

ISSN: 2158-284X

Volume 8, Number 4, April 2017



International Journal of Clinical Medicine



ISSN : 2158-284X



www.scirp.org/journal/ijcm

Journal Editorial Board

ISSN: 2158-284X (Print) ISSN: 2158-2882 (Online)

<http://www.scirp.org/journal/ijcm>

Editor-in-Chief

Prof. Yong Sang Song Seoul National University, South Korea

Managing Executive Editor

Prof. Junming Liao Tulane University, USA

Editorial Board

Dr. Marc Afilalo McGill University, Canada
Prof. Sergio D. Bergese The Ohio State University Medical Center, USA
Prof. Siamak Bidel University of Helsinki, Finland
Prof. Trond Buanes University of Oslo, Norway
Prof. Long-Sheng Chang The Ohio State University, USA
Prof. Alex F. Chen University of Pittsburgh School of Medicine, USA
Dr. David Cheng University Hospital Case Medical Center, USA
Prof. Yunfeng Cui Tianjin Medical University, China
Prof. Noriyasu Fukushima International University of Health and Welfare, Japan
Prof. Jeffrey L. Geller University of Massachusetts Medical School, USA
Prof. Kuruvilla George Peter James Centre, Australia
Prof. Karen Goodman Montclair State University, USA
Dr. Ramakrishnan Gopalakrishnan University of Southern California, USA
Prof. Gerard A. Hutchinson University of the West Indies, Trinidad-and-Tobago
Prof. Bharat K. Kantharia The University of Texas Health Science Center, USA
Prof. Shinya Kimura Saga University, Japan
Dr. Valery Leytin University of Toronto, Canada
Dr. Shaogang Ma Huai'an Hospital Affiliated to Xuzhou Medical College, China
Dr. Lawrence A. Mark Indiana University, USA
Dr. Edward P. Monico Yale University, USA
Prof. Krzysztof Roszkowski The F. Lukaszczyk Oncology Center, Poland
Prof. Raul R. Silva New York University, USA
Dr. Ron G. Stout Middle Tennessee Mental Health Institute, USA
Prof. Zheng Su Genentech Inc., USA
Prof. Joris Cornelis Verster Utrecht University, The Netherlands
Dr. Jue Wang University of Nebraska, USA
Dr. Li Xu Northwestern University, USA

Table of Contents

Volume 8 Number 4

April 2017

A Randomised Controlled Study to Investigate Effects of Bobath Based Trunk Control Training on Motor Function of Children with Spastic Bilateral Cerebral Palsy	
G. Arı, M. K. Günel.....	205
Self-Reported Experiences, Attitudes and Expectations of Infant Contacts in Medical Students; A Cross-Sectional Study in Ten Years' Interval	
A. M. Valkama, M. Mäkelä, J. Salo, M. Ojaniemi.....	216
Ultrasound-Guided Infraclavicular Axillary Vein Cannulation	
M. A. García-Díaz, M. Ruiz-Castro.....	227
Treatment of Asthma in the Elderly: Questionnaire Survey in Japan	
S. Chiba, K. Tsuchiya, T. Ogata, R. Imase, T. Yagi, Y. Mishima, T. Jinta, K. Saito, R. Taki, S. Isogai, Y. Jinn, T. Kawasaki, I. Natsume, Y. Miyashita, J. Takagiwa, N. Ishiwata, T. Chiaki, M. Kishi, Y. Tsukada, M. Yamasaki, N. Inase.....	236
Causes of Hospital Readmissions at the Community Level	
R. Lagoe, B. Drapola, D. Nanno, S. Littau.....	248
Comparison of Sensory Processing and Semantic Differentiation in Peoples with Schizophrenia, Multiple Sclerosis and Alzheimer's Disease	
J. S. A. Bijaeyeh, H. G. Givi, A. Sheykhosslami.....	257
Determining the Effectiveness of Cognitive Therapy on Mindfulness-Based in Marital Fatigue and Women Intimacy	
M. Mosalla, S. A. Aleyasin.....	265
Investigating the Effectiveness of Dialectical Behavior Therapy in Clinical Symptoms, Anger Control and Emotional Regulation of Bully Children	
F. P. Ziraki, T. Hassan.....	277

International Journal of Clinical Medicine (IJCM)

Journal Information

SUBSCRIPTIONS

The *International Journal of Clinical Medicine* (Online at Scientific Research Publishing, www.SciRP.org) is published monthly by Scientific Research Publishing, Inc., USA.

Subscription rates:

Print: \$79 per issue.

To subscribe, please contact Journals Subscriptions Department, E-mail: sub@scirp.org

SERVICES

Advertisements

Advertisement Sales Department, E-mail: service@scirp.org

Reprints (minimum quantity 100 copies)

Reprints Co-ordinator, Scientific Research Publishing, Inc., USA.

E-mail: sub@scirp.org

COPYRIGHT

Copyright and reuse rights for the front matter of the journal:

Copyright © 2017 by Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY).

<http://creativecommons.org/licenses/by/4.0/>

Copyright for individual papers of the journal:

Copyright © 2017 by author(s) and Scientific Research Publishing Inc.

Reuse rights for individual papers:

Note: At SCIRP authors can choose between CC BY and CC BY-NC. Please consult each paper for its reuse rights.

Disclaimer of liability

Statements and opinions expressed in the articles and communications are those of the individual contributors and not the statements and opinion of Scientific Research Publishing, Inc. We assume no responsibility or liability for any damage or injury to persons or property arising out of the use of any materials, instructions, methods or ideas contained herein. We expressly disclaim any implied warranties of merchantability or fitness for a particular purpose. If expert assistance is required, the services of a competent professional person should be sought.

PRODUCTION INFORMATION

For manuscripts that have been accepted for publication, please contact:

E-mail: ijcm@scirp.org

A Randomised Controlled Study to Investigate Effects of Bobath Based Trunk Control Training on Motor Function of Children with Spastic Bilateral Cerebral Palsy

Gonca Arı, Mintaze Kerem Günel*

Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Hacettepe University, Ankara, Turkey

Email: *mintaze@hacettepe.edu.tr

How to cite this paper: Arı, G. and Günel, M.K. (2017) A Randomised Controlled Study to Investigate Effects of Bobath Based Trunk Control Training on Motor Function of Children with Spastic Bilateral Cerebral Palsy. *International Journal of Clinical Medicine*, 8, 205-215.

<https://doi.org/10.4236/ijcm.2017.84020>

Received: March 20, 2017

Accepted: April 25, 2017

Published: April 28, 2017

Copyright © 2017 by authors and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Purpose: The aim of this study was to investigate the effects of trunk control on motor function, which plays an important role in the daily activities of children with Cerebral Palsy (CP) and is often observed as a deficiency in children with CP. **Material and Methods:** Forty children with spastic bilateral CP, ages between 3 to 10 years and with Gross Motor Function Classification System (GMFCS) level I, II, and III were included in this study. Children were divided into two groups using randomization and in training group; Bobath Therapy for trunk control in addition to classical physiotherapy programs was performed for 45 minutes, for two days a week, for 6 weeks. In control group, existing physiotherapy program, 45 minutes for two days a week, continued. Any addition was not made into the existing program of the control group. Modified Ashworth Scale (MAS), Pediatric Berg Balance Scale (PBBS), Trunk Control Measurement Scale (TCMS), 1 Minute Walking Test (1MWT), Timed Up and Go Test (TUG) were applied to both groups before and after 6 weeks. Moreover, trunk muscle strength of children was evaluated. **Results:** After therapy, differences were found in results of MAS and PBBS, and trunk extensor strength between the training group and the control group in favor of the training group ($p < 0.05$). In addition, TCMS, 1MWT, TUG test and showed significant improvement compared to the average of the pre-treatment of the trunk muscle strength ($p < 0.05$). In addition, after treatment, training group's averages of TCMS, PBBS, 1MWT, YUG test and all trunk muscle strength were higher compared to the ones before treatment ($p < 0.05$). **Conclusion:** This study shows that adding exercises which aim trunk to conventional physiotherapy and exercise programs of children with CP, affects motor function positively.

Keywords

Cerebral Palsy, Spastic Bilateral Cerebral Palsy, Trunk Control, Bobath Therapy

1. Introduction

Cerebral Palsy (CP) is described as a permanent but non progressive impairment of the immature brain that is affected in the prenatal, perinatal or postnatal period [1]. Spastic type of CP is the most prevalent variant (up to 70%), which is characterized with muscle tone increase. Contractures and deformities which are proportionally consisted with the type and severity of CP can lead to postural disorders. Abnormal motor patterns, immature trunk control, abnormal tonus and disorder of postural control are affecting children's physical development negatively [1].

Trunk control is a complicated relation between skeletal muscles and neural systems. Musculoskeletal components include the biomechanic relationship between normal range of motion, spinal flexibility, muscle characteristics and single parts of the body. The primary neural components to achieve trunk control are neuromuscular synergy responses of motor process, visual, vestibular and somatosensorily systems which are included in the sensorial process. Beside these, it also includes high level integration process that leads to intuitional trunk control [2].

Children with CP have poor trunk control that is originated from different conditions. Decreased range of motion and contracture is involved with musculoskeletal problems, agonist and antagonist muscles' increased co-activation are the most important causes of disordered trunk muscle activity [2]. Trunk control is important for implementations of daily life. For healthy children, the postural and balance control is automatically done. It is difficult for children with CP to achieve this control, because of vestibular problems and balance disturbances [3].

Most researches for postural control in CP are studying the changes of gravity responses of lower extremity balance perturbation, standing position and then starting to walk or they are about trunk control primary for sitting. These researches show that for children with CP, independent sitting balance and trunk control are important for walking [3].

Trunk control is defined as an early determinant of daily life and related to balance, walking and functional abilities [4]. Because of the lack of movement ability, children with CP spend more energy compared to the same aged healthy children. Due to muscle tone abnormalities, muscle weaknesses, trunk control difficulties and skeletal deformities children with CP are spending up to 2 - 3 times more energy compared to the same aged healthy children during a sub maximal exercise [5] [6] [7].

The aim of this study was to estimate the effects of motor functional exercises

on trunk control on children with CP. For this purpose a strengthening and trunk control according to Bobath approach as well as a six week physical therapy and rehabilitation program were applied in order to observe the effects on motor functions.

2. Method

This study was performed at Hacettepe University, Faculty of Health Sciences at the Department of Physiotherapy and Rehabilitation between September 2012 and February 2014. Ethics approval was obtained from the Hacettepe University Medicine Faculty for Medicine, Surgery and Medication (HEK12/191-26) and from all parents a written informed consent was taken.

Inclusion criteria were,

- children living in Ankara
- children who were diagnosed with spastic bilateral cerebral palsy
- children who had a score of GMFCS [1] [2] [3] levels
- children who can walk with or without assisting devices
- children who were 3 - 15 years old
- who receive regular physical therapy twice a week
- who had no major visual impairments
- who had no orthopedic surgery and Botulinum Toxin-A injection at least for 6 months
- who were not using some drugs for inhibition of spasticity
- who did not have major auditory impairments, which leads to cooperation problems.

The children have been randomly divided in control or exercise groups. The children for the training group were encouraged for six weeks additional therapy while the control group continued their own regular physical therapy sessions twice a week for six weeks. The training group received Bobath therapy based trunk control training from the same physical therapist (GA) twice a week for 45 minutes [8].

Alfa error margin of 0.05 in work and beta value of 0.20 was set to at least 17 for a group. Considering the individual loss, it was decided that each group should be formed from 20 children. According to the power analysis which was executed in the early stages of the study, for training and control groups, in total of 40 CP diagnosed children (exercise group = 20, control group = 20) were planned for the research. However, considering the possibility of data loss 25% it was decided total 50 children (25 children for each group) were to be included to the study. Within this scope 25 children in the control group were followed up, because 1 of the children who did not completed the six week physical therapy program and 4 of the children did not attend the last examination, they were excluded. In the training group 25 children were followed up, because 3 of them having not completed the six weeks trunk control education therapy and 2 of them having not attended the final examination, they were excluded. Time period for the study was designated as 18 months. Study design diagram is shown

at **Figure 1**.

Inclusion criteria of the children were shown at **Table 1**.

TMCS was used for the functional trunk strength, postural control and trunk movement quality. The TCMS measures two main components of trunk control during functional activities: being a stable base of support, and being an actively moving body segment. Therefore, the scale consists of two main parts which are static sitting balance and dynamic sitting balance. The “static sitting balance” subscale evaluates static trunk control during movements of upper and lower limbs. Dynamic sitting balance is further divided into two subscales: selective movement control and dynamic reaching. Selective movement control of dynamic sitting balance is a scale which measures specific trunk movements in three planes (flexion/extension, lateral flexion, rotation) within the base of sup

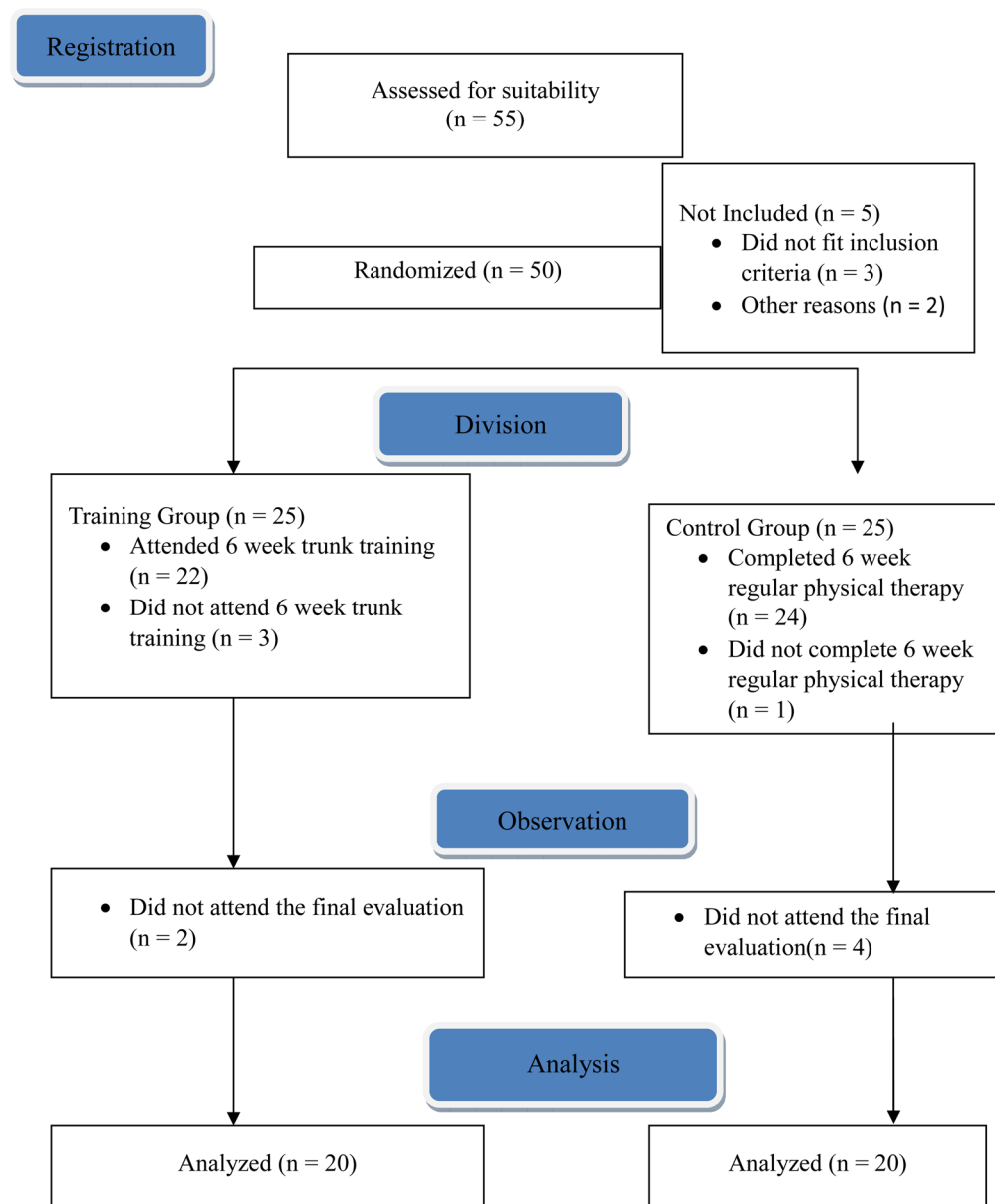


Figure 1. Diagram of the study design.

Table 1. Definitive characteristics of the children participated in the study (n = 40).

	Training Group	Control Group
	X ± SS	X ± SS
*Age (years)	6.55 ± 1.91	6.65 ± 1.84
*Sex (Female/Male) (n)	8/12	8/12
GMFCS (n)	20	20
*Level 1	4	4
*Level 2	10	11
*Level 3	6	5

The homogeneity between the groups was tried to be maintained. Age, gender and GMFCS levels were compared between the groups and no difference was found, Mann-Whitney U test, $P > 0.05$.

port. The subscale “dynamic reaching” evaluates the performance during three reaching tasks, requiring active trunk movements beyond the base of support. The total scale contains 15 items, with the subscales consisting of five, seven and three items, respectively. All items are scored on a two-, three- or four-point ordinal scale and administered bilaterally in case of clinical relevance. The total score of the TCMS ranges from 0 (lowest performance) to 58 (best performance). TCMS has been tested for reliability and validity in children with CP who were 8 - 15 years old [9].

To investigate functional balance in activities of daily life, Franjoine *et al.* developed Pediatric Berg Balance Scale which is a regulated version of Berg Balance Scale for children. The test has 14 sections and every section is scored from 0 to 4. The highest score is 56. PBBS is built up from easy to hard tasks. Functional processing was recently edited. Time section parts of the scale for static posture persistence were reduced and instructions were simplified for pediatric population [10].

Timed up and go and 1 minute walking test are used for the functional movement skills. Timed up and go test is used for measuring different components like walking speed, postural control, functional mobility and balance. Andersson *et al.* (2003) used this test to evaluate the results of strengthening program for adults with CP [11].

Back muscles were assessed in prone position; rectus abdominus was assessed in supine position, with manual muscle testing to determine trunk muscles.

Training group received trunk control exercise program based to Bobath therapy for six weeks. The program was applied twice a week. The control group continued only their regular physical therapy program without additional trunk control exercises. Regular physical therapy program includes positioning and reducing spasticity, strengthening abdominal, back and lower extremity muscles, sitting and standing balance and walking exercises.

The children were monitored whether they attend the 45 minute twice a week program excluded from the program. Both groups were evaluated in the beginning and at the end after six weeks of the program.

Measured data were presented as arithmetical mean ± standard deviation ($X \pm$

STD). Numeric data were evaluated as numbers and percentages. Relevance was accepted $p < 0.05$ in 95% of confidence interval. Non parametric Wilcoxon Signed Ranks Test was used for comparing ordinal parameters intragroup after before treatment whereas another non parametric Mann-Whitney U test was used for comparing ordinal parameters intergroup after before treatment. Spearman Correlation Test was applied to investigate the relation between groups. Stratified Randomisation method was preferred based on the fact that randomized selection can affect the study statically while assigning children to the groups.

3. Results

Forty children with CP were included in the study. Muscle strength differences between two groups before and after the treatment are presented in **Table 2**.

Trunk control, spasticity, timed up and go walking test, 1 minute walking test and Pediatric Berg Balance Scale results before and after treatment are shown in **Table 3**.

The differences between groups after treatment are demonstrated in **Table 4**.

Table 2. Muscle strength values in groups before and after treatment.

		Before Treatment Mean \pm STD	After Treatment Mean \pm STD	P
Training Group	Rectus Abdominus	3.08 \pm 0.46	3.40 \pm 0.45	0.001
	Right Obliques	2.75 \pm 0.46	2.85 \pm 0.43	0.020
	Left Obliques	2.75 \pm 0.46	2.85 \pm 0.43	0.020
	Back Muscles	3.10 \pm 0.47	3.51 \pm 0.40	0.001
Control Group	Rectus Abdominus	3.10 \pm 0.47	3.15 \pm 0.41	0.180
	Right Obliques	2.60 \pm 0.48	2.61 \pm 0.46	0.317
	Left Obliques	2.80 \pm 0.40	2.83 \pm 0.43	0.157
	Back Muscles	3.03 \pm 0.56	3.03 \pm 0.56	1.000

Table 3. Trunk control, spasticity, timed up and go, 1 minute walking test, pediatric berg balance scale values of the groups before and after treatment.

