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The Effect of Yoga on the Quality of Life in the Children and Adolescents with Haemophilia

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Received: 5 November 2014 Revised: 17 January 2015 Accepted: 20 January 2015

ABSTRACT
The problems caused by haemophilia lead to impairments of the quality of life in patients with haemophilia. This study aimed to investigate the effects of yoga on quality of life in the children and adolescents with haemophilia in Shiraz, Iran. This semi-experimental study with pre- and post-test design was performed on 27 boys between 8 and 16 years old who suffered from haemophilia. The patients were divided into two groups. The number of bleedings, absences from school, and referrals to the clinic was evaluated. The demographic data were collected through interviews and using the patients’ records in the haemophilia center. Besides, the quality of life was assessed through the Haemo-QoL questionnaire. Then, the yoga intervention was performed for 14 weeks and the data were collected in three stages. The collected data were entered into the SPSS statistical software, version 18 and were analyzed using non-parametric Friedman test. After the intervention, significant differences were observed in the mean scores of quality of life dimensions and the number of bleedings, school absences, and referrals to the haemophilia clinic (P<0.001). Thus, yoga may improve the haemophilia children’s and adolescents’ perception of quality of life without the risk of injury. This intervention also seemed to be effective in reducing the number of bleedings, referrals to the haemophilia clinic, and absences from school.

KEYWORDS: Quality of life, Haemophilia, Children, Adolescents, Yoga

Please cite this article as: Beheshtipoor N, Bagheri Sh, Hashemi F, Zare N, Karimi M. The Effect of Yoga on the Quality of Life in the Children and Adolescents with Haemophilia. IJCBNM. 2015;3(2):150-155.
**INTRODUCTION**

Haemophilia is characterized by recurrent bleedings and its complications lead to impairment of the overall Quality Of Life (QOL). Individuals with haemophilia are now strongly advised to perform physical activities to improve their physical and mental well-being, particularly in developing countries where factor replacement therapy is limited. Yoga can play an important role in improvement of QOL in the individuals suffering from chronic diseases.

It should be noted that in Iran, as in most developing countries, access to factor replacement therapy is limited and most patients are treated with on-demand therapy. Thus, the present study aims to investigate the effect of a 14-week yoga intervention on the life quality of the children and adolescents with haemophilia. The number of bleedings, absences from school, and referrals to the clinic was assessed, as well.

**MATERIALS AND METHODS**

This study was conducted on all the 27 available boys between 8 and 16 years old with haemophilia who had referred to the haemophilia clinic at the children’s hospital in Shiraz, the only haemophilia center in Fars province, southern Iran. Due to the small number of patients and ethical considerations, this study was performed semi-experimentally with pre- and post-test design and the samples were selected through census. The inclusion criteria of the study were having the ability to read and speak Persian, having no prior experiences of yoga, and being able and willing to participate in yoga practice. Written informed consents were obtained from all the children and their parents before the study. This study was approved by the Institutional Human Ethics Committee at Shiraz University of Medical Sciences, Shiraz, Iran.

The intervention was performed for 14 consecutive weeks and consisted of 8 weeks of class attendance (1 h a day, 2 days a week) and 6 weeks of home exercise (1 h a day, 2 days a week). A yoga instructor was trained about the haemophilic children in the haemophilia center. The exercises were selected by consultation with a sports medicine specialist in the haemophilia clinic and a specialist in Yoga Sciences. They were also adopted from the yoga videos from the Haemophilia Foundation Australia. The investigator was present in all the yoga classes throughout the 8 weeks in order to monitor the procedure. The yoga classes included warm-up practices, physical postures (asana), a simple practice of controlled breathing (pranayama), and relaxation. After 8 weeks of class attendance, the children were given the yoga video CDs to be able to perform their home exercises for 6 weeks. The participants were reminded and monitored regarding practicing the
exercises at home through telephone calls by the yoga instructor and the investigator. None of the children reported any adverse effects regarding the program. The assessments were performed at baseline as well as at the end of the 8th and 14th weeks of the intervention. The data were entered into the SPSS statistical software (version 18) and were analyzed using non-parametric Friedman test. Besides, P<0.05 was considered as statically significant.

RESULTS

All the 27 boys who met the inclusion criteria were recruited into the study and none was dropped out. Among the study patients, 16 and 11 boys were in the 8-12 and 13-16 years age groups, respectively. Besides, their mean age was 11.5 years (SD=3.9). The descriptive statistics of the study participants have been presented in Table 1.

