in blood pressure with hypertensive patients who received MT interventions.⁴³

Music therapy can be used to improve the physical ability of people who face issues with fine and gross motor skills. Techniques have been developed in MT to help in improving joint and muscle function, and/or to increase fine and gross motor coordination and control as well as an increase in range of motion.⁴⁴

There is a study of MT for multiple sclerosis patients⁴⁵ that demonstrated patients' improvements in the physical symptoms as well as self-acceptance, anxiety, and depression thereby connecting to the mind–body theory.

Use of MT has been extended to pulmonary diseases, and studies have found to reduce the symptom of breathlessness, shortness of breath, and stress.⁴⁶ Singing requires great control to ensure a smooth and sustained exhalation and this exhalation is similar to that of a pursed lip breathing that is also a controlled function, which helps to improve breathing and lung power in people with COPD.⁴⁷

Music and Mental Health

Under the mental health issues, there are two branches – psychiatric disorders and psychological issues. Psychiatry is the branch of medicine that deals with causation, prevention, diagnosis, and treatment of mental health and behavioral disorders. Psychiatry is practiced by medical doctors specialized in mental illness. They have a medical approach to disorders and trained in using medicines.⁴⁸ Few examples of psychiatric disorders are depression, schizophrenia, delusional disorders, obsessive compulsive disorder, etc.⁴⁹

Whereas psychological disorder is a condition characterized by abnormal thoughts, feelings and behavior, thoughts, and inner experiences that are atypical, distressful, dysfunctional, and sometimes even dangerous, as signs of a disorder.⁵⁰

Music has numerous applications within a psychiatric setting where the brain, mind, and music are interconnected and can have

an impact on psychiatric disorders. Three studies were conducted in the Central Institute of Psychiatry, Ranchi, Jharkhand, India, on schizophrenia and impact of MT that found the experiment group showed lowered thought disturbance, depression, and percentage of disability.⁵¹

Melody and rhythm perception, and musical memory, are known to anticipate verbal working memory, verbal memory, and facial emotion recognition in patients with schizophrenia.⁵²

In a 2007 study by Ulrich, he studied 37 patients with psychotic disorders, the experimental group had undergone MT, along with their primary treatment. The significant effects of MT were found regarding their psychosocial orientation and negative symptoms.⁵³

In a review found in Cochrane Library, it was suggested that in addition to standard treatment, MT can improve global state, mental state (including negative and general symptoms), social functioning, and quality of life of people with schizophrenia or schizophrenia-like disorders.⁵⁴

A majority of articles found that MT was helpful for them as a supplement to the main treatment, and it also showed in some studies that MT was effective in escalating the quality of life. Music therapy interventions have an impact in reducing anxiety, sadness, anger, and stress.⁵⁵ Music therapy was observed to be effective in cancer patients with acute depression.⁵⁶

In a study of 50 hospitalized cancer patients, half of the randomly assigned participants were given live instrumental music and the other half used the recording of the therapist singing along with her guitar as a part of individual session of MT. The profile of mood states was used to observe effects before and after MT sessions and the study recorded that the patients who received live music reported decreased tension and anxiety.⁵⁷

Music was used as therapy to see its effects on mood stabilization in a particular study and music techniques were inculcated in the following two ways: (i) Music that differs from current mood and (ii) Music that mirrored the current mood. The young adults in the study had a tendency to depression and post intervention, it was found that level of awareness due to their choice of music and listening to it affects their mood positively. The participants were aware of it.⁵⁸ The symptoms in patients with state of anxiety and heart rate had lessened after taking meditative music listening sessions in a study.⁵⁹

Music and Psychoimmunology

Psychoimmunology is a study of brain, behavior, and immune system of our body. There are studies which state that females develop more capacity to produce antibodies.⁶⁰ Apart from all the factors, sex hormones in both males and females can also control the immune response. Many hormones such as cortisol can regulate the testosterone cells in our body.⁶¹

For a longer period, music has been used as a tool to reduce stress and calming.⁶² Music makes its impact on the mind primarily, which is the center of our body, that again is connected to various other parts of our body. It is recognized that there is an effect of music on the immune system and the overall health system.

In a research work in regard to the assessment of cortisol levels during colonoscopy, it was found that the level of cortisol did not increase much in the population which was given MT.⁶³ So, it reflects that stress in a given condition can be controlled through MT. In a 2017 study, observing the changes in oxytocin and cortisol levels, it was suggested that listening to slow-tempo and

fast-tempo music reflects an increase in the oxytocin level and a decrease in the cortisol level, respectively, and such changes lead to physiological relaxation and emotional excitation.⁶⁴

In a research work carried out by Fukui et al., it was suggested that estradiol and testosterone secretion had increased after giving MT, the context was related to Alzheimer's disease.⁶⁵

Music and PCOS

Polycystic ovary syndrome has an overall health effect on women, which makes it necessary to understand the need to address these issues from its early onset. Even though, so far, there are not many studies which discuss about MT and PCOS, the existing research is very interesting and significant in nature.

Stress can cause increased levels of cortisol hormone, due to which androgen level also rises, and because of this, the PCOS symptoms can escalate.³¹ In one of the studies, it was found that listening to music can control the cortisol levels and provides light sedation.⁶⁶

Further studies to understand if reducing cortisol may help in reducing the androgen hormonal secretion in women with PCOS may be a way of understanding the effect of music in the immunology of the human body.

In a single case qualitative research, the objective was to determine the creativity levels in young adults having sexual under-achievement due to the clinical condition of PCOS. Various active techniques of MT were used, such as drumming, singing, and music listening. It was stated that the musical stimulation alters the mind of the subject in a positive direction. From the results of the study, it could be understood that music listening produces body movements which helps to develop mature sexual gestures, activities related to music helps in social actions, use of music can promote sexual development for sexual maturity irrespective of chronological age.⁶⁷

Specifically in one of the cross-sectional studies, it was found that there is a significant relationship between age, prayers, and listening to music among PCOS women. Even though there were multiple techniques such as prayers, religious deeds, crying, yoga, fighting were used, listening to music had a significant and noticeable impact on the PCOS participants.⁶⁸

LIMITATIONS

It is possible with the available literature to understand how music has a positive effect on women suffering from PCOS. However, there are limitations starting with a major problem whereby treatment is not being given at the right time. One of the main reasons is that most women are not diagnosed early on in their life which could help with treating them before getting to a stage of infertility which is when most of the diagnosis starts to happen. Polycystic ovary syndrome is a lifestyle disorder, which requires patience, so does the MT. Hence it might be difficult to hold the attention and trust of the participant about the impacts of MT. This will certainly require long-term follow-ups.

That leads us to answer why we have very few studies using MT with this population. Understanding a framework within which techniques and methodologies of MT can be used is yet a question that can be answered with more research and consistent practice of MT in PCOS patients. Consistency is one of the major factors associated with PCOS as it is related to long-term effects of hormonal imbalance.

CONCLUSION

Polycystic ovary syndrome is a state that usually does not require admission to medical facilities, and from the review it can be understood it would be beneficial for women with PCOS to understand the importance of MT. Also, as a matter of fact, physicians could be the point of first contact from whom the clients are motivated to take up alternate and complementary therapies like MT which may help increase the chances of women taking this treatment modality more seriously. In view of the studies, we have come across, the major technique used has been receptive music. Further research using various other methods and techniques as well as processes of MT can prove to be useful to understand the impact of MT in women diagnosed PCOS.

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