		Before Treatment Mean \pm STD	After Treatment Mean \pm STD	P
Training Group	TCMS	28.25 \pm 7.17	33.40 \pm 6.84	<0.001
	MAS	3.00 \pm 0.73	2.50 \pm 0.51	<0.002
	TUG	15.30 \pm 2.98	12.82 \pm 2.83	<0.001
	1MWT	173.50 \pm 39.21	197.50 \pm 36.19	<0.001
	PBBS	40.85 \pm 4.46	45.95 \pm 3.79	<0.001
Control Group	TCMS	30.70 \pm 6.84	32.40 \pm 5.41	0.278
	MAS	3.00 \pm 0.73	2.90 \pm 0.64	0.157
	TUG	14.40 \pm 2.98	13.74 \pm 2.65	0.401
	1MWT	188.00 \pm 38.57	198.00 \pm 33.74	0.180
	PBBS	42.25 \pm 3.73	43.20 \pm 3.64	0.317

The correlation between TCMS, functional movement tests and Pediatric Berg Balance Scale is shown in **Table 5**. There was a significant positive correlation between the TCMS total score, the PBBS and the 1 MWT and negative correlation between the timed up and go test ($p < 0.05$).

4. Discussion

This study was designed in consideration of the hypothesis that impaired trunk control could be important for children with CP, because trunk control affects activities of daily life and motor control negatively. After the exercise program when both groups were compared, the training group showed significant increase in muscle tone, balance and trunk muscle strength. Additionally the training group achieved more positive progression than the control group.

Several researches have proved that impaired trunk control is an important motor disorder for children with CP and can affect the performance of daily life activities such as sitting, reaching and walking negatively. Also many studies compared trunk control in healthy children with children who had CP and they predicted that achievement of trunk control is important. According to these facts, physical therapy and rehabilitation approaches which are designed in correlation with these findings are assumed to be more successful for trunk control and motor functions. In the light of these, when children with poor trunk control are evaluated with this manner and had the adequate treatment designed for them, their chance for a good quality of life is enhanced [12].

At the present time The International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY) is an important to plan programs and implement interventions [13] [14]. In our study TCMS was used for the assessment of the main topics such as static sitting balance, selective motor

Table 4. Intragroup values after treatment.

	Training Group (N = 20)		Control Group (N = 20)		Mann-Whitney U	
	X	SD	X	SD	Z	p
TCMS	33.40	6.84	32.40	5.41	-0.420	0.674
MAS	2.50	0.51	2.90	0.64	-1.990	0.047
TUG	12.82	2.83	13.74	2.65	-0.839	0.401
1MWT	1972.5	369.19	1982	331.74	-0.027	0.978
PBBS	45.95	3.79	43.20	3.64	-2.076	0.038

Table 5. Relation between timed up and go, 1 minute walking test, pediatric berg balance scale.

		1 Minute Walking Test	Timed Up and Go Test	Pediatric Berg Balance Scale
Trunk Control Measurement	r	0.986	-0.979	0.812
Scale (0 - 56 points)	p	<0.001	<0.001	<0.001

control of dynamic sitting balance and dynamic reaching for trunk control in sitting position. TCMS is a new test for trunk assessment which enables clinic information about trunk control by walking.

Some studies investigated trunk control is an important indicator of motor functions [15]. These studies reveal that trunk control is related to balance, walking and functional abilities which have an important role in daily life activities [16].

Specialist for nuclear physicist Gracovetsky developed a new biomechanical approach for body locomotion that is named spinal machine theory. According to his researches, he showed that people without lower extremities is capable of walking while using only their tuberositas ischiadica bones [17]. The assumption of walking and motor function is affected of body muscle strength; training group received special and amplified trunk exercises. After therapy the training group had significant strength improvement on trunk muscles whereas the control group had no significant differences on trunk muscle strength after the regular therapy program. These findings indicate that even if only for six weeks additional to the exercise program of the physical therapy program increases the strength of the trunk muscles. The increase of body muscle strength has positive effects on static and dynamic trunk control. Verheyden *et al.* revealed in different studies, trunk control assessment is related to balance, walking and functional abilities [18].

In our study when the trunk control results of both groups were compared, both groups had improvements. The training group had the most significant improvements after therapy. In this case, this also means that the TCMS test clearly shows the improvements of trunk control and how important the special trunk exercises.

Trunk control in children with CP can be assessed with tests mentioned before, but it can be also assessed by muscle strength and functional parameters. Therefore, a comprehensive evaluation was made in our study.

Literature researches show that Pediatric Berg Balance Assessment has been widely used for the assessment of functional balance. In our study positive scores are obtained in PBBS intergroup in favor of the training group before and the after treatment. Even though studies do not suggest that PBBS does not have a specific test battery for assessments of trunk control, PBBS includes tasks evaluating balance performances during sitting and standing, and the fact that it is related to trunk control proves it is not only a passive moving segment [19]. This result is important because it indicates that the trunk affection affects the functional balance.

Improvements are observed for both groups in results of the Timed up and go and 1 minute walking functional movement test after treatment. The training group had significant progress after six weeks of exercise therapy. The intergroup relation of the exercise and control group had no significant differences before and after treatment. However our results indicate that 1 MWT is a cheap, useful, simple test and it does not need any expensive equipment to assess gross motor function in the clinic. So this test can be a standard while assessing children with CP who are able to walk.

The relationship between functional movement tests and trunk control are supported with many studies which show that a multiple layer effect of erect posture while walking has a significant role. In our study PBBS, TUG and 1 minute walking tests had a significant positive relationship with TCMS total scores. These results demonstrate the relationship between trunk influence and functionality, and the critical role trunk plays in postural balance.

Spastic Bilateral children are affected from lower extremity spasticity. Barnes *et al.* and Filloux support the results for our study. They suggest that spasticity in lower extremity causes decrease in motor functional abilities, distortion of coordination in synergetic muscles and co-contraction increase among antagonistic muscles; this results in increase in trunk influence [19] [20]. Comparison of our groups before and after treatment yields significant positive improvement in favor of the training group. The fact that control group did not have a significant difference in muscle tone whereas training group has positive improvement supports that muscle tone is related to trunk control. This muscle tone differences between groups are linked with trunk exercises.

The strengths of our study are that all children with CP had the same characteristics and all the groups were randomly divided in homogenous groups. Our study was planned as a randomized controlled trial, which compares before and after treatment results. This study was planned according to our countries physical therapy norms and since it would be not ethical for the control group not to receive physical therapy, control group consists of children who receive regular physical therapy. Another strength of our study is that Bobath approach was planned and applied by a physiotherapist who educated 8 weeks of basic Bobath training.

5. Limitations

To evaluate the efficiency of the treatment is often not easy. This is due to the fact that it is very time consuming to get some objective assessment parameters. In the clinic, subjective parameter which has high validity and reliability are used; however these parameters usually are not enough to determine the quality of movement.

The assessment used in our study revealed some objective results; however none of the methods can assess muscle structure. Therefore, further researches should include some electromyography parameters.

The literature shows that Bobath therapy creates some differences after 0.5 - 1 year [21] [22] [23] [24]. The other limitation was that the therapy duration and interval. In our study the therapy lasted only for six weeks (2 sessions per week). Because it was a master thesis with time limitations longer follow up could not be done. In spite of this circumstance, the follow up of our patients continues in the clinic. After therapy results will be collected and reported.

6. Conclusion

Even though that the training group had more significant improvements than

the control group, the only significant differences were found in lower extremity spasticity, muscles of the trunk and PBBS scores.

Declaration of Interest

The authors report no declarations of interest; the research was funded solely by the authors themselves. The authors report no conflict of interest.

References

- [1] Kerem Gunel, M. (2009) Rehabilitation of Children with Cerebral Palsy from a Physiotherapist's Perspective. *Acta Orthopaedica et Traumatologica Turcica*, **43**, 173-180. <https://doi.org/10.3944/AOTT.2009.173>
- [2] Nicholson, J.H., Morton, R.E., Attfield, S. and Rennie, D. (2001) Assessment of Upper-Limb Function and Movement in Children with Cerebral Palsy Wearing Lycra Garments. *Developmental Medicine & Child Neurology*, **43**, 384-391.
- [3] Van der Heide, J.C. and Hadders-Algra, M. (2005) Postural Muscle Dyscoordination in Children with Cerebral Palsy. *Neural Plasticity*, **12**, 197-203. <https://doi.org/10.1155/NP.2005.197>
- [4] Furukawa, A., Iwatsuki, H., Nisiyama, M., Nii, E. and Uchida, A. (2001) A Study on the Subjective Well-Being of Adult Patients with Cerebral Palsy. *Journal of Physical Therapy Science*, **13**, 31-35. <https://doi.org/10.1589/jpts.13.31>
- [5] Ohrvall, A.M., Eliasson, A.C., Lowing, K., Odman, P. and Krumlinde-Sundholm, L. (2010) Self-Care and Mobility Skills in Children with Cerebral Palsy, Related to Their Manual Ability and Gross Motor Function Classifications. *Developmental Medicine & Child Neurology*, **52**, 1048-1055. <https://doi.org/10.1111/j.1469-8749.2010.03764.x>
- [6] Rose, J., Gamble, J.G., Burgos, A., Medeiros, J. and Haskell, W.L. (1990) Energy Expenditure Index of Walking for Normal Children and for Children with Cerebral Palsy. *Developmental Medicine & Child Neurology*, **32**, 333-340. <https://doi.org/10.1111/j.1469-8749.1990.tb16945.x>
- [7] Hanna, S.E., Rosenbaum, P.L., Bartlett, D.J., Palisano, R.J., Walter, S.D., Avery, L., *et al.* (2009) Stability and Decline in Gross Motor Function among Children and Youth with Cerebral Palsy Aged 2 to 21 Years. *Developmental Medicine & Child Neurology*, **51**, 295-302. <https://doi.org/10.1111/j.1469-8749.2008.03196.x>
- [8] Knox, V. and Evans, A.L. (2002) Evaluation of the Functional Effects of a Course of Bobath Therapy in Children with Cerebral Palsy: A Preliminary Study. *Developmental Medicine & Child Neurology*, **44**, 447-460. <https://doi.org/10.1111/j.1469-8749.2002.tb00306.x>
- [9] Heyrman, L., Molenaers, G., Desloovere, K., Verheyden, G., De Cat, J., Monbaliu, E. and Feys, H. (2011) A Clinical Tool to Measure Trunk Control in Children with Cerebral Palsy: The Trunk Control Measurement Scale. *Research in Developmental Disabilities*, **32**, 2624-2635. <https://doi.org/10.1016/j.ridd.2011.06.012>
- [10] Franjoine, M.R., Gunther, J.S. and Taylor, M.S. (2003) Pediatric Balance Scale: A Modified Version of the Berg Balance Scale for the School-Age Child with Mild to Moderate Motor Impairment. *Pediatric Physical Therapy*, **15**, 114-120. <https://doi.org/10.1097/01.PEP.0000068117.48023.18>
- [11] Andersson, C., Grooten, W., Hellsten, M., Kaping, K. and Mattsson, E. (2003) Adults with Cerebral Palsy: Walking Ability after Progressive Strength Training. *Developmental Medicine & Child Neurology*, **45**, 220-228.

- <https://doi.org/10.1111/j.1469-8749.2003.tb00335.x>
- [12] Yılmazyürk, Ş., Üçkardeş, A.O. and Eker, M. (2005) Yürüme Analizi. In: Özcan, H. Ed., *Cerebral Palsy*, Boyut, Istanbul, 95.
- [13] Rosenbaum, P., Paneth, N., Leviton, A., *et al.* (2007) A Report: The Definition and Classification of Cerebral Palsy. *Developmental Medicine & Child Neurology*, **49**, 8-14. <https://doi.org/10.1111/j.1469-8749.2007.tb12610.x>
- [14] Rosenbaum, P. and Stewart, D. (2004) The World Health Organisation International Classification of Functioning Disability and Health: A Model to Guide Clinical Thinking, Practice and Research in the Field of Cerebral Palsy. *Seminars in Pediatric Neurology*, **11**, 5-10. <https://doi.org/10.1016/j.spen.2004.01.002>
- [15] Verheyden, G., Williams, A.M., Ooms, L., *et al.* (2007) Validity of the Trunk Impairment Scale as a Measure of Trunk Performance in People with Parkinson's Disease. *Archives of Physical Medicine and Rehabilitation*, **88**, 1304-1308. <https://doi.org/10.1016/j.apmr.2007.06.772>
- [16] Assaiante, C., Mallau, S., Viel, S., *et al.* (2005) Development of Postural Control in Healthy Children: A Functional Approach. *Neural Plasticity*, **12**, 109-118. <https://doi.org/10.1155/NP.2005.109>
- [17] Gracovetsky, S.A. (2001) Analysis and Interpretation of Gait in Relation to Lumbopelvic Function. *4th Interdisciplinary World Congress on Low Back and Pelvic Pain*, Montreal, Canada.
- [18] Verheyden, G., Nieuwboer, A., Mertin, J., Preger, R., Kiekens, C. and De Weerd, W. (2004) The Trunk Impairment Scale: A New Tool to Measure Motor Impairment of the Trunk after Stroke. *Clinical Rehabilitation*, **18**, 326-334. <https://doi.org/10.1191/0269215504cr733oa>
- [19] Barnes, M., McLellen, L. and Suttar, R. (1994) Spasticity. In: Greenwood, R.J., Barnes, M.P., McMillan, T.M. and Words, C.D., Eds., *Neurological Rehabilitation*, Churchill Livingstone, Edinburg, 161-172.
- [20] Filloux, F.M. (1996) Neuropathophysiology of Movement Disorders in Cerebral Palsy. *Journal of Child Neurology*, **11**, 5-12. <https://doi.org/10.1177/0883073896011001S02>
- [21] Ketelaar, M., Vermeer, A., Hart, H., Beek, E.P. and Helders, P.M.J. (2009) Effects of a Functional Therapy Program on Motor Abilities of Children with Cerebral Palsy. *Physical Therapy*, **81**, 1534-1545. <https://doi.org/10.1093/ptj/81.9.1534>
- [22] Palmer, F.B, Shapiro, B.K, Wachtel, R.C., Allen, M.C., Hiller, J.E, Harryman, S.E., Mosher, B.S., Meinert, C.L. and Capute, A.J. (1988) The Effects of Physical Therapy on Cerebral Palsy. A Controlled Trial in Infants with Spastic Diplegia. *The New England Journal of Medicine*, **318**, 803-808. <https://doi.org/10.1056/NEJM198803313181302>
- [23] Trahan, J. and Malouin, F. (1999) Changes in the Gross Motor Function Measure in Children with Diffrens Type of Cerebral Palsy: An Eight-Month Follow-Up Study. *Pediatric Physical Therapy*, **11**, 12-17. <https://doi.org/10.1097/00001577-199901110-00003>
- [24] Hazneci, B. (2005) Cerebral Palsy Rehabilitasyonu. In: Kalyon, T.A., Ed., *Fiziksel Tıp ve Rehabilitasyon*, Gata Basımevi, Ankara, 545-556.

Self-Reported Experiences, Attitudes and Expectations of Infant Contacts in Medical Students; A Cross-Sectional Study in Ten Years' Interval

A. Marita Valkama^{1,2,3*}, Mailis Mäkelä¹, Jarmo Salo^{1,2}, Marja Ojaniemi^{1,2,3}

¹Department of Children and Adolescents, Oulu University Hospital, Oulu, Finland

²PEDEGO Research Center, University of Oulu, Oulu, Finland

³Medical Research Center, University of Oulu, Oulu, Finland

Email: *arjamaritavalkama@gmail.com, *marita.valkama@ppshp.fi

How to cite this paper: Valkama, A.M., Mäkelä, M., Salo, J. and Ojaniemi, M. (2017) Self-Reported Experiences, Attitudes and Expectations of Infant Contacts in Medical Students; A Cross-Sectional Study in Ten Years' Interval. *International Journal of Clinical Medicine*, 8, 216- 226.

<https://doi.org/10.4236/ijcm.2017.84021>

Received: March 16, 2017

Accepted: April 27, 2017

Published: April 30, 2017

Copyright © 2017 by authors and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Introduction: Medical students worked earlier as independent practitioners before paediatrics courses. Now it is denied. We evaluated students' experiences of infant contacts before and after the change. **Methods:** A cross-sectional questionnaire study consists of students attending paediatrics courses at University of Oulu in 2004-2006 and 2014-2015. **Results:** 229 of 241 (95.0%) students in the first cohort and 236 of 258 (91.5%) in the second completed the questionnaire. The mean (SD) age of the students was 25.1 (3.0) and 25.9 (3.0) ($p = 0.040$). In both cohorts two thirds of the students were familiar with holding infants in the lap, but two thirds had never bathed an infant. A half of males and one third of females had never fed an infant. Students approximated to manage with infants and believed to manage increased with age in both cohorts ($p < 0.001$ vs. $p = 0.019$). Students' perspective towards pediatrics as a future carrier choice declined from 30.3% to 22.0%. **Conclusions:** Students' experiences in handling and care of infants are quite low before paediatrics courses. The denial not to work as independent practitioner before paediatric courses did not decrease experiences. Medical students are motivated to have infant experiences in practice.

Keywords

Medical Students, Experiences, Infants

1. Introduction

Undergraduate medical students used to work as independent practitioners in

healthcare centres in Finland after the fourth study year up to the late 2010'. After that the possibility was denied and only working under guidance and mainly in hospitals remained. The core teaching in paediatrics takes place during the fifth study year. The ten-week paediatrics courses include lectures, small group sessions, home study, medical rounds and clinical skills training with patients on wards and in outpatient clinics and emergency units. Teaching and studying cover basic awareness to deal with a great variety of conditions and diseases connected to neonates, infants, toddlers, older children and teenagers. Medical students have two-week periods on different paediatric wards at Oulu University Hospital and they meet infants in all paediatric areas. Clinical skills for care of the youngest infants are developed mainly in neonatal care wards. During the neonatal care period the students should practice their skills in handling and examining neonates and young infants. Medical students participate in tutorial education sessions of two hours in small groups of 8 to 12 students and they take part in normal morning rounds. Parents are normally being present during daytime rounds and during examination of their own infants.

Walters *et al.* reported the results of a study, where basics of infant care were taught in a 1-day nurse-medical student preceptor program for 3rd year medical students. Although this was a very limited intervention, it significantly increased students' experiences in infant daily care procedures, including dressing an infant, changing a nappy, bathing and feeding an infant [1]. It is not known how the denial of permission to work as an independent practitioner in health care centres before clinical paediatrics courses of the fifth study year affects to experiences of young infant contacts among undergraduate medical students. We evaluated students' experiences, attitudes and expectations of young infant contacts before their clinical paediatrics courses at Oulu University Hospital by a questionnaire in ten years' interval.

2. Methods

Medical students attending their clinical paediatrics courses at Oulu University Hospital from autumn 2004 to autumn 2006 (Cohort 1) and a comparative control amount of students from spring 2014 to autumn 2015 (Cohort 2) were invited to complete a questionnaire about their young infant contacts. Because of the nature of the study of the Ethics Committee was not used. This study accords with the Declaration of Helsinki.

2.1. Questionnaires

Medical students were asked to complete the questionnaire voluntarily and anonymously. They were asked to describe their situation before the beginning of their paediatrics courses. The questionnaire included the background data, students' experiences of caring for infants [1], and knowledge of their attitudes and expectations of ability to manage with infants. We also asked if students had worked as independent practitioners in hospitals or health care centres before the courses. We also asked if they were interested in a career in paediatrics. After

questions there was space for the students to wish what kind of knowledge or teaching they are waiting for infant contacts. **Table 1** includes the structured questionnaire protocol.

2.2. Statistics

The questionnaire data were statistically analysed by using the Statistical Package for the Social Sciences (SPSS) 22.0. Means, standard deviations (SDs) or medians (range) was used. 95% confidence intervals when possible were calculated and the significance set at $p < 0.050$. In analysis of group differences, nonparametric (Chi-Square) and parametric (Independent sample's t) tests were used.

3. Results

There were 241 medical students in the Cohort 1 participating the five consecutive paediatrics courses from autumn 2004 to the end of 2006 and 258 students in the Cohort 2 participating in four consecutive courses from spring 2014 to the end of the year 2015 at Oulu University Hospital. 229 students (95.0%) of the Cohort 1 and 238 (91.5%) of the Cohort 2 completed the questionnaire. The percentage of the male students in the cohorts was 32.3% and 48.7%. Gender difference between the study cohorts changed significantly ($p < 0.001$).

Table 1. Medical students' questionnaire protocol.