QOL and its dimensions in age groups II and III have been shown in Table 2. Accordingly, the results of Friedman test indicated a significant difference in QOL before the intervention and 8 and 14 weeks after that (X²=50.29, P<0.001). Also, the results showed a significant reduction in the mean number of bleeding events (X²=44.07, P<0.001), referrals to the haemophilia clinic (X²=18.28, P<0.001), and school absences (X²=40.13, P<0.001) throughout the assessment stages.

DISCUSSION

This study is one of the first researches to support yoga as an intervention to improve the QOL of the children and adolescents with haemophilia. The improvement in QOL demonstrated in our study is consistent with the results of the studies performed on other chronic diseases. For instance, Selvaduria et al. showed the positive effects of an exercise intervention on QOL in the children with cystic fibrosis.9 Lundgren et al. also suggested that yoga increased QOL in the patients with epilepsy.4

In the present study, yoga improved the physical, psychological, and social domains of the haemophilic children’s life. Similarly, in a study by Kuttner et al., children with irritable bowel syndrome exhibited less functional disability, improved acceptance of health, and decreased anxiety following yoga.10 Overall, studies have revealed yoga to be effective in improving the physical function, psychosocial impairment, and behavior in both children and adolescents.11 Decrease in the frequency of bleeding episodes is noteworthy because it, in itself, has been associated with promotion of QOL in haemophilic patients.12 Reduction of bleeding frequency in our study is consistent with the results of the study by Tiktinsky et al.13 In that study, this decrease was explained by increase in strength of the muscles around the involved joints. In general, the patients with haemophilia are more vulnerable to stressful conditions which results in creation of new bleeding episodes.14 Therefore, increasing resilience to stressful situations can be an important way to reduce the number of bleedings. Parshad15 found that yoga helped individuals to become more resilient to stressful conditions. In our study, referrals to the haemophilia clinic and school absences were decreased, too. Brown et al.12 found that the frequency of bleeding episodes was negatively associated with QOL. Yoga,

| Table 1: Type and severity of haemophilia based on the patients’ age groups |
|---------------------------------------------------------------|
| **Haemophilia severity**                                      |
| **Total** | **Age group II (8–12 years old)** | **Age group III (13–16 years old)** |
|           | Mild | Moderate | Severe | Mild | Moderate | Severe |
| Haemophilia A | 23   | 5        | 2      | 6    | 4        | 2      |
| Haemophilia B | 4    | 2        | 1      | -    | -        | -      |
| Total       | 27   | 7        | 3      | 6    | 4        | 2      | 5       |
Effect of yoga on quality of life in pediatric haemophilia

Thus, may represent a particularly promising approach for improving the lifestyle of the children with haemophilia.

Despite the promising results, our study had some limitations, including the small sample size and lack of a control group. Moreover, the short study period limited the possibility to completely evaluate the maintenance of the improved QOL. Thus, a controlled study is required to be performed on a larger sample size in order to confirm the suggested benefits of yoga in haemophilia.

### Table 2: Comparison of changes in the mean values of Haemo-QoL dimensions in the two age groups and the entire sample before and at the 8th and the 14th week after the yoga intervention (Friedman test)