<i>Background, Complete</i>	<ul style="list-style-type: none"> • Age • Gender • Home town origin • Number of siblings in one's native family • Number of offspring
<i>Care and handling of infants, Encircle the frequency</i>	<ul style="list-style-type: none"> • Holding in lap; No-over 5 times • Dressing an infant; No-over 5 times • Changing a nappy; No-over 5 times • Bathing an infant; No-over 5 time • Feeding an infant; No-breast/ bottle-solid food
<i>Experiences, Attitudes and Expectations, Cross alternatives you agree</i>	<ul style="list-style-type: none"> ○ I have taken care of infant siblings ○ I have been a babysitter for infants ○ I am familiar with handling infants ○ I have not dared to touch infants ○ I am frightened to handle infants ○ I feel tense when handling infants ○ I think I manage with infants ○ I am waiting for handling infants
<i>Working as practitioners, Cross the right answers</i>	<ul style="list-style-type: none"> ○ I have not worked as a physician ○ I have worked as a physician in hospitals ○ I have worked as a physician in health care centres
<i>Interest in pediatrics, Cross if you agree</i>	<ul style="list-style-type: none"> ○ I am interested pediatrics as a career choice
<i>Open question, Write the answer</i>	What kind of knowledge or teaching you wish to have about meeting, caring or treating infants?

3.1. Background

Most of the medical students (146; 63.8% vs. 156; 65.7%) came from the University Hospital area in Northern Finland. Of the remaining students, 19 (8.3%) vs. 17 (7.2%) did not reveal their origin.

Seventeen (7.4%) of students in the Cohort 1 and 13 (5.5%) in the Cohort 2 were the only offspring in their families. Eighty-three (36.2%) of the students in the Cohort 1 had two, 59 (25.8%) had three, 32 (14.0%) had four, 15 (6.6%) had five and 22 (9.6%) had more siblings in their native families. The corresponding percentages for the Cohort 2 were 80 (33.6%), 75 (31.5%), 28 (11.8%), 18 (7.7%) and 18 (7.7%), respectively.

Eighteen (9 male and 9 female) (7.9%) students in the Cohort 1 had a total of 35 of their own children, and 21 (13 male and 8 female) (8.9%) students in the Cohort 2 had the same.

The ages of the students in the Cohort 1 ranged between 22 and 43 and in the Cohort 2 between 22 and 39 years. The mean ages (SD) of the students were 25.1 (3.0) years in the Cohort 1 and 25.9 (3.0) years in the Cohort 2 ($p = 0.040$). The mean age (SD) of the females between the Cohorts changes significantly from 24.8 (2.9) to 26.1 (3.2) years ($p = 0.001$) but the mean age (SD) of the males stayed (25.6 (3.1) vs. 25.7 (2.7) years).

3.2. Common Care and Handling

Experiences of detailed infant care and handling results are shown as percentage bars in the **Figure 1**. Two thirds of the students in both cohorts (no gender difference) had never bathed an infant (**Figure 1(A)**). The male students, however, represented most often those students who had never dressed an infant or changed a nappy (**Figure 1(A)** and **Figure 1(B)**). Also the amount of males who had never held infants in lap increased between the Cohorts (**Figure 1(B)**). The most common alternative procedure for students was holding in the lap, where repetitions of over five times were reported by two thirds of the students in both Cohorts (**Figure 1(C)**). The percent for males decreased and for females increased producing gender difference in the second cohort (**Figure 1(C)** and **Figure 1(D)**). The female students had changed nappies over 5 times significantly more often than males in both groups (**Figure 1(C)**). Female students had repeatedly dressed infants significantly more frequently than male students in both Cohorts (**Figure 1(C)** and **Figure 1(D)**). But the males increased there significantly in ten years (**Figure 1(D)**).

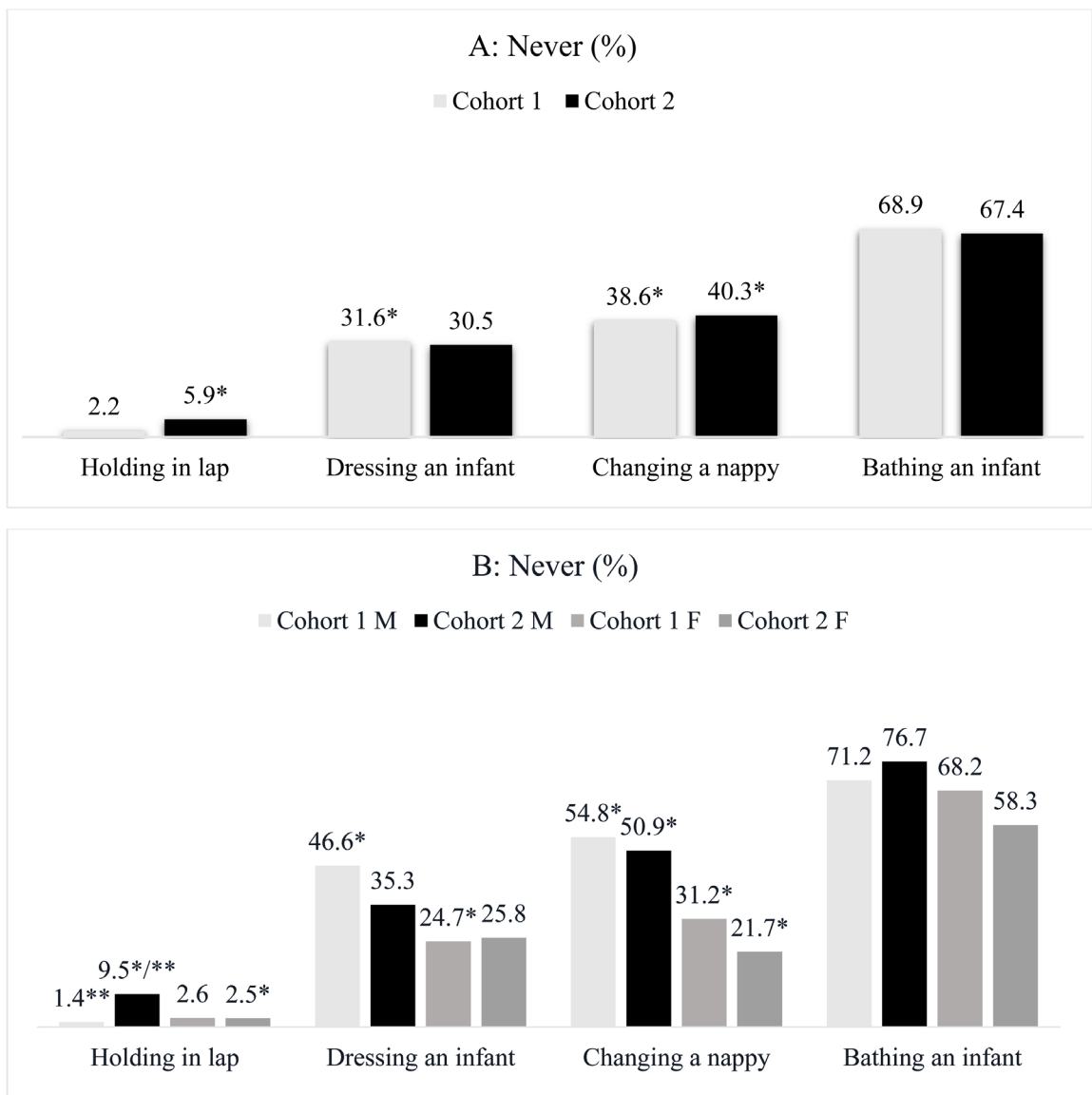
Eighty-six (37.9%) of the students in the Cohort 1 (52.1% of the males and 31.2% of the females) had never fed infants. Correspondingly, 91 (38.5%) of the students in the Cohort 2 neither had fed infants (49.1% of the males and 28.3% of the females). The difference between genders was significant (Cohort 1: $p = 0.003$ and Cohort 2: $p = 0.001$). However, 120 (52.9%) of the students in the Cohort 1 (35.6% of the males and 61.0% of the females) and 142 (60.2%) of the students in the Cohort 2 (49.1% of the males and 70.8% of the females) had bottle-fed, with a significant difference between the genders ($p < 0.001$ in both

Cohorts). Furthermore, 120 (52.9%) of the students in the Cohort 1 (43.8% of the males and 57.1% of the females, $p = 0.066$) and 128 (54.2%) of the students in the Cohort 2 (44.0% of the males and 54.2% of the females, $p = 0.003$) had given solid food, respectively.

3.3. Experiences, Attitudes and Expectations

The responses to the questions concerning experiences, attitudes and expectations are shown as percentage bars in **Figure 2**.

The female students were far more experienced than male students in babysitting in both the Cohorts. However, they more often than males considered it a little frightening to handle infants especially in the Cohort 1. Despite that female students wished to handle infants more eagerly than male students in both Cohorts. The difference in male students' belief to be able to manage with infants diminished in ten years in comparison to female students. Students' own



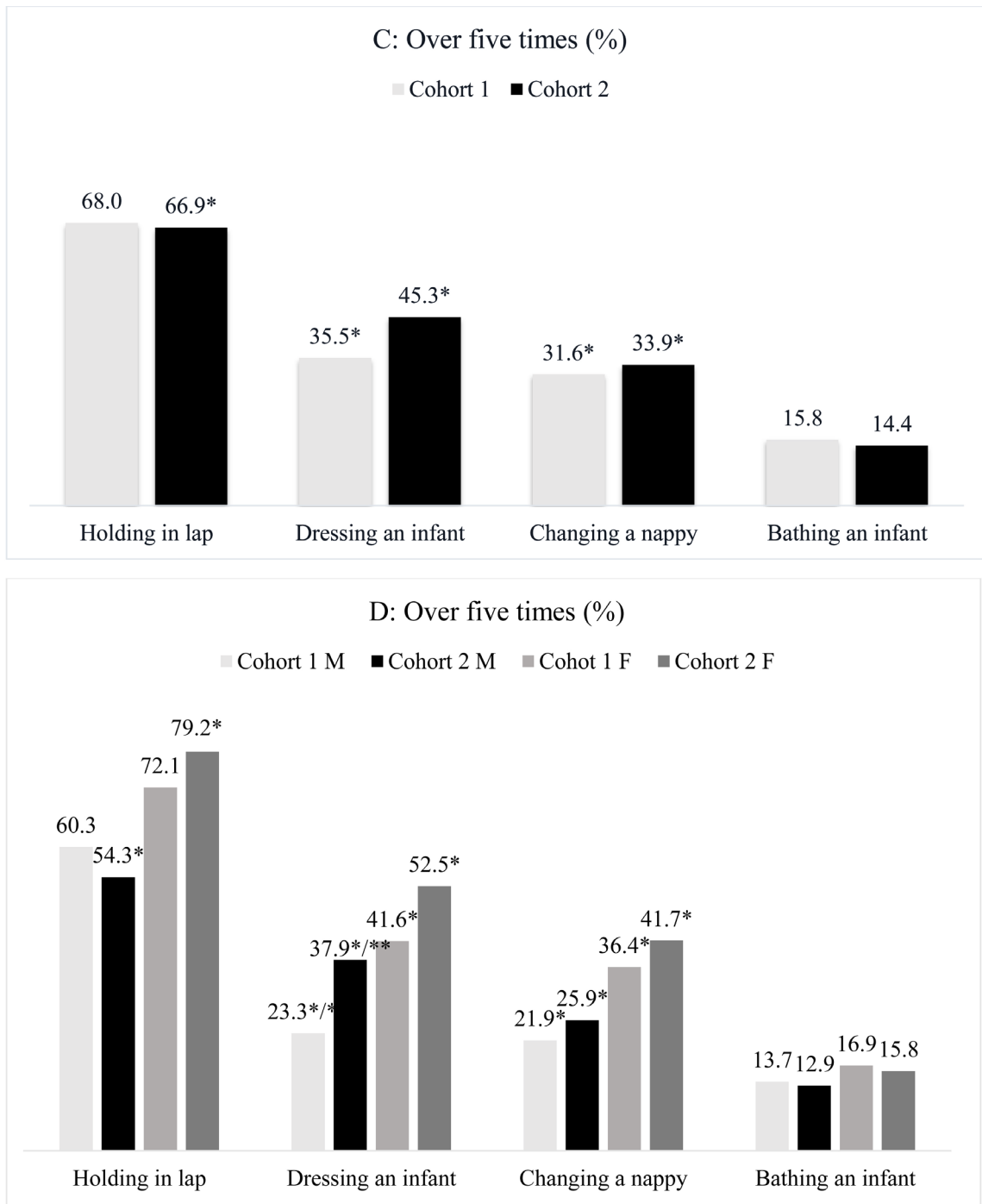
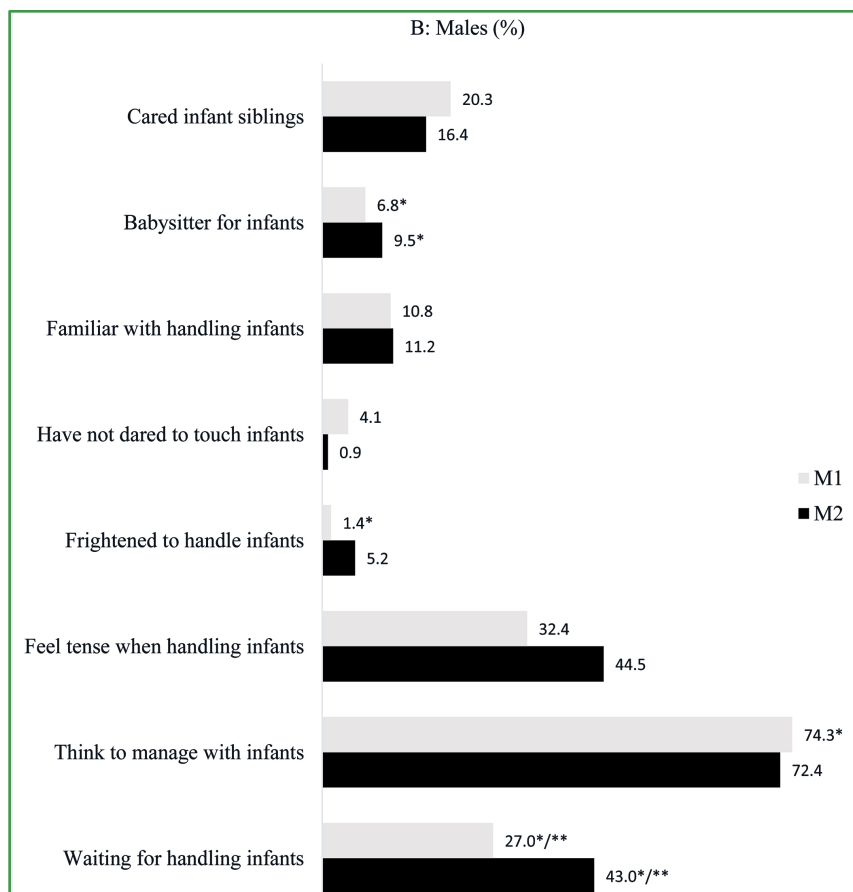
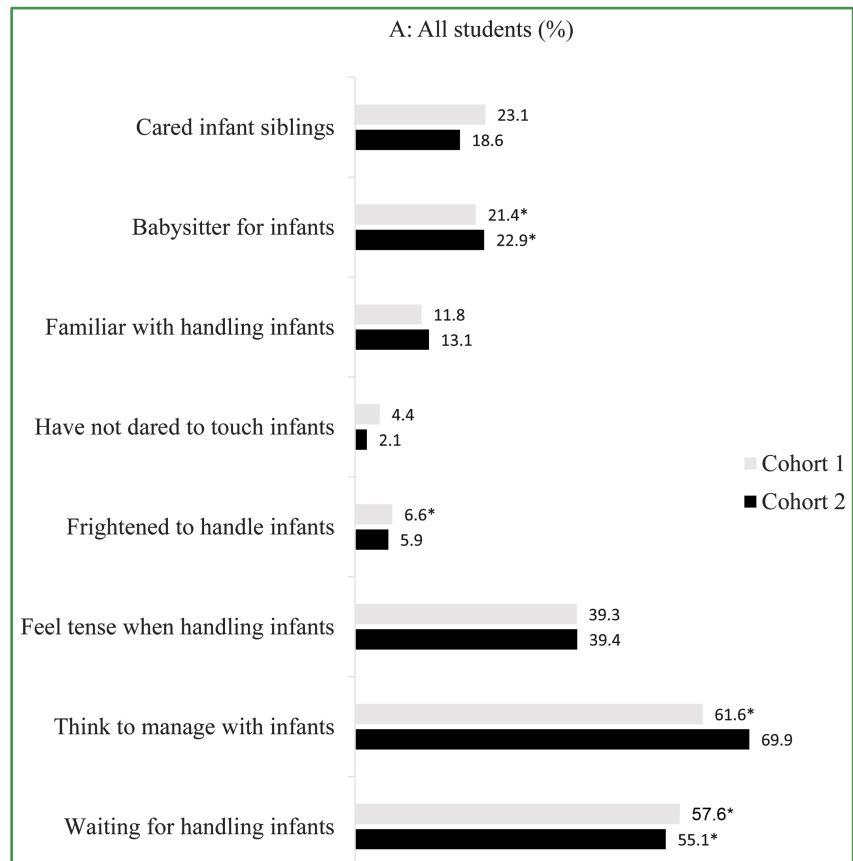


Figure 1. Experiences of infant care among medical students in cohort years 2004-2206 (C1) and 2014-1015 (C2). Frequencies of active care procedures (never or over five times) are shown as percentage bars of students. (A): Percentages of never for students in cohorts. (B): Separate percentages of never for male (M) and female (F) genders in cohorts. (C): Percentages of over five times for students in cohorts. (D): Separate percentages of over five times for genders in cohorts. Chi-Square Tests: p-value < 0.050 * for differences between male and female students inside the cohorts 1 or 2 and ** for differences of the same gender between the cohorts.

believes to manage in handling infants increased significantly with students getting older in both Cohorts (p < 0.001 vs. p = 0.019).

Two hundred and twenty (96.1%) of the students in the Cohort 1 and 223



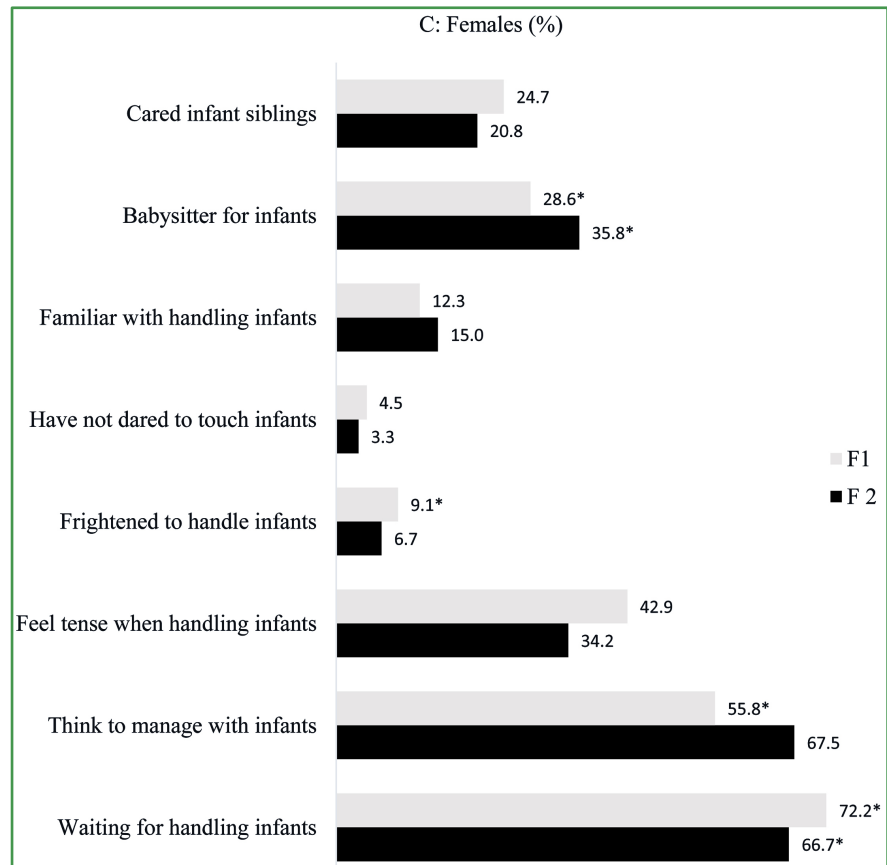


Figure 2. The positive answers of medical students in the cohort years 2004-2006 (Cohort 1) and 2014-2015 (Cohort 2) to questions of their experiences, attitudes and expectations in regard to infants are shown as percentages. (A): Percentages between the cohorts. (B): Percentages for males in the cohorts (M1 and M2) (C): Percentages for females in the cohorts (F1 and F2). Fishers's Exact Tests: $p < 0.050$ *for differences between male and female students inside the cohorts 1 or 2; **for differences of the same gender between the cohorts.

(94.5%) in the Cohort 2 had worked in a healthcare environment before paediatrics courses. Thirty-one (13.5%) of the students in the Cohort 1 and 120 (52.9%) of the Cohort 2 had worked in hospitals and correspondingly, 205 (89.5%) vs. 74 (31.3%) in healthcare centres before coming to paediatric courses.

Sixty-nine (30.3%) of the students (23.0% of the males and 33.8% of the females) in the Cohort 1 and respectively, 52 (22.0%:19.8% of the males and 24.2% of the females) in the Cohort 2 reported an interest in paediatrics as a possible future career.

3.4. Preferences Regarding Teaching

In free comments, 68 (29.7%) of the students in the Cohort 1 and 122 (51.7%) in the Cohort 2 wrote their wishes for the course. They wanted first of all to handle as many neonates and infants as possible, to learn to examine infants, and to become familiar with their features. Students especially wished to learn to distinguish sick from healthy infants.

3.5. Discussion

Medical students came mainly from families with more than one offspring. Two thirds of the students had held infants in their laps more than five times, but two thirds of students had never bathed an infant with no change in ten years. One third of the students had never fed an infant, but a half of the students had given solid food in both cohorts. The students mainly expected to manage with young infants although many of them felt frightened or tense. Almost all the students in both cohorts had worked in a healthcare before their paediatrics courses. One third of the first cohort reported an interest in paediatrics as a career choice, but only one fifth in the second cohort. One third of the Cohort 1 and a half of the Cohort 2 indicated a wish to see and assess as many neonates and young infants as possible. They especially wanted to learn to distinguish sick from healthy infants.

Although two thirds of the students had held an infant in their laps, only one third of them were familiar with everyday procedures such as changing nappies. However, dressing of infants showed increasing numbers both in males and females. The increase in the amount of male students with own children and the increased age of female students may have effects on that. Furthermore, half of the students had given solid food to infants, but more than a third had never fed an infant with no change in ten years. An empirical research has evidenced that direct patient contacts for only 1-day by the guidance of an interactive nurse can increase basic child care experiences in medical students significantly in comparison to not guided students. For instance, percentage for bottle feeding increased from 11% to 55% and bathing the child from 2% to 36%. [1]

Male students were more self-confident, less frightened and less sensitive than female students, especially in the Cohort 1, in their responses concerning managing with infants, although female students were more experienced. A video-taped objective structured clinical examination study has shown that female students consistently report decreased self-confidence and increased anxiety related to their competence [2]. According to meta-analyses female medical students underestimate their performance more often than male students [3]. Supposedly encouragement, training and positive feedback could be the best practices to work out one's competence. It has been suggested that extra years of life experience before studies could improve social factors important to personal development [4]. Theoretically such extra years may have helped here, because reports of familiarity with the care increased significantly with the age of the students.

A large answering percentage of medical students show they are motivated to reflect their feelings and experiences of infants and willing to express wishes in teaching. The Cohort 1 consisted of five courses and the second of four reflecting rising numbers of medical students. According to reports, valuable practical clinical skills among new medical trainees or residents in hospitals are declining [5] [6]. The main reason for this has been supposed to be a lack of clinical skills

teaching in medical schools [5] [6]. The increased numbers of medical students place a question, what is adequate amount of clinical teaching and how we can offer teaching enough in clinical patient contacts. Clinical education in the ward is very valuable for medical students, who gain experience of examination, caring and communication [7] [8]. It is known that patient experiences affect medical students' learning by providing insight into real problems [8] [9] [10] [11]. Bed side teaching in medical education has inspired to new thinking of executive possibilities. As an implementation to that residents and interns of staff members have been used more as bedside teachers to students [12].

This study has some limitations. The questionnaire we used here has not been validated in different populations. However, we used reliable simple questions that are easy to answer with straightforward interpretation [1]. The students' experiences with older children were not evaluated, which may have influenced the answers in both of the cohorts. For comparability, the amounts of students for the cohort 2 were based on the number of students in the cohort 1, and both of the cohorts included consecutive courses. We did not consider the effect of previous university studies before entering medical school, and that might have had an impact on the answers. However, in Finland, all the students entering medical school have gone through at least 12 years of education.

It seems here that the denial of permission to work as an independent practitioner in health care centres before clinical paediatrics courses did not decrease experiences of young infant contacts, neither changed many attitudes or expectations among undergraduate medical students. Most of the medical students had worked as practitioners, mainly in healthcare centres in the Cohort 1 and in hospitals in the Cohort 2. During their four-year studying they have attended clinical courses in otorhinolaryngology, ophthalmology and dermatology, among other subjects, which are matters useful to paediatrics. Young infants, healthy or sick, may be very challenging. Medical students no doubt need training and experience when it comes to examining sick children [13]. Over half of the students in the Cohort 2 mentioned it very important to assess as many infants as possible during courses to learn to distinguish sickness in infants.

One third of the medical students in the Cohort 1 and one fifth in the Cohort 2 (females more frequently than males) indicated an interest in paediatrics as a future career choice at the beginning of their paediatrics courses. Paediatrics has elsewhere been preferred by 7% - 28% of female students and by 1% - 16% of male students [14]. Our male students rated their interest higher.

4. Conclusion

Self-reported experiences of medical students in handling and care of infants are quite low before their paediatric courses. The denial not to be able to work as independent practitioner in health care centres before paediatric courses seems not to change experiences. Students need supportive guidance and encouragement to handle infants. Medical students are willing to learn and have experiences in practice.

References

- [1] Walter, R.S., Trzcinski, K.M., Lawrence, J.S. and Simonetti, R.M. (1997) Pediatric Registered Nurses as Preceptors for 3rd-Year Medical Students: A Program to Enhance the Pediatric Inpatient Experience. *Teaching and Learning in Medicine*, **9**, 91-95. <https://doi.org/10.1080/10401339709539821>
- [2] Blanch, D.C., Hall, J.A., Roter, D.L. and Frankel, R.M. (2008) Medical Student Gender and Issues of Confidence. *Patient Education and Counseling*, **72**, 374-381.
- [3] Blanch-Hartigan D. (2011) Review: Medical Students' Self-Assessment of Performance: Results from Three Meta-Analyses. *Patient Education and Counseling*, **84**, 3-9.
- [4] Shacklady, J., Holmes, E., Mason, G., Davies, J. and Dornan, T. (2009) Maturity and Medical Students' Ease of Transition into the Clinical Environment. *Medical Teacher*, **31**, 621-626. <https://doi.org/10.1080/01421590802203496>
- [5] Ramani, S., Ring, B.N., Lowe, R., Ring, B.N., Lowe, R. and Hunter, D. (2010) A Pilot Study of Assessing Knowledge of Clinical Signs and Physical Examination Skills in Incoming Medicine Residents. *The Journal of Graduate Medical Education*, **2**, 232-235. <https://doi.org/10.4300/JGME-D-09-00107.1>
- [6] Verghese, A. (2010) Beyond Measure: Teaching Clinical Skills. *The Journal of Graduate Medical Education*, **2**, 1-3. <https://doi.org/10.4300/JGME-D-10-00008.1>
- [7] Nadolski, G.J., Bell, M.A., Brewer, B.B., Frankel, R.M., Cushing, H.E., and Brokaw, J.J. (2006) Evaluating the Quality of Interaction between Medical Students and Nurses in a Large Teaching Hospital. *BMC Medical Education*, **6**, 23. <https://doi.org/10.1186/1472-6920-6-23>
- [8] Williams, K.N., Ramani, S., Fraser, B. and Orlander, J.D. (2008) Improving Bedside Teaching: Findings from a Focus Group Study of Learners. *Academic Medicine*, **83**, 257-264. <https://doi.org/10.1097/ACM.0b013e3181637f3e>
- [9] Dornan, T. and Bundy, C. (2004) What Can Experience Add to Early Medical Education? Consensus Survey. *BMJ*, **329**, 834-837. <https://doi.org/10.1136/bmj.329.7470.834>
- [10] Littlewood, S., Ypinazar, V., Margolis, S.A., Scherpbier, A., Spencer, J. and Dornan, T. (2005) Early Practical Experience and the Social Responsiveness of Clinical Education: Systematic Review. *BMJ*, **331**, 387-391. <https://doi.org/10.1136/bmj.331.7513.387>
- [11] Noor, S., Batra, S. and Byrne, A. (2011) Learning Opportunities in the Clinical Setting (LOCS) for Medical Students: A Novel Approach. *Medical Teacher*, **33**, e193-e198. <https://doi.org/10.3109/0142159X.2011.557413>
- [12] Peters, M. and ten Cate, O. (2014) Bedside Teaching in Medical Education: A Literature Review. *Perspectives on Medical Education*, **3**, 76-88. <https://doi.org/10.1007/s40037-013-0083-y>
- [13] Craze, J. and Hope, T. (2006) Teaching Medical Students to Examine Children. *Archives of Disease in Childhood*, **91**, 966-968. <https://doi.org/10.1136/adc.2005.092502>
- [14] Alers, M., van Leerdam, L., Dielissen, P. and Lagro-Janssen, A. (2014) Gendered Specialities during Medical Education: A Literature Review. *Perspectives on Medical Education*, **3**, 163-178. <https://doi.org/10.1007/s40037-014-0132-1>

Ultrasound-Guided Infraclavicular Axillary Vein Cannulation

Miguel A. García-Díaz, Manuel Ruiz-Castro

Department of Anesthesia, University Hospital Príncipe de Asturias, Madrid, Spain

Email: mruizc@hotmail.com

How to cite this paper: García-Díaz, M.A. and Ruiz-Castro, M. (2017) Ultrasound-Guided Infraclavicular Axillary Vein Cannulation. *International Journal of Clinical Medicine*, 8, 227-235.

<https://doi.org/10.4236/ijcm.2017.84022>

Received: January 24, 2017

Accepted: April 27, 2017

Published: April 30, 2017

Copyright © 2017 by authors and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Background and Objective: Percutaneous central venous cannulation is a common invasive procedure. In comparison with an external landmark technique, the advantages of ultrasound-guided venous access include direct visualization of the anatomy and *in vivo* visualization of venous cannulation. **Methods:** We evaluated an ultrasound-guided technique for infraclavicular axillary vein cannulation, focusing on its ease of use, success rate and complications rate. One hundred and twenty patients who submitted to central venous catheter placement were punctured using our technique. The patients were positioned so that their ipsilateral upper limb was abducted at 90° to the longitudinal axis, which makes it possible to visualize the infraclavicular vessels due to the elevation of the clavicle, thereby improving accessibility. **Results:** Cannulation was successful in all patients. The median time from the start of the first puncture (of the skin) until the aspiration of blood was 15 s (range 7 - 135 s). Both infraclavicular axillary veins were cannulated, and the vein was punctured successfully at the first attempt in 95% of the patients, without complications during the procedure. **Conclusion:** We propose an ultrasound-guided infraclavicular approach of the axillary vein, with a high success rate and no complications in the present cohort.

Keywords

Ultrasonography, Catheterization, Central Venous, Central Venous Catheter, Ultrasound-Guided Technique, Infraclavicular Axillary Vein

1. Introduction

Central venous catheterization (CVC) is a common invasive procedure. Complications associated with CVC are often related to blind passage of the needle, and include bleeding, arterial puncture, pneumothorax, nerve damage, pain and

other less common complications.

Most authors [1] [2] [3] [4] [5], currently recommend the use of ultrasound (US) for placing catheters in adults. In comparison with the use of superficial anatomical landmarks, the advantages of US-guided venous access include direct visualization of the anatomy and the *in vivo* visualization of venous cannulation [6] [7]. The use of real-time US technology to guide needle insertion has improved success rates and reduced the incidence of complications [1] [2].

It has recently been shown that US is beneficial for catheterizing the internal jugular vein (IJV), as well as the axillary and mid-arm basilica and cephalic veins. The IJV is more popular due to the easier access and perceived lower risk of complications, however, subclavian vein (SCV) catheter placement is associated with a lower incidence of infection and thrombosis [8] [9] [10].

Most authors contend that infraclavicular approaches are difficult to visualize with US due to the SCV being located under the clavicle and the inability to place the linear array probe in a position that allows the vessel to be visualized. For this reason, US-guided SCV access is often described using a supraclavicular [8], or a distal approach.

We have developed an US-guided infraclavicular approach for axillary catheter placement using a standard high-frequency linear probe. The location of the axillary vein approach is very proximal, close to, or even over the lip of the first rib, where the SCV is renamed, and hence this approach could be comparable to the approach of the SCV.

2. Method

Ethical approval for this prospective study (protocol number: PI/422010), was provided by the Ethical Committee of the Príncipe de Asturias University Hospital, Alcalá de Henares, Madrid, Spain (chairperson: Prof. Elvira Poves Martínez) on 25 November 2010. Written informed consent to participate was obtained from each patient.

A GE Healthcare Venue 40 devices and a GE 12L-SC multifrequency linear transducer at 5 - 13 MHz (GE Healthcare, a division of General Electric Company, Piscataway, New Jersey, USA) were used. Both authors performed this procedure in sixty patients each. The patients were assigned to the study in a consecutive way. The objective of this work was to make a purely descriptive study, so it was not considered to perform the comparison with the conventional technique without ultrasonography, given the high success rate in the US-guided puncture. Therefore, the size of the sample was intended to be representative, although we did not perform a calculation of the sample size when not having to observe differences with a control group.

The position of the patient and the anesthesiologist varies depending upon the standard external-anatomical-landmark-guided catheterization technique. The patient should be positioned so that the ipsilateral upper limb is abducted at 90° to the longitudinal axis, which makes it possible to visualize the infraclavicular vessels due to the elevation of the clavicle, thereby improving accessibility. This

improves the US visualization of the infraclavicular axillary vein (IAV), making almost its entire length visible. If the probe is moved laterally, it is possible to visualize the course of the axillary vein, while if the probe is moved medially with a slight cranial angulation, it is possible to visualize SCV.

Moreover, placing the patient in the Trendelenburg position increases venous engorgement and ease of viewing.

The anesthesiologist puts the patient's head and locates the sterile field and the equipment needed for the cannulation cephalad to the patient's arm or beside it, allowing intraoperative puncture. The anesthesiologist's non-dominant hand holds the US probe, while the dominant hand performs the cannulation.

Initial exploration of the area with US is essential for placing the probe infraclavicularly, parallel and in close contact with the bottom edge of the clavicle, in the infraclavicular fossa, just lateral to the clavicular head of the sternocleidomastoid muscle **Figure 1**.

A slight cranial angulation of the probe will facilitate the visualization of the infraclavicular vessels, which will be visible as long as the probe is moving parallel to the clavicle, medially and laterally. The vessels on the left side are caudal to those on the right side and the required degree of cranial angulation of the US probe is lower on the left side.

The image obtained from the IAV is medial and superficial to the infraclavicular axillary artery (IAA), and has an elongated shape, close to the long axis view **Figure 2**.

Furthermore, the pressure of the US probe on the patient can partially collapse the vein. In US imaging, the IAA is normally viewed in cross section, and it appears rounded, pulsatile, and incompressible under the pressure of the US probe.

In-plane venipuncture is achieved from the lateral end of the probe, in the same plane as the US beam, which displays the progress of the needle as it moves

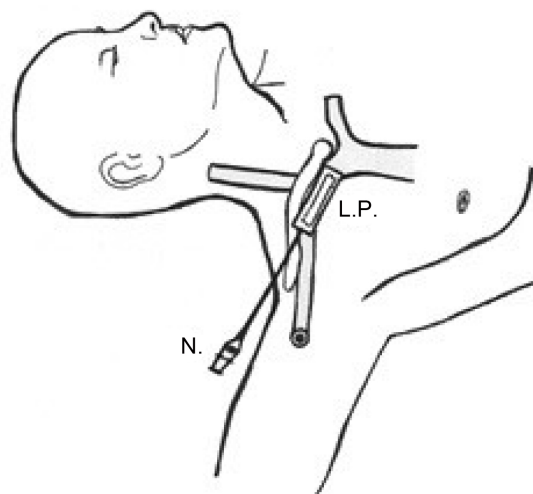
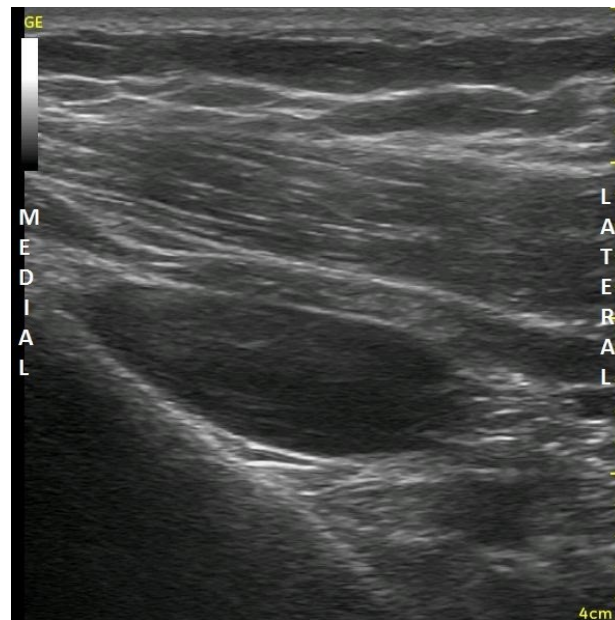
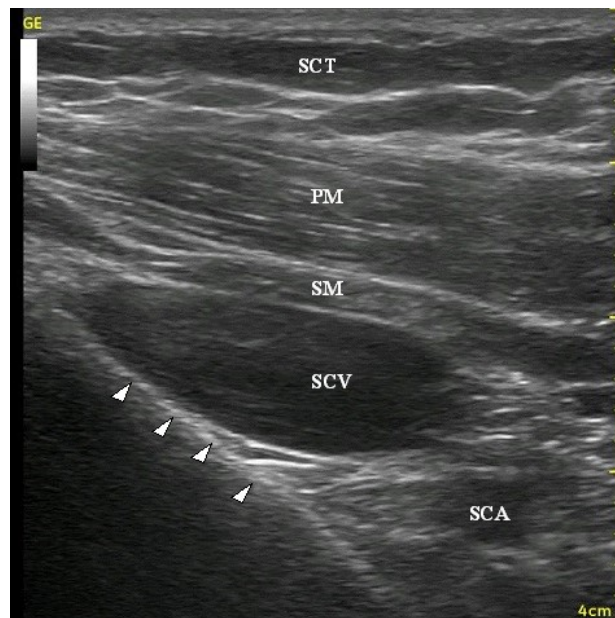


Figure 1. Artistic drawing of the location and placement of the linear array probe (LP) and the needle (N) during the infraclavicular ultrasound-guided approach to cannulation of the right axillary vein.



(a)



(b)

Figure 2. Ultrasonographic image obtained at the infraclavicular level. (a) Blank image. (b) Labeled image. SCT, subcutaneous cellular tissue; PM, pectoralis major muscle; SM, subclavian muscle; SCV, subclavian vein; SCA, subclavian artery; Arrowheads, first rib.

into the lumen of the vein. It is of paramount importance that the operator observes the needle advancement in real time. To improve visualization of the puncture needle, it is helpful to exert a slight pressure on the inner edge of the US probe so that the angle between the US beams and the needle is as close as possible to 90°.

While inserting the needle, mild aspiration is performed with the syringe, so

that blood is observed entering the syringe when the tip of the needle reaches the vessel lumen. Real-time visualization of the extent of the venous lumen demonstrates that the needle tip is at the correct location.

The venous wall is more elastic in younger patients, and so the tip of the needle can be pushed against the wall without perforating it. Aspiration of blood will be necessary to show that the needle tip has reached the vein lumen, as the progress of the needle tip will be visible on the US image. Only minimal further progression from this point will cause the needle tip to enter the lumen without piercing the posterior venous wall.

The usual Seldinger procedure is then performed. The non-dominant hand releases the US probe and holds the needle. The guide wire is introduced into the venous lumen without a real-time US view. Once the guide wire is in the vein, its position is rechecked with the probe, and the supraclavicular area is scanned to detect possible migration of the guide wire into the IJV **Figure 3**.

Early possible complications such as pneumothorax or hematoma, as well as catheter-tip position are checked after CVC positioning in every patient by means of a chest x-ray.