| Haemo-QoL | Age group II (8–12 years old) | Age group III (13–16 years old) | All n=27 |
|-----------|-------------------------------|---------------------------------|---------|
|           | n=16                          | n=11                            |         |
| Physical  |                               |                                 |         |
| Pre       | 59.8±12.5                     | 64.3±10.0                       | 61.6±11.5 |
| Week 8    | 47.8±11.5                     | 50.6±8.6                        | 48.9±10.3 |
| Week 14   | 44±9.7                        | 46.4±6.2                        | 45±8.4  |
| Feeling   |                               |                                 |         |
| Pre       | 56.9±18.1                     | 66.8±12                        | 60.9±16.4 |
| Week 8    | 46.2±17.5                     | 55.7±11.3                      | 50.1±15.7 |
| Week 14   | 43.1±16                       | 49.1±10.3                      | 45.5±14.1 |
| View      |                               |                                 |         |
| Pre       | 41.0±13.8                     | 57.0±16.5                      | 47.5±16.7 |
| Week 8    | 33.0±11.7                     | 45.7±11.4                      | 38.2±13.1 |
| Week 14   | 30.8±11.3                     | 41.4±10.1                      | 35.1±11.8 |
| Family    |                               |                                 |         |
| Pre       | 62.2±12.2                     | 65.6±9.1                       | 63.6±11.0 |
| Week 8    | 52.8±9.1                      | 57.7±11.4                      | 54.8±10.2 |
| Week 14   | 50.3±6.7                      | 57.1±11.5                      | 53.1±9.4  |
| Friends   |                               |                                 |         |
| Pre       | 72.3±20.2                     | 61.9±9.5                       | 68.1±17.2 |
| Week 8    | 57.4±14.1                     | 47.2±8.6                       | 55.2±13.0 |
| Week 14   | 53.9±11.8                     | 46.6±9.8                       | 50.9±11.4 |
| Perceived |                               |                                 |         |
| support   | Pre                           | 61.7±16.1                      | 66.0±16.1 |
|           | Week 8                        | 52.1±14.3                      | 54.9±13.6 |
|           | Week 14                       | 47.3±13.3                      | 49.8±11.9 |
| Others    | Pre                           | 32.3±10.9                      | 36.9±12.6 |
|           | Week 8                        | 25.3±10.7                      | 29.5±11.9 |
|           | Week 14                       | 24.5±8.2                       | 27.3±9.9  |
| School    | Pre                           | 52.3±13.6                      | 57.3±13.0 |
| and      | Week 8                        | 41.8±10.5                      | 44.6±10.1 |
| sport     | Week 14                       | 39.5±9.5                       | 41.0±8.9  |
| Dealing   | Pre                           | 40.2±16.5                      | 37.3±13.5 |
| with      | Week 8                        | 30.1±12.2                      | 26.7±10.4 |
| haemophilia| Week 14                       | 25.4±11.2                      | 23.1±9.5  |
| Treatment | Pre                           | 50.6±11.7                      | 49.3±10.6 |
|           | Week 8                        | 39.3±14.5                      | 38.7±13.0 |
|           | Week 14                       | 36.8±12.2                      | 35.7±10.3 |
| Future    | Pre                           | -                              | 48.3±10.9 |
|           | Week 8                        | -                              | 38.6±15.3 |
|           | Week 14                       | -                              | 35.2±11.6 |
| Relationship| Pre                          | -                              | 44.3±12.9 |
|           | Week 8                        | -                              | 34.0±12.6 |
|           | Week 14                       | -                              | 33.0±11.6 |
| Total Haemo-QoL | Pre | 53.0±8.7 | 55.6±4.6 | 54.1±7.3 |
|           | Week 8                        | 42.3±6.1                       | 43.0±5.3  |
|           | Week 14                       | 39.5±5.9                       | 40.1±4.8  |

IJCBNM January 2015; Vol 3, No 2
patients. Besides, semi-experimental studies including control groups are needed to be conducted in future in order to come to more reliable conclusions.

**Conclusion**

The present study supported the probable effectiveness of yoga not only in increasing the QOL, but also in decreasing the frequency of the bleeding episodes, referrals to the clinic, and absences from school in the haemophilia patients. Although all the study patients were being treated by on-demand therapy, no complications of yoga were reported, indicating that yoga is equally safe for the patients with haemophilia. Thus, the importance of yoga should be taught to the young haemophilies, especially in the countries where there is limited access to clotting factors.

**Acknowledgement**

Hereby, the authors would like to thank all the children, adolescents, and their families who participated in this study as well as the staff of Dastgheib Hospital and Haemophilia Clinic for their support. Thanks also go to Farshad Nazar Aghae (PhD in Yoga Sciences) and Vahid Mojab (sports medicine specialist) for their cooperation in this study. They would also like to thank Professor Von Mackensen for sending the original Haemo-QoL questionnaire and Gavin Finkelstein (representative of the HFA Executive Board on the Youth Committee) for sending the HFA educational yoga DVD to us. Ms. A. Keivanshekouh at the Research Improvement Center of Shiraz University of Medical Sciences is also appreciated for improving the use of English in the manuscript. This study was financially supported by Shiraz University of Medical Sciences. The research reported in this article was done in fulfillment of the requirements for M.Sc. degree in paediatric nursing awarded to Shahpar Bagheri (Proposal No. 89-5525).

**Conflict of Interest:** None declared.

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- عضویت در خبرنامه
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