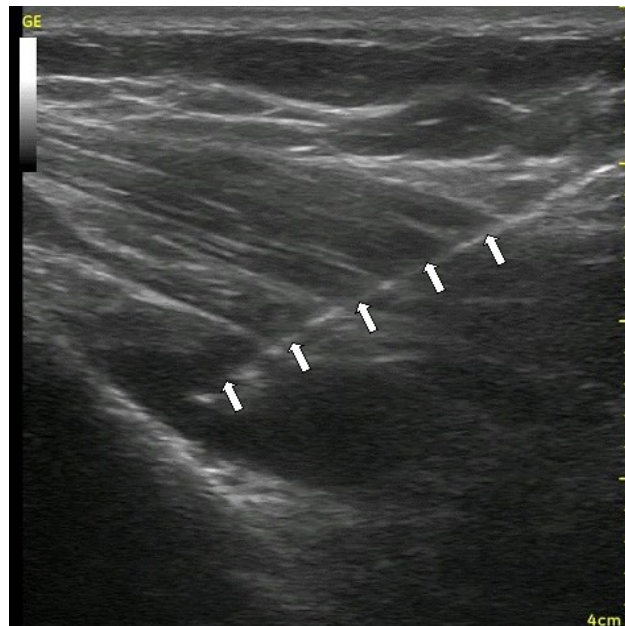
3. Results

For a one year period, 120 patients who submitted to CVC were punctured using our technique. In all except one case the IAVs could be easily visualized from the infraclavicular level, so no patients were excluded from the study. The demographic data of the patients are listed in **Table 1**.

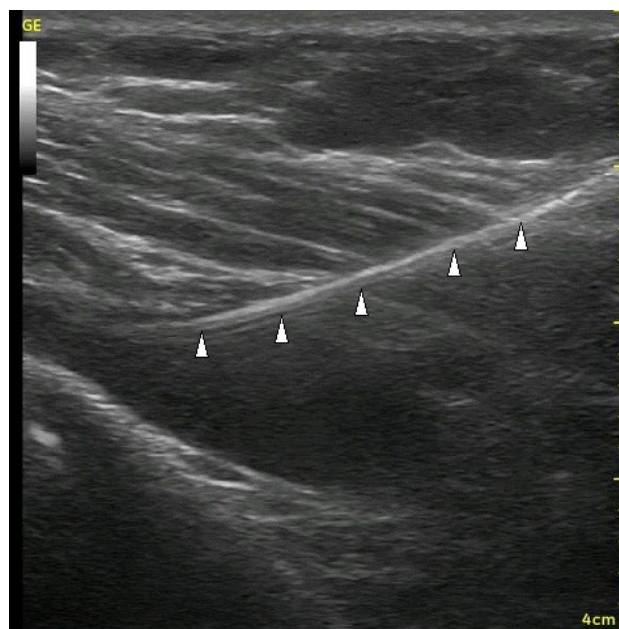
A single attempt was required in 95% of the cases (114 patients). A second attempt was needed in three cases, two of them because although the IAV was catheterized at the first attempt, the vein was “lost” during guide-wire manipulation, thus requiring a second IAV puncture. In another case a chest x-ray revealed that the catheter had migrated distally to the distal axillary vein, which made it necessary to remove the catheter and puncture again on the other side. In one IAV the venous lumen on the left side could not be seen because it was thrombosed, but it could be catheterized on the other side. Another guide wire that migrated into the IJV could be repositioned without a new puncture, partially removing the guide wire, and reintroducing it under US guidance. The mean number of attempts per patient was 1.05. More than two attempts at venipuncture, which is known to increase the incidence of complications, were not needed in the present cohort.

Venous hematomas due to multiple failed attempts to catheterize the vein were thus not seen in this series. These results are comparable with those achieved using US-guided techniques for IJV puncture.

The right IAV was the most frequently cannulated vein (55%), with most of the cannulations carried out during surgery, but no more attempts were needed when the left IAV was punctured. The median time from the start of puncture to aspiration of blood was 15 s (range 7 - 135 s). We experienced no arterial puncture and no pneumothorax in this series, even though this cohort represented



(a)



(b)

Figure 3. Puncture technique. (a) The needle punctures the IAV and progresses under direct vision to the lumen of the vein. Arrows, needle. (b) The guide-wire is inserted after removing the needle. Arrowheads, guide-wire.

Table 1. Demographic distribution of patients undergoing US-guided infraclavicular axillary vein cannulation.

Mean	Age	Weight	Height	Body Mass Index
	66.93 years	74.60 Kg	164.43 cm	27.56 Kg/cm ²
Standard Deviation	13.94 years	10.66 Kg	8.60 cm	3.12 Kg/m ²

*Total number of cases 120: 68 females and 52 males.

our learning curve for this technique.

4. Discussion

US-guided venous access has been described and widely recommended for IJV cannulation [11]. However, few studies have investigated US-guided SCV puncture, most of which have focused on paediatric venous cannulation [6] [7]. One paper reports the use of US to puncture the SCV via a supraclavicular approach with an endocavitary probe with good results [8], but we describe here a technique that uses a standard linear array probe to puncture the IAV, in close proximity to the SCV. The boundary between the two is defined by the edge of the first rib, so we believe that there are no clinically significant differences.

In previous studies, the venous approach was performed more laterally, even at the level of the mid-axillary vein, where mobility is greater, but fixation of the catheter is worse.

Only a few articles [12] [13] have reported on US-guided for axillary vein puncture. Two studies imaged both the vein and the needle transversely, which offers poorer needle visualization. Another paper [14] describes a more lateral approach to the axillary vein, where longitudinal visualization of both the vein and needle was possible. Our longitudinal in-line puncture technique offers a clear view of both the needle and the vein, which should produce consistently good results. The risk of accidental puncture of pleura or other structures (e.g., arteries) is lower, regardless of how deep the needle is, since the advancement of the needle, the vessel, and the surrounding structures can all be viewed in real time. Moreover, the place where the SCV passes over the first rib has been defined as a safe spot for its cannulation, since at this location, the first rib protects the lung from accidental puncture and the direction of the subclavian artery differs from that of the SCV, passing behind the anterior scalene muscle whereas the vein passes in front of it.

Abduction of the upper limb and the clavicle with it provides a US view of the infraclavicular vessels at this level, allowing safe puncture and cannulation.

Puncture time was measured in this study. The preparation time is known to be longer with US-guided techniques than with landmark-guided techniques. With experience, anatomical screening, and appropriate equipment preparation, the time should not exceed 5 min. Because the anatomical (vein position) and pathological (vein thrombosis) variations are now diagnosed by US, the time from skin puncture to guide-wire placement is reduced.

Furthermore, the very time-consuming vicious circle of multiple attempts, venous or arterial hematoma, failed puncture, and need to change to another central venous insertion site is probably minimized by US guidance.

The entire procedure is likely to be completed faster than when using the anatomical-landmark-based technique. It should also be noted that the procedure can be carried out during surgery because the abducted position of the upper extremities is common in the operating room, thus further reducing the time required. This is a clear advantage over the traditional external landmark technique where the adducted position of the upper extremity is required and forces the anestheti-

ologist to cannulate the IJV in the operating setting, associated with a higher incidence of infection and thrombosis [8] [9] [10].

Another advantage of US is the early detection of incorrect guide-wire catheterization or migration of the guide wire into the IJV. In our study, we experienced a single case of misplacement of the guide-wire, perhaps because the abduction of the upper limb directs the IAV toward the territory of the superior vena cava.

In a completely sterile setting, the assistance of a third hand is usually not needed because the probe can be left in the sterile field during maneuvers that require two hands, such as clavicle palpation for needle insertion or guide-wire advancement.

The use of US not only provides needle guidance but also makes it easy to check the patency of the IAV, regardless of whether the cases are hypovolemic patients whose veins have little filler, or are well hydrated (e.g., with engorged veins). Lumen vein in hypovolemic patients is very narrow, being very difficult to place the tip of the needle inside. When it is closed to the venous wall, a Valsalva maneuver can distend the vein and facilitate the puncture.

The learning curve of this approach, as for every US-guided technique, will probably be highly operator-dependant. Prior to the start of the study, each of the anaesthesiologists cannulated at least three IAV with this US-guided technique, to familiarize themselves with it. Then, during the study, each of the anesthesiologists performed this procedure in sixty patients. Both of them had previous experience in US-guided puncture techniques (regional anesthesia and CVC) and in IJV and SCV anatomical-landmark-based cannulation.

We consider that it takes a minimum of five cases to perform the procedure safely, with many more being needed in the absence of prior experience in managing US. For inexperienced clinicians, residents, or fellows, the US-guided IAV cannulation should be considered an advanced technique given the complexity and risk of complications with this approach.

In conclusion US-guided IAV cannulation can be performed by using a linear-array probe and ipsilaterally abducting the patient's upper limb at 90°. We propose an infraclavicular approach when performing this technique, since it was associated with a high success rate and no complications in this the present cohort. This procedure is safe and easy to learn for CVC, and we recommend this technique even in an early learning stage. Moreover, the procedure can be performed in an intraoperative setting.

Acknowledgements

We thank M. Sanz, MD, F. Barrios and M. Ayuso for their assistance with the study. This work was supported by the Department of Anesthesiology, University Hospital Príncipe de Asturias, Alcalá de Henares, Madrid, Spain.

References

- [1] Waldman, C.S. (2001) Use of Central Venous Catheters (CVC)—An Algorithm.

Care of the Critically Ill, **17**, 148-149.

- [2] Randolph, A.G., Cook, D.J., Gonzales, C.A. and Pribble, C.G. (1996) Ultrasound Guidance for Placement of Central Venous Catheters: A Meta-Analysis of the Literature. *Critical Care Medicine*, **24**, 2053-2058.
<https://doi.org/10.1097/00003246-199612000-00020>
- [3] Maslove, D. and Mihm, F. (2010) Ultrasound-Guided Internal Jugular Vein Cannulation. *The New England Journal of Medicine*, **363**, 796.
<https://doi.org/10.1056/NEJMc1006062>
- [4] Levitov, A.B., Aziz, S. and Slonim, A.D. (2009) Before We Go Too Far: Ultrasound-Guided Central Catheter Placement. *Critical Care Medicine*, **37**, 2473-2474.
<https://doi.org/10.1097/CCM.0b013e3181a9f694>
- [5] Barash, P. (2009) Ultrasound-Guided Central Venous Access. *F1000 Medicine Reports*, **1**, 65. <https://doi.org/10.3410/ml-65>
- [6] Hind, D., Calvert, N., McWilliams, R., et al. (2003) Ultrasonic Locating Devices for Central Venous Cannulation: Meta-Analysis. *BMJ*, **327**, 361.
<https://doi.org/10.1136/bmj.327.7411.361>
- [7] Theodoro, D., Bausano, B., Lewis, L., Evanoff, B. and Kollef, M. (2010) A Descriptive Comparison of Ultrasound-Guided Central Venous Cannulation of the Internal Jugular Vein to Landmark-Based Subclavian Vein Cannulation. *Academic Emergency Medicine*, **17**, 416-422. <https://doi.org/10.1111/j.1553-2712.2010.00703.x>
- [8] Mallin, M., Louis, H. and Madsen, T. (2010) A Novel Technique for Ultrasound-Guided Supraclavicular Subclavian Cannulation. *American Journal of Emergency Medicine*, **28**, 969-969.
- [9] McGee, D.C. and Gould, M.K. (2003) Preventing Complications of Central Venous Catheterization. *The New England Journal of Medicine*, **348**, 1123-1133.
<https://doi.org/10.1056/NEJMra011883>
- [10] Stone, M.B., Moon, C., Sutijono, D. and Blaivas, M. (2010) Needle Tip Visualization during Ultrasound-Guided Vascular Access: Short-Axis vs. Long-Axis Approach. *American Journal of Emergency Medicine*, **28**, 343-347.
- [11] Gualtieri, E., Deppe, S.A., Sipperly, M.E., et al. (1995) Subclavian Venous Catheterization: Greater Success Rate for Less Experienced Operators Using Ultrasound Guidance. *Critical Care Medicine*, **23**, 692.
<https://doi.org/10.1097/00003246-199504000-00018>
- [12] Sharma, A., Bodenham, A.R. and Mallick, A. (2004) Ultrasound-Guided Infraclavicular Axillary Vein Cannulation for Central Venous Access. *British Journal of Anaesthesia*, **93**, 188-192. <https://doi.org/10.1093/bja/ae187>
- [13] Sandhu, N.S. (2004) Transpectoral Ultrasound-Guided Catheterization of the Axillary Vein: An Alternative of Standard Catheterization of the Subclavian Vein. *Anesthesia & Analgesia*, **99**, 183-187.
<https://doi.org/10.1213/01.ANE.0000117283.09234.2C>
- [14] Stone, M.B., Nagdev, A., Murphy, M.C. and Sisson, C.A. (2010) Ultrasound Detection of Guidewire Position during Central Venous Catheterization. *American Journal of Emergency Medicine*, **28**, 82-84.

Treatment of Asthma in the Elderly: Questionnaire Survey in Japan

Sahoko Chiba¹, Kimitake Tsuchiya^{1*}, Tomoyuki Ogata², Reina Imase², Tamon Yagi², Yuka Mishima², Torahiko Jinta³, Kazuhito Saito⁴, Reiko Taki⁵, Susumu Isogai⁶, Yasuto Jinn⁷, Tsutomu Kawasaki⁸, Ichiro Natsume⁹, Yoshihiro Miyashita¹⁰, Jun Takagiwa¹¹, Nobuo Ishiwata¹², Tomoshige Chiaki¹³, Masato Kishi¹⁴, Yoshikazu Tsukada¹⁵, Motohisa Yamasaki¹⁶, Naohiko Inase¹

¹Department of Respiratory Medicine, Tokyo Medical and Dental University, Tokyo, Japan

²JA Toride Medical Center, Ibaraki, Japan

³St. Luke's International Hospital, Tokyo, Japan

⁴Tsuchiura Kyoudou General Hospital, Ibaraki, Japan

⁵Japanese Red Cross Musashino Hospital, Tokyo, Japan

⁶Ome Municipal General Hospital, Tokyo, Japan

⁷Hiratsuka Kyosai Hospital, Kanagawa, Japan

⁸Yokohama City Minato Red Cross Hospital, Kanagawa, Japan

⁹Yokosuka Kyosai Hospital, Kanagawa, Japan

¹⁰Yamanashi Prefectural Central Hospital, Yamanashi, Japan

¹¹Tokyo Kyosai Hospital, Tokyo, Japan

¹²Kudanzaka Hospital, Tokyo, Japan

¹³Hokushin General Hospital, Nagano, Japan

¹⁴Mishima General Hospital, Shizuoka, Japan

¹⁵Soka Municipal Hospital, Saitama, Japan

¹⁶Nitobe Memorial Nakano General Hospital, Tokyo, Japan

Email: *ktsuchiya2017@gmail.com

How to cite this paper: Chiba, S., Tsuchiya, K., Ogata, T., Imase, R., Yagi, T., Mishima, Y., Jinta, T., Saito, K., Taki, R., Isogai, S., Jinn, Y., Kawasaki, T., Natsume, I., Miyashita, Y., Takagiwa, J., Ishiwata, N., Chiaki, T., Kishi, M., Tsukada, Y., Yamasaki, M. and Inase, N. (2017) Treatment of Asthma in the Elderly: Questionnaire Survey in Japan. *International Journal of Clinical Medicine*, 8, 236-247.
<https://doi.org/10.4236/ijcm.2017.84023>

Received: March 19, 2017

Accepted: April 27, 2017

Published: April 30, 2017

Abstract

Introduction: The prevalence of asthma in the elderly has been increasing due to the aging of the global population. Appropriate treatment for asthma in the elderly is now a major issue, as the disease is often fatal and incurs high medical costs in the elderly population. There have been few recent reports on asthma treatment for the elderly in the real-world clinical settings. **Objectives:** This study was performed to assess how respiratory physicians manage asthma in elderly patients in clinical settings in Japan. **Methods:** Respiratory physicians in 16 Japanese hospitals responded to a questionnaire survey on asthma and COPD treatment between December 2014 and February 2015. The analysis was performed using data collected from medical records on 2041 asthma patients. **Results:** The mean patient age was 61.2 years, and 36.6% of the patients were men. In the breakdown by age, 1018 (49.9%) of the patients were elderly (≥ 65 years). Compared to the non-elderly, the elderly patients



had a significantly lower BMI, greater smoking history in pack-years, and poorer pulmonary function. There were no significant differences between the elderly and non-elderly in the prescription rates of common medications such as inhaled corticosteroids, long-acting beta-agonists (LABA) administered via inhaler or transdermal patch, long-acting muscarinic antagonists, or leukotriene receptor antagonists. In contrast, mucoactive drugs (18.7% vs. 12.3%, $P < 0.01$) and macrolides (7.9% vs. 4.0%, $P < 0.01$) were prescribed more frequently for the elderly than for the non-elderly. The proportion of patients receiving transdermal LABA was higher in the elderly than in the non-elderly (4.7% vs. 2.4%, $P = 0.02$). **Conclusions:** According to this survey, the prescription rates of mucoactive drugs, macrolides, and transdermal LABA were significantly higher in the elderly than in the non-elderly.

Keywords

Asthma, Elderly, Transdermal LABA, Aging

1. Introduction

The prevalence of asthma among older adults has been reported to range from 2.5% to 7.0% in Europe and the United states [1] [2] [3] and is predicted to continue increasing in the future as the global population ages [4]. Asthma in the elderly requires urgent attention in view of the higher mortality rates, higher costs for hospitalization and medication, and poorer quality of life elderly asthmatics endure compared to younger adults with the disease [5] [6].

Elderly patients with asthma are more likely to be under diagnosed and undertreated [7], partly because the pathophysiology of asthma in the elderly becomes more complex with age-related changes such as loss of lung function [8], alterations in immune function such as elevated basal levels of inflammation and reduced innate and adaptive responses [9], and increasing comorbidities [10]. Long-term cigarette smoking might modify the pathophysiology of asthma in the elderly. Tobacco smoking exposure and aging have been identified as risk factors for the development of asthma-chronic obstructive pulmonary disease (COPD) overlap syndrome (ACOS), a condition characterized by partly irreversible airflow limitation, neutrophilic airway inflammation, and airway remodeling [11].

Japan currently has the world's oldest population. The elderly (65 years or older) accounted for 26.6% of the Japanese population in 2015 and are forecasted to account for about 40% by 2050 [12]. Accordingly, the proportion of adult asthma patients aged 65 and over has increased from 36.7% in 1996 to 41.7% in 2014 [13]. While the total mortality from asthma has gradually decreased, the elderly (65 years or older) account for a growing percentage of asthma deaths in Japan. As of 2013, almost 90% of the patients who died from asthma were elderly [14]. While the appropriate treatment to reduce asthma mortality in the elderly is crucially needed, the treatments for the elderly some-

times diverge from the current guidelines because of conditions such as inspiratory flow limitation, poor inhaler technique, cognitive impairment, and comorbidities [15] [16]. Drug-drug interactions are another particular concern in the elderly, as well as adverse drug effects induced by dysfunctions of the liver and kidney [17]. Elderly patients have also been excluded from many of the clinical trials [4], which limits the available data on asthma treatment strategies for them.

In this study, we aimed to assess how respiratory physicians manage asthma in the elderly in real-world clinical settings in Japan.

2. Materials and Methods

2.1. Study Design and Subjects

This is a cross-sectional study based on data collected from a questionnaire survey filled out by respiratory physicians on the asthma and COPD treatment they administered in Tokyo Medical and Dental University and 15 affiliated hospitals (JA Toride Medical Center, St. Luke's International Hospital, Tsuchiura Kyoudou General Hospital, Japanese Red Cross Musashino Hospital, Ome Municipal General Hospital, Hiratsuka Kyosai Hospital, Yokohama City Minato Red Cross Hospital, Yokosuka Kyosai Hospital, Yamanashi Prefectural Central Hospital, Tokyo Kyosai Hospital, Kudanzaka Hospital, Hokushin General Hospital, Mishima General Hospital, Soka Municipal Hospital, Nitobe Memorial Nakano General Hospital) between December 2014 and February 2015. The inclusion criteria for the patients covered by the survey were: 1) 20 years of age or older, 2) a physician diagnosis of asthma or COPD, 3) regular follow-up on an outpatient basis for more than 3 months before study enrollment, and 4) agreement to participate in the survey. All participants provided written consent. Physicians filled out the questionnaire on the treatments they administered for each patient, including medications, home oxygen therapy, and pulmonary rehabilitation. Data on age, sex, body mass index (BMI), smoking status, pulmonary function test results, symptoms of asthma, the modified Medical Research Council (mMRC) scale, COPD assessment test (CAT) score, and hospitalization for exacerbation in the previous year were also collected from the medical records. Patients were divided into two groups: the elderly group aged 65 and over and the non-elderly group aged less than 65 years old.

This study was approved by the Medical Research Ethics Committee of Tokyo Medical and Dental University (approval date: October 10, 2014; Approval #1883) and by the institutional review boards of the participating hospitals.

2.2. Statistical Analysis

Statistical analyses were performed using GraphPad Prism 5 software (GraphPad, California, USA). Continuous variables were summarized as means and standard deviations. Categorical data were summarized as numbers and percentages. Denominators varied according to missing responses. The Student's t-test and Chi-square test were applied for comparisons between two groups. A *P* value of

less than 0.05 was regarded as statistically significant.

3. Results

3.1. Patient Characteristics

Data on 3426 patients from 16 institutes were collected and the 76 respiratory physicians practicing at the institutes answered the questionnaire. Out of 2466 patients with identified asthma, 21 patients with incomplete demographic information (sex, age) and 404 ACOS patients diagnosed with both asthma and COPD were excluded. The remaining 2,041 patients were used for the study. The patients in this population had a mean age of 61.2 years. In total, 747 (36.6%) of the patients were males, 648 (36.9%) had a smoking history (25.7 ± 25.6 pack-years), 1018 (49.9%) were 65 years old or older, and 1023 (50.1%) were under 65 years old. **Table 1** compares the patient characteristics between those aged 65 and over (elderly) and less than 65 (non-elderly). The mean ages of the elderly and non-elderly were 74.4 and 47.8 years, respectively. The elderly group had a significantly lower BMI, lower percentage of current smokers, and poorer pulmonary function than the non-elderly group.

Table 1. Patient characteristics.

	Elderly (≥ 65 years)	Non-elderly (< 65 years)	<i>P</i>
Total number	1018	1023	
Age, years	74.4 ± 9.7	47.8 ± 11.2	< 0.01
Age group, n (%)			
<45 years		371 (36.2)	
45 - 54 years		324 (31.7)	
55 - 64 years		328 (32.1)	
65 - 74 years	553 (54.3)		
75 - 84 years	384 (37.7)		
≥ 85 years	81 (8.0)		
Male, n (%)	374 (36.7)	373 (36.5)	0.89
BMI, kg/m ²	23.4 ± 3.8	24.3 ± 5.1	< 0.01
Smoking status, n (%)			< 0.01
Known	879	877	
Never	569 (64.7)	539 (61.5)	
Former	291 (33.1)	255 (29.1)	
Current	19 (2.2)	83 (9.5)	
Smoking amount, pack-years	34.2 ± 30.6	17.9 ± 16.6	< 0.01
Pulmonary function test			
VC, % predicted	94.9 ± 18.1	101.6 ± 15.6	< 0.01
FVC, % predicted	92.7 ± 18.4	101.6 ± 15.6	< 0.01
FEV ₁ , % predicted	83.0 ± 21.7	89.9 ± 19.0	< 0.01
FEV ₁ /FVC (%)	69.1 ± 11.9	75.5 ± 11.8	< 0.01

Data are given as the mean \pm SD unless otherwise indicated. For smoking status, percentages were calculated based on the number of known patients. BMI, body mass index; VC, vital capacity; FVC, forced vital capacity; FEV₁, forced expiratory volume in one second.

3.2. Details of Treatment

In the questionnaire survey, the respiratory physicians provided details on the treatments the patients received. **Figure 1** compares the medications received by the elderly and non-elderly. The treatments administered in the elderly and non-elderly patients were as follows: inhaled corticosteroids (ICS) in 96.0% and 97.0%, long-acting beta-agonists (LABA, inhaler or transdermal patch) in 71.9% and 75.5%, long-acting muscarinic antagonists (LAMA) in 3.9% and 4.9%, and leukotriene receptor antagonists (LTRA) in 46.4% and 50.3%, respectively. There were no significant differences between the two groups in the prescription rates of ICS, LABA, LAMA, LTRA, theophylline, oral corticosteroids, or omalizumab. The elderly received anti-allergic drugs other than LTRA (antihistamines, Th2 cytokine inhibitors, thromboxane A2 receptor antagonists) less frequently than the non-elderly (8.0% vs. 10.7%, $P = 0.04$). Mucoactive drugs, namely, mucoregulators and expectorants (18.7% vs. 12.3%, $P < 0.01$) and macrolides (7.9% vs. 4.0%, $P < 0.01$), were prescribed significantly more frequently for the elderly than for the non-elderly. Four elderly and six non-elderly patients received traditional Japanese herbal medicine (kampo), 4 elderly patients and 1 non-elderly patient received home oxygen therapy, and 1 elderly patient underwent pulmonary rehabilitation.

3.3. Drug Delivery Devices

The types of preferred drug delivery devices prescribed for the elderly were also analyzed. Patients using both types of device were doubly counted. **Table 2** shows the results. Among patients receiving LABA, the proportion receiving

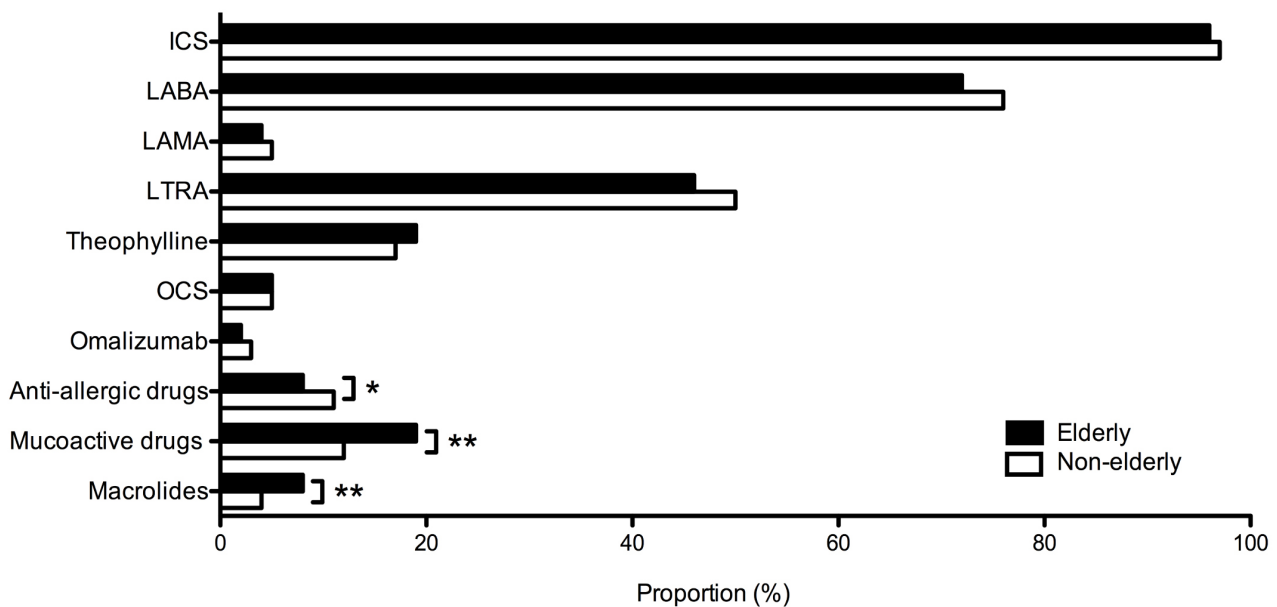


Figure 1. Treatment prescribed by respiratory physicians for elderly (black columns) and non-elderly (white columns) patients with asthma. ICS, inhaled corticosteroids; LABA, inhaled or transdermal long-acting beta-agonists; LAMA, long-acting muscarinic antagonists; LTRA, leukotriene receptor antagonists; OCS, oral corticosteroids. Mucoactive drugs include mucoregulators and expectorants. * $P < 0.05$, ** $P < 0.01$.

Table 2. Drug delivery devices prescribed for the elderly and the non-elderly.

	Elderly (≥65 years) (n = 1018)	Non-elderly (<65 years) (n = 1023)	<i>P</i>
LABA, n (%)			0.02
Transdermal LABA	35 (4.7)	19 (2.4)	
Inhaled LABA	709 (95.3)	760 (97.6)	
ICS or ICS/LABA, n (%)			0.75
PMDI	147 (14.9)	159 (15.5)	
DPI	837 (85.1)	864 (84.5)	
ICS + LABA, n (%)			1.0
Combination	696 (96.0)	745 (97.4)	
Separation	29 (4.0)	20 (2.6)	

Patients using both types were doubly counted. LABA, long-acting beta-agonists; ICS, inhaled corticosteroids; pMDI, pressurized metered-dose inhaler; DPI, dry powder inhaler.

transdermal LABA was significantly higher in the elderly than in the non-elderly (4.7% vs. 2.4%, $P = 0.02$). Among patients receiving ICS or ICS/LABA combinations, the proportion of patients using pressurized metered-dose inhalers (pMDIs) did not differ between the elderly and non-elderly (14.9% vs. 15.5%). Among patients receiving both ICS and LABA, the proportion of patients receiving ICS/LABA combinations did not significantly differ between the elderly and non-elderly (96.0% vs. 97.4%).

3.4. Asthma Symptoms and the mMRC Scale

We analyzed the survey data on the patients' asthma symptoms and the mMRC scale. **Figure 2(a)** shows the existence and frequency of asthma symptoms in the elderly and non-elderly. The proportion of asymptomatic patients was significantly higher in the elderly than in the non-elderly (635/974 [65.2%] vs 544/1000 [54.4%], $P < 0.01$).

As **Figure 2(b)** shows, the proportion of patients scoring 0 on the mMRC scale was significantly lower in the elderly than in the non-elderly (439/704 [62.4%] vs. 472/605 [78.0%], $P < 0.01$).

3.5. Hospitalizations for Exacerbation in the Previous Year

We analyzed the survey data on hospitalizations due to asthma exacerbation. The proportion of patients who had been hospitalized in the previous year did not differ between the elderly and non-elderly (54/974 [5.5%] vs. 56/992 [5.6%]). When we performed a further analysis disregarding age, however, a significantly higher proportion of patients receiving mucoactive drugs or macrolides had been hospitalized in the previous year compared to patients not receiving them (10.1% vs. 4.8%, $P < 0.01$; 19.8% vs. 4.8%, $P < 0.01$; respectively).

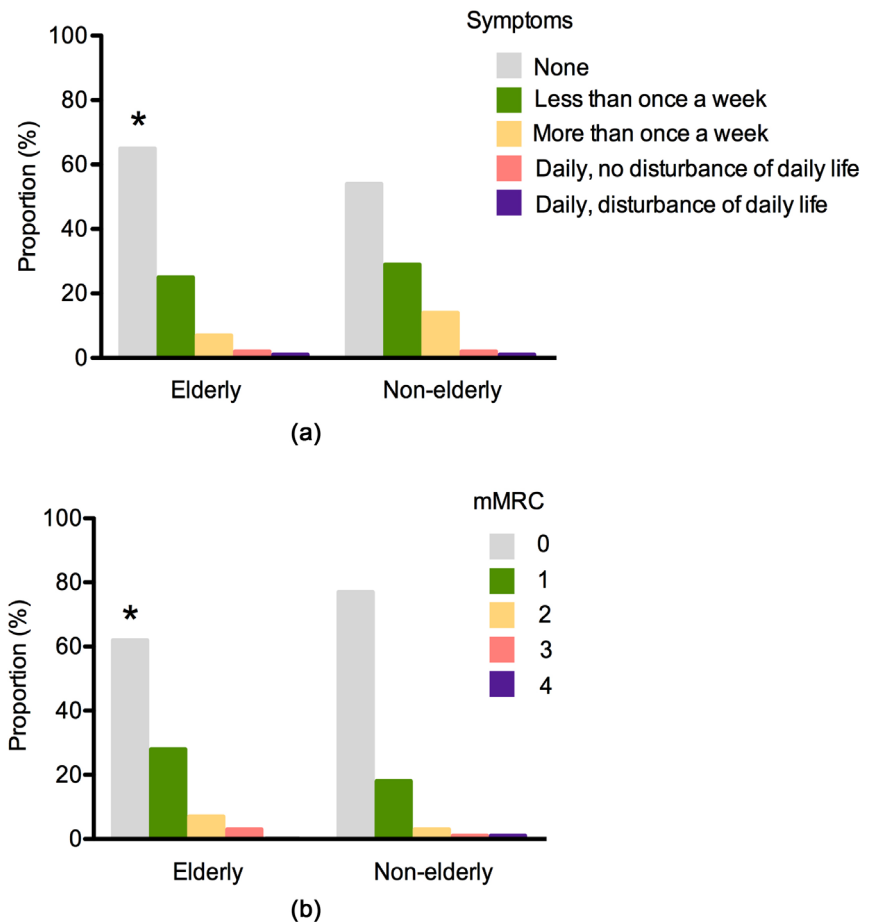


Figure 2. (a) The frequency of asthma symptoms. The respective columns show the proportions of patients with no symptoms (gray), symptoms less than once a week (green), symptoms more than once a week (yellow), daily symptoms with no disturbance of daily life (red), daily symptoms with disturbance of daily life (purple); $n = 974$ in the elderly, $n = 1000$ in the non-elderly. (b) The modified Medical Research Council (mMRC) scale. The respective columns show the proportions of patients with mMRC scale 0 (gray), 1 (green), 2 (yellow), 3 (red), and 4 (purple); $n = 704$ in the elderly, $n = 605$ in the non-elderly. * $P < 0.01$ compared to the non-elderly.

4. Discussion

According to the questionnaire survey on treatments administered to adult patients with asthma in Japan, the prescription rates of mucoactive drugs, macrolides, and transdermal LABA were significantly higher in the elderly than in the non-elderly. There were no significant differences in the prescription rates of ICS, LABA (inhaler or transdermal patch), LAMA, or LTRA between the same two groups.

Although asthma in the elderly has been commonly recognized as undertreated [7], one recent study has shown that the elderly are often prescribed ICS and receive relatively aggressive care compared to younger patients [18]. Similarly, the present study found no significant differences between the elderly and non-elderly in the prescription rates of major controller medications such as ICS, LABA, LAMA, or LTRA. Neither the Global Initiative for Asthma (GINA)

2016 nor the guideline from the Japanese Society of Allergology in 2015 makes any recommendations on the use of mucoactive drugs or macrolides for asthmatic patients [14] [19]. Some of the patients in this study, however, received these medications in clinical settings in Japan. The proportion of patients who had been hospitalized in the previous year was significantly higher among the patients receiving mucoactive drugs or macrolides than among those not receiving them. We assumed, therefore, that the respiratory physicians in our study considered these medications as treatment options for asthma. Indeed, a real-world investigation in Italy recently reported that macrolides influenced the reduction of severe asthma exacerbations [20]. Several clinical trials and animal experiments have demonstrated that mucoactive drugs can prevent airway hyperresponsiveness [21] [22] [23]. Another possible reason for the higher prescription rates of mucoactive drugs or macrolides for the elderly in our study was the convenience of administering these medications regardless of low inspiratory flow rates or poor inhaler technique.

On the question of drug delivery, previous studies reported that transdermal LABA was effective in improving asthma control and health status [24] [25], and that elderly patients adhere to transdermal LABA more faithfully than to inhaled LABA [26]. The physicians surveyed in our study prescribed transdermal LABA more frequently for the elderly than for the non-elderly, possibly because they recognized these benefits.

Underreporting of subjective symptoms is considered an important issue in elderly asthmatics, given the portended risk of treatment delay [27]. The elderly have been shown to be less aware of their own symptoms of bronchoconstriction [28]. Similarly, our study identified a significantly higher proportion of asymptomatic patients among the elderly. Several possible explanations for this finding are available: the elderly might be less aware of their symptoms or less likely to report them; physicians might be less reliable in recognizing asthma symptoms in the elderly; asthma in the elderly might actually be well controlled. In either case, physicians should carefully monitor their patients and use objective measures of asthma control, especially for asthma in the elderly.

Dyspnea, a common symptom in the elderly, is mainly caused by respiratory disease, cardiovascular disease, deconditioning, and respiratory muscle weakness [29]. While the proportion of patients complaining of dyspnea in our study was significantly higher in the elderly than in the non-elderly, we could not tell whether any comorbidities were affecting their symptoms. Further surveys will be required to accurately identify the causes of their dyspnea.

Hospitalizations for asthma are reported to be more common in older adults than in younger adults [27] [30]. On the contrary, there was no significant difference in the proportion of hospitalizations due to asthma exacerbation between the elderly and non-elderly in our study. This might be explained by the exclusion of ACOS patients, a population significantly older and at greater risk of hospitalizations than patients with asthma alone [31] [32], from our analysis. When we included 404 patients with ACOS in the analysis, the proportion of

hospitalizations in the previous year became significantly higher in the elderly than in the non-elderly (8.0% vs. 5.7%, $P = 0.03$).

Our study was subject to two important limitations. First, we used cross-sectional data for the analyses. Second, the questionnaire targeted not patients, but physicians, who may have had an incomplete understanding of the patients' subjective symptoms or their adherence to the treatments prescribed. We assume that our study was meaningful in spite of these limitations, as it was conducted on a large population of elderly patients and faithfully reflected their management in real-world clinical settings at multiple institutions.

In conclusion, mucoactive drugs, macrolides, and transdermal LABA were more likely to be prescribed for the elderly asthmatic patients than for the non-elderly asthmatics, whereas the prescription rates of major controller medications such as ICS, LABA (inhaler or transdermal patch), LAMA, or LTRA did not differ by age.

References

- [1] Oraka, E., Kim, H.J., King, M.E. and Callahan, D.B. (2012) Asthma Prevalence among US Elderly by Age Groups: Age Still Matters. *Journal of Asthma*, **49**, 593-599. <https://doi.org/10.3109/02770903.2012.684252>
- [2] Arif, A.A., Rohrer, J.E. and Delclos, G.L. (2005) A Population-Based Study of Asthma, Quality of Life, and Occupation among Elderly Hispanic and Non-Hispanic Whites: A Cross-Sectional Investigation. *BMC Public Health*, **5**, 97. <https://doi.org/10.1186/1471-2458-5-97>
- [3] Nejjarı, C., Tessier, J.F., Letenneur, L., Dartigues, J.F., Barberger-Gateau, P. and Salamon, R. (1996) Prevalence of Self-Reported Asthma Symptoms in a French Elderly Sample. *Respiratory Medicine*, **90**, 401-408. [https://doi.org/10.1016/S0954-6111\(96\)90113-4](https://doi.org/10.1016/S0954-6111(96)90113-4)
- [4] Yáñez, A., Cho, S.H., Soriano, J.B., Rosenwasser, L.J., Rodrigo, G.J., Rabe, K.F., Peters, S., Niimi, A., Ledford, D.K., Katial, R., Fabbri, L.M., Celedón, J.C., Canonica, G.W., Busse, P., Boulet, L.P., Baena-Cagnani, C.E., Hamid, Q., Bachert, C., Pawankar, R. and Holgate, S.T. (2014) Asthma in the Elderly: What We Know and What We Have Yet To Know. *World Allergy Organization Journal*, **7**, 8. <https://doi.org/10.1186/1939-4551-7-8>
- [5] Moorman, J.E. and Mannino, D.M. (2001) Increasing U.S. Asthma Mortality Rates: Who Is Really Dying? *Journal of Asthma*, **38**, 65-71. <https://doi.org/10.1081/JAS-100000023>
- [6] Plaza, V., Serra-Batlles, J., Ferrer, M. and Morejón, E. (2000) Quality of Life and Economic Features in Elderly Asthmatics. *Respiration*, **67**, 65-70. <https://doi.org/10.1159/000029465>
- [7] Enright, P.L., McClelland, R.L., Newman, A.B., Gottlieb, D.J. and Lebowitz, M.D. (1999) Underdiagnosis and Undertreatment of Asthma in the Elderly. *Chest*, **116**, 603-613.
- [8] Janssens, J.P., Pache, J.C. and Nicod, L.P. (1999) Physiological Changes in Respiratory Function Associated with Ageing. *European Respiratory Journal*, **13**, 197-205.
- [9] Lowery, E.M., Brubaker, A.L., Kuhlmann, E. and Kovacs, E.J. (2013) The Aging Lung. *Clinical Interventions in Aging*, **8**, 1489-1496.
- [10] Barnett, K., Mercer, S.W., Norbury, M., Watt, G., Wyke, S. and Guthrie, B. (2012)

- Epidemiology of Multimorbidity and Implications for Health Care, Research, and Medical Education: A Cross-Sectional Study. *The Lancet*, **380**, 37-43.
[https://doi.org/10.1016/S0140-6736\(12\)60240-2](https://doi.org/10.1016/S0140-6736(12)60240-2)
- [11] Gibson, P.G. and Simpson, J.L. (2009) The Overlap Syndrome of Asthma and COPD: What Are Its Features and How Important Is It? *Thorax*, **64**, 728-735.
<https://doi.org/10.1136/thx.2008.108027>
- [12] Kowal, P., Goodkind, D. and He, W. (2016) An Aging World: 2015, International Population Reports. U.S. Government Printing Office, Washington DC.
<http://www.census.gov/library/publications/2016/demo/P95-16-1.html>
- [13] Portal Site of Official Statistics of Japan (e-Stat). Patient Survey.
<http://www.e-stat.go.jp/SG1/estat/eStatTopPortal.do>
- [14] Japanese Society of Allergology, Asthma Guideline Committee (2015) Asthma Prevention and Management Guidelines 2015. Kyowa Kikaku, Tokyo.
- [15] Boulet, L.P. (2016) Asthma in the Elderly Patient. *Asthma Research and Practice*, **2**, 3. <https://doi.org/10.1186/s40733-015-0015-1>
- [16] Melani, A.S. (2013) Management of Asthma in the Elderly Patient. *Clinical Interventions in Aging*, **8**, 913-922. <https://doi.org/10.2147/CIA.S33609>
- [17] Battaglia, S., Benfante, A., Spatafora, M. and Scichilone, N. (2016) Asthma in the Elderly: A Different Disease? *Breathe*, **12**, 18-28.
<https://doi.org/10.1183/20734735.002816>
- [18] Slavin, R.G., Haselkorn, T., Lee, J.H., Zheng, B., Deniz, Y. and Wenzel, S.E., TENOR Study Group (2006) Asthma in Older Adults: Observations from the Epidemiology and Natural History of Asthma: Outcomes and Treatment Regimens (TENOR) Study. *Annals of Allergy, Asthma & Immunology*, **96**, 406-414.
[https://doi.org/10.1016/S1081-1206\(10\)60907-6](https://doi.org/10.1016/S1081-1206(10)60907-6)
- [19] Global Initiative for Asthma (GINA) (2016) Global Strategy for Asthma Management and Prevention 2016. ginaasthma.org
- [20] Arfè, A., Blasi, F., Merlino, L. and Corrao, G. (2016) Respiratory Drugs and Macrolides Prevent Asthma Exacerbations: A Real-World Investigation. *Respiratory Medicine*, **119**, 7-12. <https://doi.org/10.1016/j.rmed.2016.05.004>
- [21] Takeda, K., Miyahara, N., Matsubara, S., Taube, C., Kitamura, K., Hirano, A., Tanimoto, M. and Gelfand, E.W. (2016) Immunomodulatory Effects of Ambroxol on Airway Hyperresponsiveness and Inflammation. *Immune Network*, **16**, 165-175.
<https://doi.org/10.4110/in.2016.16.3.165>
- [22] Ueno-Iio, T., Shibakura, M., Iio, K., Tanimoto, Y., Kanehiro, A., Tanimoto, M. and Kataoka, M. (2013) Effect of Fudosteine, a Cysteine Derivative, on Airway Hyperresponsiveness, Inflammation, and Remodeling in a Murine Model of Asthma. *Life Sciences*, **92**, 1015-1023.
- [23] Ishiura, Y., Fujimura, M., Yamamori, C., Nobata, K., Myou, S., Kurashima, K., Michishita, Y. and Takegoshi, T. (2003) Effect of Carbocysteine on Cough Reflex to Capsaicin in Asthmatic Patients. *British Journal of Clinical Pharmacology*, **55**, 504-510. <https://doi.org/10.1046/j.1365-2125.2003.01788.x>
- [24] Nishiyama, O., Taniguchi, H., Kondoh, Y., Kimura, T., Kato, K., Kume, H. and Shimokata, K. (2006) Comparison of the Effects of Tulobuterol Patch and Salmeterol in Moderate to Severe Asthma. *Clinical and Experimental Pharmacology and Physiology*, **33**, 1016-1021. <https://doi.org/10.1111/j.1440-1681.2006.04480.x>
- [25] Inoue, H., Niimi, A., Matsumoto, H., Ito, I., Oguma, T., Otsuka, K., Takeda, T., Nakaji, H., Tajiri, T., Iwata, T., Nagasaki, T. and Mishima, M. (2017) A 12-Week, Randomized, Parallel-Group, Proof-of-Concept Study of Tulobuterol Patch and

Salmeterol Inhaler as Add-On Therapy in Adult-Onset Mild-to-Moderate Asthma. *Clinical and Experimental Pharmacology and Physiology*, **44**, 21-29.

<https://doi.org/10.1111/1440-1681.12683>

- [26] Mochizuki, H., Nanjo, Y. and Takahashi, H. (2013) Better Adherence to a Transdermal Tulobuterol Patch than Inhaled Salmeterol in Elderly Chronic Obstructive Pulmonary Disease Patients. *Geriatrics & Gerontology International*, **13**, 398-404. <https://doi.org/10.1111/j.1447-0594.2012.00916.x>
- [27] Hanania, N.A., King, M.J., Braman, S.S., Saltoun, C., Wise, R.A., Enright, P., Falsey, A.R., Mathur, S.K., Ramsdell, J.W., Rogers, L., Stempel, D.A., Lima, J.J., Fish, J.E., Wilson, S.R., Boyd, C., Patel, K.V., Irvin, C.G., Yawn, B.P., Halm, E.A., Wasserman, S.I., Sands, M.F., Ershler, W.B. and Ledford, D.K., Asthma in Elderly Workshop Participants (2011) Asthma in the Elderly: Current Understanding and Future Research Needs—A Report of a National Institute on Aging (NIA) Workshop. *The Journal of Allergy and Clinical Immunology*, **128**, S4-S24. <https://doi.org/10.1016/j.jaci.2011.06.048>
- [28] Connolly, M.J., Crowley, J.J., Charan, N.B., Nielson, C.P. and Vestal, R.E. (1992) Reduced Subjective Awareness of Bronchoconstriction Provoked by Methacholine in Elderly Asthmatic and Normal Subjects as Measured on a Simple Awareness Scale. *Thorax*, **47**, 410-413. <https://doi.org/10.1136/thx.47.6.410>
- [29] Silvestri, G.A. and Mahler, D.A. (1993) Evaluation of Dyspnea in the Elderly Patient. *Clinics in Chest Medicine*, **14**, 393-404.
- [30] Tsai, C.L., Delclos, G.L., Huang, J.S., Hanania, N.A. and Camargo Jr., C.A. (2013) Age-Related Differences in Asthma Outcomes in the United States, 1988-2006. *Annals of Allergy, Asthma & Immunology*, **110**, 240-246. <https://doi.org/10.1016/j.anai.2013.01.002>
- [31] Menezes, A.M., Montes de Oca, M., Pérez-Padilla, R., Nadeau, G., Wehrmeister, F.C., Lopez-Varela, M.V., Muiño, A., Jardim, J.R., Valdivia, G. and Tálamo, C., PLATINO Team (2014) Increased Risk of Exacerbation and Hospitalization in Subjects with an Overlap Phenotype: COPD-Asthma. *Chest*, **145**, 297-304.
- [32] Nielsen, M., Bårnes, C.B. and Ulrik, C.S. (2015) Clinical Characteristics of the Asthma-COPD Overlap Syndrome—A Systematic Review. *International Journal of Chronic Obstructive Pulmonary Disease*, **10**, 1443-1454.

Appendix: Survey Questionnaire

Date: //

Asthma Previously diagnosed asthma (in remission) COPD

Age: _____

Sex: Male/Female

Smoking status: Current/Ex/Never/Unknown, ___ cigarettes per day ×_years

BMI: _____

GOLD classification of severity of airflow limitation in COPD: I II III

IV Unknown

Symptoms of asthma:

Absence

Presence: Less than once a week/More than once a week/

Daily, no disturbance of daily life/Daily, disturbance of daily life

Unknown

mMRC: 0 1 2 3 4 Unknown

CAT: _____ Unknown

Pulmonary function test:

%VC _____% %DLCO _____%

%FVC _____% %DLCO/VA _____%

%FEV1 _____% RV/TLC (%) _____%

FEV1/FVC (%) _____%

Treatment:

ICS

LABA:

ICS/LABA:

LAMA:

LABA/LAMA:

SABA SAMA

LTRA Theophylline

Traditional Japanese herbal medicine (kampo)

Omalizumab Oral corticosteroids

Macrolides Mucoactive drugs

Anti-allergic drugs

Home oxygen therapy

Pulmonary rehabilitation

COPD exacerbation in the previous year:

Hospitalization for COPD exacerbation in the previous year:

Hospitalization for asthma exacerbation in the previous year:

Causes of Hospital Readmissions at the Community Level

Ronald Lagoe^{1*}, Barbara Drapola², Diane Nanno³, Shelly Littau¹

¹Hospital Executive Council, Syracuse, NY, USA

²Crouse Hospital, Syracuse, NY, USA

³State University of New York Upstate University Hospital, Syracuse, NY, USA

Email: *Hospexcl@cnyemail.com

How to cite this paper: Lagoe, R., Drapola, B., Nanno, D. and Littau, S. (2017) Causes of Hospital Readmissions at the Community Level. *International Journal of Clinical Medicine*, 8, 248-256.

<https://doi.org/10.4236/ijcm.2017.84024>

Received: March 29, 2017

Accepted: April 27, 2017

Published: April 30, 2017

Copyright © 2017 by authors and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Reducing inpatient hospital readmissions has been an important component of efforts to improve outcomes and reduce health care costs. This study focused on evaluation of the clinical causes of hospital readmissions of adult medical/surgical patients within 30 days between October 2015 and September 2016. It was based on the principal diagnoses of readmissions, a definition that is used throughout the health care industry in the United States. The study focused on adult medicine and adult surgery readmissions in Syracuse, New York, a small metropolitan area, during a twelve month period. It included almost 4000 individual readmissions. The study data demonstrated that only about 22 percent of inpatient readmissions were for the same diagnoses as the initial admissions that preceded them. The study data also indicated that another 20 percent of hospital readmissions involved a diagnosis different from that of the initial admission but in the same body system. Most importantly, the study demonstrated that a consistent majority of inpatient readmissions were caused by diagnoses in different body systems than the initial. The data suggested that efforts to address the causes of hospital readmissions should be based on management of a broad range of adult medicine conditions, rather than individual diagnoses.

Keywords

Hospital Readmissions, Hospitalization, Hospital Outcomes

1. Introduction

Historically, improving the efficiency of health care has been a major concern in the United States. This subject has gained increased attention with efforts by the new administration in Washington to contain the costs of Medicaid and Medi-

care. Both of these major payers could be addressed with limitations in federal funding [1] [2] [3].

In recent years, a recognition has developed that improvements in the efficiency and outcomes of care are linked. This recognition has stimulated the development of efforts to reduce adverse outcomes and related costs. Because of their high costs, the reduction of hospital readmissions has become an important focus of these efforts [4] [5] [6].

These initiatives have included the development of studies of factors related to readmissions. Researchers have developed models of readmissions that can predict these outcomes. These studies have produced much useful information, but have failed to develop models that can predict readmissions with a high degree of accuracy [7] [8].

These studies have substantially increased understanding of hospital inpatient readmissions. They have been supported by the development of computer tools that address these outcomes [9].

Through all of this research, one of the most important aspects of this subject has been the clinical causes of hospital readmissions. These causes involve broad ranges of diagnoses rather than individual conditions. Definition and understanding of them appear to be essential to progress in improving these outcomes [10].

2. Population

This study evaluated causes of inpatient readmissions within 30 days of the initial admission in the metropolitan area of Syracuse, New York. This area includes three large acute care facilities, Crouse Hospital (19,478 inpatient discharges excluding well newborns, 2016), St. Joseph's Hospital Health Center (25,101 discharges, 2016), and the State University of New York Upstate University Hospital (29,427 discharges, 2016). These hospitals have provided primary and secondary acute care to an immediate service area with a population of approximately 600,000 and tertiary services to the 11 county Central New York Health Service Area with a population of 1,400,000.

Historically, the Syracuse hospitals have maintained a relatively low inpatient admission rate, despite demographics that may contribute to increased readmission rates among disadvantaged populations. This rate has been comparable to those of metropolitan areas such as Rochester and Albany, New York that have higher managed care penetration [11].

The Syracuse hospitals have worked cooperatively to improve the efficiency and outcomes of care in the community through the Hospital Executive Council. These efforts have included the reduction of hospital lengths of stay and readmissions, as well as the development of subacute and complex care programs aimed at supporting efficient transitions of care for difficult to place patients. The readmissions program has been carried out in cooperation with 3M™ Health Information Systems.

3. Method

This study evaluated clinical causes of inpatient readmissions in the hospitals of Syracuse, New York during a twelve month period. Economic and social determinants of health as potential causes of readmissions were not examined. It included more than 4000 individual adult medicine and adult surgery readmissions, 82.8 percent of the total, in the area's three acute hospitals [11]. It was based on simple descriptive statistics.

The study was carried out using patient specific data from each of the hospitals by the Hospital Executive Council. These data were obtained through Business Associate Agreements with each of the hospitals. The Council functions as a mechanism for the development of multihospital studies in the Syracuse metropolitan area.

Hospital readmissions were identified using the Potentially Preventable Readmissions system developed by 3M™ Health Information Systems. This software uses hospital administrative data to identify readmissions within 30 days of the initial admission and a number of clinical and demographic indicators for each patient.

Readmissions were identified for adult medicine and adult surgery patients using the All Patients Refined Diagnosis Related Group System (APR DRG). This system identifies the hospital service of each inpatient based on the principal diagnosis, secondary diagnoses, principal procedure, and other clinical and demographic characteristics.

For purposes of this study, the clinical cause of each inpatient readmission was identified as the All Patients Refined Diagnosis Related Group. This indicator is based on the principal diagnosis or principal procedure of the inpatient stay. The principal diagnosis is the condition, which in the opinion of the discharge abstractor, was the principal cause of the admission. The analysis also included Major Diagnostic Categories (MDCs) which are collections of APR DRGs by anatomical areas.

The first component of the analysis focused on clinical causes of inpatient adult medicine and adult surgery readmissions for the period October 2015-September 2016. This was the latest time interval for which complete data were available.

Each of the readmissions was identified as one of three categories. The first was a return in the same APR DRG as the initial admission, such as a Chronic Obstructive Pulmonary Disease (COPD) patient returning for COPD. The second was a return in the same MDC as the initial admission but a different APR DRG, such as a COPD patient returning for pneumonia. The third category was a return in a different MDC than the initial admission, such as a COPD patient returning for a digestive disorder.

Numbers of readmissions were identified for each of the three categories by hospital and total. The data were generated for adult medicine and adult surgery readmissions for October-December 2015, January-March 2016, April-June 2016, and July-September 2016. Differences in numbers of readmissions and percen-

tages of the adult medicine and adult surgery total among the three categories and for the combined population were identified.

The second component of the analysis focused on clinical causes of inpatient readmissions in the Syracuse hospitals for the third category, those who returned with a Major Diagnostic Category outside the MDC of the Initial Admission. These data were aggregated for each of the three month periods by MDC for the combined hospitals. Differences in numbers of readmissions by MDC were compared.

4. Results

The initial component of the study focused on identification of the clinical causes of a full range of readmissions for adult medicine and adult surgery in the Syracuse hospitals. The remaining readmissions were produced by obstetrics, pediatrics, and mental health services. Related data are summarized in **Table 1**.

Table 1. Potentially preventable readmissions within 30 days, medical/surgical patients-all Payors, Syracuse hospitals.

	Number of Readmissions				Percent of Total Readmissions			
	Crouse Hospital	St. Joseph's Hospital Health Center	State University of NY Upstate University Hospital	Total	Crouse Hospital	St. Joseph's Hospital Health Center	State University of NY Upstate University Hospital	Total
Readmissions to Same APR DRG								
October-December 2015	29	72	71	172	15.5	18.7	21.6	19.1
January-March 2016	41	104	109	254	21.4	21.5	30.3	24.5
April-June 2016	45	75	103	223	20.5	17.0	27.2	21.5
July-September 2016	41	79	103	223	20.1	20.0	26.2	22.5
Readmissions to Same APR MDC								
October-December 2015	40	95	61	196	21.4	24.6	18.5	21.7
January-March 2016	48	100	65	213	25.0	20.7	18.1	20.6
April-June 2016	48	107	64	219	21.8	24.4	16.9	21.1
July-September 2016	32	86	75	193	15.7	21.8	19.1	19.5
Readmissions to Different APR MDC								
October-December 2015	118	219	197	534	63.1	56.7	59.9	59.2
January-March 2016	103	280	186	569	53.7	57.9	51.7	54.9
April-June 2016	127	257	212	596	57.7	58.5	55.9	57.4
July-September 2016	131	230	215	576	64.2	58.2	54.7	58.1
Total Readmissions								
October-December 2015	187	386	329	902	100.0	100.0	100.0	100.0
January-March 2016	192	484	360	1,036	100.0	100.0	100.0	100.0
April-June 2016	220	439	379	1,038	100.0	100.0	100.0	100.0
July-September 2016	204	395	393	992	100.0	100.0	100.0	100.0

Source: Hospital Executive Council.

The data indicated that a total of 3968 adult medicine and adult surgery readmissions occurred in the Syracuse hospitals between October 2015 and September 2016. These rehospitalizations accounted for 83.2 percent of all inpatient readmissions in the hospitals during this period. The rest were produced by obstetrics, pediatrics, and mental health. Of the total adult medicine and adult surgery readmissions, 75.0 percent involved adult medicine patients.

The analysis was based on the causes of inpatient readmissions defined by the relationship between the principal diagnoses of the initial admissions and the readmissions. Three types of relationships between initial admissions and readmissions were identified.

The proportions of readmissions that occurred in the same Diagnosis Related Group as the initial admission comprised the most direct relationship between these hospitalizations. Most of these readmissions involved exacerbation of principal diagnoses of initial admissions for chronic diseases such as heart failure, chronic obstructive pulmonary disease, and digestive disorders. They accounted for 22.0 percent of the total medical-surgical readmissions for the 12 month period. They ranged from 15.5 to 21.4 percent of the adult medicine and adult surgery total at Crouse Hospital, 17.0 to 21.5 percent at St. Joseph's Hospital Health Center, and 21.6 to 30.3 percent at the State University of New York Upstate University Hospital.

A second group of rehospitalizations included patients who returned for a different principal diagnosis, defined by the Diagnosis Related Group, within the same body system, Major Diagnostic Category. Most of these readmissions occurred in Major Diagnostic Categories that generated large numbers of adult medicine readmissions such as the Respiratory, Circulatory, and Digestive classifications. They accounted for 20.7 percent of medical surgical readmissions for the combined hospitals during the 12 month period. On a quarterly basis, these patients comprised 15.7 to 25.0 percent of the adult medicine and adult surgery total at Crouse Hospital, 20.7 to 24.6 percent at St. Joseph's Hospital Health Center, and 16.9 to 19.1 percent at the State University of New York Upstate University Hospital.

For each hospital, a majority of inpatient adult medicine and adult surgery readmissions occurred in Major Diagnostic Categories different from those of the initial admission. These patients accounted for 57.3 percent of readmissions in the combined hospitals during the 12 month period. They included 53.7 to 64.2 percent of adult medicine and adult surgery total at Crouse Hospital, 56.7 to 58.5 percent of the total at St. Joseph's Hospital Health Center, and 51.7 to 59.9 percent of the total at Upstate University Hospital.

The second component of the study focused on the third category of the initial analysis, those patients in the Syracuse hospitals who returned for a cause of readmission in a Major Diagnostic Category different from that of the initial admission. Relevant data are summarized in **Table 2**.

This information demonstrated that these readmissions occurred in a wide range of Major Diagnostic Categories. In each three month period within the

Table 2. Potentially preventable readmissions within 30 days, readmissions to different APR Major Diagnostic Category medical/surgical patients-all Payors, Syracuse hospitals.

MDC/Description	Number of Readmissions				Percent of Total			
	October-December 2015	January-March 2016	April-June 2016	July-September 2016	October-December 2015	January-March 2016	April-June 2016	July-September 2016
01 Nervous System	19	22	29	23	3.6	3.9	4.9	4.0
03 Ear, Nose, Throat, Mouth & Craniofacial	2	1	1	1	0.4	0.2	0.2	0.2
04 Respiratory System	88	98	94	86	16.5	17.2	15.8	14.9
05 Circulatory System	69	68	79	62	12.9	12.0	13.3	10.8
06 Digestive System	58	67	61	75	10.9	11.8	10.2	13.0
07 Hepatobiliary System & Pancreas	12	8	15	8	2.2	1.4	2.5	1.4
08 Musculoskeletal System & Connective Tissue	10	12	10	8	1.9	2.1	1.7	1.4
09 Skin, Subcutaneous Tissue & Breast	20	17	9	17	3.7	3.0	1.5	3.0
10 Endocrine, Nutritional & Metabolic	34	35	43	48	6.4	6.2	7.2	8.3
11 Kidney & Urinary Tract	47	50	52	53	8.8	8.8	8.7	9.2
16 Blood & Immunology Disorders	10	10	15	13	1.9	1.8	2.5	2.3
18 Infectious & Parasitic Diseases	115	129	126	132	21.5	22.7	21.1	22.9
21 Poison, Toxic Effect & Other Injury	35	35	38	39	6.6	6.2	6.4	6.8
23 Rehabilitation, Aftercare, Other Health Status	15	17	24	11	2.8	3.0	4.0	1.9
Total	534	569	596	576	100.0	100.0	100.0	100.0

Source: Hospital Executive Council.

Syracuse hospitals, a majority of these readmissions involved a combination of infectious diseases and adult medicine conditions such as respiratory, circulatory-

ry, and digestive disorders. During the twelve month period of the study, these four Major Diagnostic Categories were associated with 60.4 to 63.6 percent of readmissions that occurred outside the MDC of the initial admission.

The study data indicated that infectious diseases, MDC 18, were the single largest source of readmissions outside the original Major Diagnostic Category for each hospital and time period. Within this Major Diagnostic Category, sepsis was the major cause of readmissions. The data suggested that these diagnoses were related to readmissions and other utilization issues such as extended stays.

The study data also demonstrated that large numbers of readmissions that occurred outside the Major Diagnostic Category on the initial admission involved anatomical areas such as the respiratory, circulatory, and digestive systems that have been sources of most adult medicine hospital inpatient admissions and readmissions. Most of these conditions were present on the initial admissions as secondary diagnoses.

This portion of the study demonstrated that the largest percentages of medical and surgical readmissions involved more than one body system. The causes of these admissions were identified within the definition of adult medicine.

5. Discussion

The reduction of hospital inpatient readmissions has been a major focus of efforts to improve patient outcomes and reduce health care costs. Significant attention has been applied nationally to the management of chronic conditions such as heart failure, chronic obstructive pulmonary disease, and diabetes in hospitals in efforts to reduce recidivism. The complicated nature of readmissions suggests, however, that efforts to address them need to be accompanied by careful evaluation of a wide range of clinical causes rather than individual diagnoses.

This study focused on evaluation of the clinical causes of hospital readmissions of adult medical-surgical patients within 30 days of the admissions that preceded them. It was based on the principal diagnoses of readmissions. The principal diagnosis is defined as the condition that was responsible for each hospital admission. This is a definition that is used throughout the health care industry in the United States.

The study focused on adult medicine and adult surgery readmissions in the hospitals that comprised the acute care system of a small metropolitan area during a twelve month period. It included almost 4000 individual readmissions, approximately 83 percent of the community total.

The study data demonstrated that, at the aggregate and hospital specific levels, only about 22 percent of inpatient readmissions were for the same diagnosis as the initial admission that preceded them. The quarterly ranges of each of the three hospitals were consistent with this rate. The data suggested that the most direct relationship between initial admissions and readmissions existed for a minority of all adult medicine and adult surgery readmissions in the community.

The study data indicated that another 20 percent of hospital readmissions in the population involved a diagnosis different than that of the initial admission,

but in the same body system. This meant that 40 - 45 percent of readmissions involved the same anatomical area.

Perhaps most importantly, the study demonstrated that a slight but consistent majority of inpatient readmissions were caused by diagnoses in different body systems than the initial admission. This majority of readmissions appeared in the data for all three hospitals.

The Major Diagnostic Categories involved in this category suggested that most of these readmissions involved medical diagnoses of infectious disease, respiratory, circulatory, and digestive conditions. Many of these diagnoses were present on the initial admissions as secondary diagnoses. They involved conditions that are usually classified as internal medicine.

6. Recommendations

The study data suggested that efforts to address the causes of hospital inpatient readmissions should be based on the management of a broad range of adult medicine conditions rather than individual diagnoses. This approach will involve a much larger range of conditions than programs that narrowly address individual diagnosis such as heart failure or COPD.

This approach will take advantage of the clinical experience with connections among these conditions. This means that clinical managers of readmissions will need to be well versed in internal medicine. This background will prepare them for guiding the care of patients with issues in different body systems.

The same suggestion could be made to payers and regulators seeking to improve health care outcomes. Their efforts need to be based on clinical areas such as adult medicine, rather than individual diagnoses. As interest in improving health care outcomes continues to develop, this kind of approach holds promise for both consumers and providers of care.

References

- [1] Dentzler, S. (2011) Urgent Measures for an Old Problem. *Health Affairs*, **30**, 1626. <https://doi.org/10.1377/hlthaff.2011.0961>
- [2] Meyer, H. (2017) President Trump's Healthcare Plate Is Full and It Won't Go Down Easy. *Modern Healthcare*, **47**, 6-7.
- [3] Dickson, V. and Meyer, H. (2017) New HHS Secretary Price Faces a Crushing Inbox. *Modern Healthcare*, **47**, 6-7.
- [4] Rau, J. (2014) Medicare Fines 2610 Hospitals in Third Round of Readmission Penalties. *Kaiser Health News*, 2 October 2014.
- [5] Gorodeski, E.Z., Starling, R.C. and Blackstone, E.H. (2010) Are All Readmissions Bad Readmissions? *The New England Journal of Medicine*, **363**, 297-298. <https://doi.org/10.1056/NEJMc1001882>
- [6] Berensdon, R.A., Paulus, R.A. and Kalman, N.S. (2012) Medicare's Readmission Reduction Program: A Positive Alternative. *The New England Journal of Medicine*, **366**, 1364-1366. <https://doi.org/10.1056/NEJMp1201268>
- [7] Kansagara, D., Englander, H., Salantiro, A., Kagen, D., Theobald, C., Freeman, M. and Kripalani, S. (2011) Risk Prediction Models for Hospital Readmission: A Sys-

- tematic Review. *JAMA*, **306**, 1688-1698. <https://doi.org/10.1001/jama.2011.1515>
- [8] Grunier, A., Dhalla, A., van Walraven, C., Fisher, H.D., Camacho, X., Rochon, P.A. and Anderson, G.M. (2011) Unplanned Readmissions after Discharge among Patients Identified as Being at High Risk of Readmission Using a Validated Predictive Algorithm. *Open Medicine*, **5**, e104-e111.
- [9] Goldfield, N.J., McCullough, E.C., Hughes, J.S., Tang, A.M., Eastman, B., Rawlins, L.K. and Averill, R.F. (2008) Identifying Potentially Preventable Readmissions. *Health Care Financing Review*, **30**, 75-92.
- [10] Lagoe, R., Nanno, D. and Luziani, M. (2013) Clinical Identification of Patients Readmitted to Hospitals: Why Patients Return. *BMC Research Notes*, **6**, 419. <https://doi.org/10.1186/1756-0500-6-419>
- [11] Lagoe, R., Kronenberg, P. and Littau, S. (2016) Readmissions by Hospital Inpatient Service at the Community Level. *Internal Medicine Review*, **2**.



Submit or recommend next manuscript to SCIRP and we will provide best service for you:

Accepting pre-submission inquiries through Email, Facebook, LinkedIn, Twitter, etc.

A wide selection of journals (inclusive of 9 subjects, more than 200 journals)

Providing 24-hour high-quality service

User-friendly online submission system

Fair and swift peer-review system

Efficient typesetting and proofreading procedure

Display of the result of downloads and visits, as well as the number of cited articles

Maximum dissemination of your research work

Submit your manuscript at: <http://papersubmission.scirp.org/>

Or contact ijcm@scirp.org

Comparison of Sensory Processing and Semantic Differentiation in Peoples with Schizophrenia, Multiple Sclerosis and Alzheimer's Disease

Jahan Sadat Asadi Bijaeeyeh^{1*}, Hosein Ghamari Givi², Ali Sheykholeslami³

¹Educated of MA, Rehabilitation Counseling, Faculty of Education and Psychology, University of Mohaghegh Ardabili, Ardabil, Iran

²Professor, Faculty of Education and Psychology, University of Mohaghegh Ardabili, Ardabil, Iran

³Assistant Professor, Faculty of Education and Psychology, University of Mohaghegh Ardabili, Ardabil, Iran

Email: *asadijahan70@gmail.com

How to cite this paper: Bijaeeyeh, J.S.A., Givi, H.G. and Sheykholeslami, A. (2017) Comparison of Sensory Processing and Semantic Differentiation in Peoples with Schizophrenia, Multiple Sclerosis and Alzheimer's Disease. *International Journal of Clinical Medicine*, 8, 257-264.
<https://doi.org/10.4236/ijcm.2017.84025>

Received: January 4, 2017

Accepted: April 27, 2017

Published: April 30, 2017

Copyright © 2017 by authors and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

Aim: The purpose of this study was comparison of sensory processing and semantic differentiation in patients with schizophrenia, multiple sclerosis (MS) and Alzheimer's disease. **Method:** Our research method was causal-comparative. Statistical population were patients with schizophrenia and patients with multiple sclerosis and Alzheimer's disease that are kept by formal caregivers in welfare centers in Gilan or by informal caregivers in families in Rasht city of Gilan province in Iran. 45 persons with MS, Alzheimer's disease and schizophrenia (in each group 15 persons) were randomly selected by accessible sampling method in 2014. Then, subjects were asked to response to sensory profile questionnaires to measure of sensory processing and ozgood semantic differentiation questionnaires to measure of semantic differentiation, then raw data were analyzed by multiple analyses of variance with using of spss₁₆ software. **Results:** P value less than 0.05, namely $p < 0.05$ was considered as significant. The result showed that there were significant differences between sensory processing and semantic differentiation in patients. Sensory processing of Alzheimer (mean = 48.80 cl 95% = 45.10 - 52.49, $p = 0.001 < 0.01$), had the maximum mean in three groups. Semantic differentiation of Alzheimer (mean = 26.26 cl 95% = 23.71 - 28.82, $p = 0.341 > 0.05$), had the maximum mean in three groups. **Discussion and Conclusion:** Because sensory processing and semantic differentiation aren't in a desirable condition in patients with schizophrenia, so it is necessary that the people who are at high risk of developing the disease or the initial stages of the disease, must be acted to improve their sensory processing and semantic differentiation.

Keywords

Schizophrenia, Multiple Sclerosis, Alzheimer, Sensory Processing,

1. Introduction

Criterion B for schizophrenia gets more attention in DSM-5: “Level of functioning... is markedly below the level achieved prior to the onset”. This is *not* a criterion for schizoaffective disorder (This is apparently unchanged from DSM-4).

American Multiple Sclerosis Association [1] [2] see that Multiple sclerosis is an immune mediated process where an abnormal response puts the immune system against the central nervous system including the brain, spinal cord and optic nerves.

Alzheimer’s disease or senile dementia is a progressive and debilitating chronic brain disorder, that is associated with profound effects on memory, intelligence and ability to care for themselves, and a defect in speech, motor activity, recognition of landscapes and familiar peoples or dysfunction in planning, innovation, organizing and abstract reasoning. Diagnosing a person with Alzheimer’s disease or the likelihood of developing Alzheimer’s disease in an elderly person is fearful for her or his relatives and carers [1] [3]. Usually “memory disorder”, is the first symptom that arises.

Memory refers to recollection of something from the past and it is usually done consciously. Perhaps, sensory processing is the most essential component of psychological, that forms the base of how people perceive and react to environmental stimuli. New evidence shows that people process the sensory information in different ways. This means that some people are more sensitive than others to have sensory information [4] [5].

In a study by [6] under the title of “sensory processing in Schizophrenia; missing and avoiding information”, three groups of people, first group people with schizophrenia, second, patients with bipolar disorder, third, normal people as control group, were compared on basis of a four components model of adult sensory profile with sensory sensitivity, sense avoid, low registration and sense searching variables that are described as behavioral responses to sense. In comparison with normal group, all the two groups of patients with schizophrenia and bipolar disorder, had high score in sense avoid. Schizophrenia group had higher score in low registration and lower score in sense searching rather than healthy group. There were not any differences between the two groups of schizophrenia and bipolar disorder. According to the result of this research, patients with schizophrenia have desire to lose of available sensitive stimuli. When stimuli actually appear, they are often avoided.

Initial descriptions of sensory sensitivity, McGhie & Chapman [7] about attention deficit in patients with schizophrenia, including some personal reports, that describe the noises loudness, color brightness, distraction and disorganization in patient. Sensory gate insufficiency, that is measured by pre-trauma and

latent inhibition such as techniques, also denotes the inability to filter out irrelevant information in this disorder. But Brown & *et al.* [8] in their studies didn't find any meaningful differences between patients with schizophrenia, patients with bipolar disorders and normal people, in view point of sensory sensitivity. But the avoidance of feelings in people with schizophrenia and bipolar disorder was higher than normal. The schizophrenic patients frequently fail to response and ascribe meaning to stimuli. Their performance in reaction time tasks is an example of slowed response in schizophrenia. Return responses (the urge to go back to previous responses) can also be another example of low sensory registration in patients with schizophrenia. In connection with sense searching Brown & *et al.* (Ghamari and Bashar poor, 2009), concluded that schizophrenia and bipolar disorder groups were significantly obtained lower scores in sense search. According to the results, since the extreme sensitivity and inhibition to sensory stimuli and also impairment in social skill which is the result of sensory processing disorder, is a very important aspect of schizophrenia and partly to major depressive disorder, therefore, identifying the style of sensory processing in patients with these disorders, can help to precise identify of impairment.

Rotenberg, quoted by [9] in a study on patients with schizophrenia showed that, cognitive impairment and inability to make appropriate use of past information, are connected with perceptual input or information processing and formation of signs that need to the left hemisphere activity.

Mehrinejad *et al.* [10] write that several studies have shown that the style of repressive character, negative emotions, inability to talk about feeling, over assimilation and hysteric characteristics with a weaker immune system and emotions expression and thoughts depended on excitement, are related to immune system performance improvement.

In a study by [11] under the title of "Sensory symptoms of multiple sclerosis: a hidden reservoir of morbidity, the following results reports: Sensory symptoms were more common in MS patients than in controls, and differed in severity and quality. There was however a strong correlation between the total number of sensory symptoms reported and the presence of disability in the MS patients. Conclusions: Sensory symptoms are common in MS patients. Pain syndromes, transient neurologic events, Lhermitte's phenomenon (to feel an electric shock symptom in the arms and legs downward by shaking and moving the neck), fatigue, respiratory symptoms and vertigo were present significantly more frequently in patients with MS than in a control population and contributed to subjective morbidity. Future clinical trials assessing therapy in MS might include sensory symptoms as secondary endpoints to capture this "hidden reservoir" of disease morbidity.

2. Research Hypotheses

Sensory processing in patients with schizophrenia and multiple sclerosis (ms) is different.

Sensory processing in patients with schizophrenia and Alzheimer's is different.

Sensory processing in patients with multiple sclerosis (MS) and Alzheimer's is different. Semantic differentiation in patients with schizophrenia and multiple sclerosis (ms) is different.

Semantic differentiation in patients with schizophrenia and Alzheimer's is different.

Semantic differentiation in patients with multiple sclerosis (MS) and Alzheimer's is different.

3. Methods

Our research method was causal-comparative. Statistical population were patients with schizophrenia in Mirzakochak mental hospital and patients with multiple sclerosis and Alzheimer's disease that are kept by formal caregivers in welfare centers or by informal caregivers in families in Rasht city of Guilan province in Iran. 45 persons with MS, Alzheimer's disease and schizophrenia (in each group 15 persons) were randomly selected by accessible sampling method in 2014. Disease is independent variable and sensory processing and semantic differentiations are dependent variables. Then, subjects were asked to response to sensory profile questionnaires to measure of Sensory processing memory and to ozgood semantic differentiation questionnaire to measure of Semantic differentiating processing. This test is made after extensive research and application of factor analysis by Ozgood. This feature is made of 10 contradictory attributes and the participants will be asked to describe themselves based on 10 attributes. In this method Ozgood measures the emotional sense of the feelings against the words. The subject must score himself (or herself) with these ten characters, for example (Active-passive, quiet-restive) on a 7-points Likertscale [12]. Coefficient of Cronbach's Alpha of this test is 0.85. Coefficient of internal consistency of subscales of sensory processing test were reported between 0.60 to 0.78 and Cronbach's Alpha coefficient of this test for total scale is 0.87 and for subscales of low registration, sense searching, sensory sensitivity and sense avoiding are as 0.72, 0.65, 0.75 and 0.71 [13]. Then raw data were analyzed by multiple analyses of variance (MANOVA) with using of spss₁₆ software.

4. Results

Results of **Table 1**: Given that semantic differentiation mean of schizophrenia is 23.93 and multiple sclerosis is 26.20 and Alzheimer is 26.26 (maximum in three groups).

Results of **Table 2**: Given that total sensory processing mean of schizophrenia patient is 37 and multiple sclerosis is 37.40 and Alzheimer is 48.80 (maximum in three groups).

Results of **Table 3**: shows that for example low registration variable mean of schizophrenia is 9.20 and multiple sclerosis is 8.20 and Alzheimer's disease is

Table 1. Descriptive information about semantic differentiation in the three examined groups.

Variables	Disease groups	Frequency	Mean	Std. Deviation	95% confidence interval	
					Lower bound	Upper bound
Total semantic differentiation	Schizophrenia	15	23/93	1/265	21/38	26/48
	Multiple sclerosis	15	26/20	1/265	23/64	28/75
	Alzheimer	15	26/26	1/265	23/71	28/82

Table 2. Descriptive information about sensory processing in the three examined groups.

Variables	Disease groups	Frequency	Mean	Std. Deviation	95% confidence interval	
					Lower bound	Upper bound
Total sensory processing	Schizophrenia	15	37	1/83	33/30	40/69
	Multiple sclerosis	15	37/40	1/83	33/70	41/09
	Alzheimer	15	48/80	1/83	45/10	52/49

Table 3. Descriptive information about the components of sensory processing in the three examined groups.

variables	Disease groups	Frequency	Mean	Std. Deviation	Std. Error Mean
Low Registration	Schizophrenia	15	9/20	2/93	0/76
	Multiple sclerosis	15	8/20	3/12	0/80
	Alzheimer's disease	15	10/87	2/85	0/73
Sensory sensitivity	Schizophrenia	15	8/40	3/08	0/80
	Multiple sclerosis	15	9/60	3/04	0/78
	Alzheimer's disease	15	10/47	2/95	0/76
Sensory avoidance	Schizophrenia	15	8/47	3/56	0/92
	Multiple sclerosis	15	7	3/12	0/80
	Alzheimer's disease	15	12/93	2/31	0/60
Sense searching	Schizophrenia	15	10/93	2/89	0/75
	Multiple sclerosis	15	12/47	3/46	0/89
	Alzheimer's disease	15	14/40	1/30	0/33

10.87 and so on.

Results of **Table 4**: Given that significance level of $p = 0.47 > 0.05$, variances are equal.

The result of **Table 5**: In firstrow, given that significant level equal to $p = 0.001 < 0.01$, so there is a significant difference between the groups in sensory processing.

Table 4. Levin test for sensory processing.

Dependent Variable	F	Df1	Df2	sig
Sensory processing	3/28	2	42	0/47
Semantic differentiation	0/867	2	42	0/47

Table 5. Results of the multivariate analysis of sensory processing.

Source	Depended variable	Sum of squares	Degrees of freedom (d.f)	Squares mean	F	sig	Partial Eta Squared
Groups	Sensory processing	1346/8	2 and 42	673/4	13/379	0/000	0/389
	Semantic differentiation	52/933	2 and 42	26/467	1/102	0/34	0/05

In second row, given that significant level equal to $p = 0.341 > 0.05$, so there isn't a significant difference between the groups in semantic differentiation.

5. Discussion and Conclusions

Average sensory processing and average semantic differentiation are different in three groups of patients with schizophrenia, multiple sclerosis and patients with Alzheimer. An obvious conclusion is that the sensory processing in patients with multiple sclerosis and Alzheimer's is better than the group with schizophrenia. This issue is consistent with the inhibition reaction by patients with schi-zophrenia that cited by [5] in literature. Totally patients with Alzheimer's disease had significantly better performance in sensory processing. Patients with schizophrenia had lower performance than the other two groups. The semantic differentiation in patients with multiple sclerosis and Alzheimer's is better than the group with schizophrenia. This issue is consistent with the studies of [10] [12] [13] in literature. Totally patients with Alzheimer's disease had better performance in semantic differentiation. Patients with schizophrenia had lower performance than the other two groups.

One of the major limitations in sample size is illiterate or low literacy people which make it difficult to gather information and need to give sufficient information and required training to individuals to fill the questionnaires which are time consuming. In the present study variables such as gender, marital status, education, and the severity and duration of illness are not included.

Given that sensory processing in patients with Alzheimer was better than the other tow groups, therefore, it is better to use of sensory processing and its enhancement to treatment and rehabilitation of these people, it means that must be used of sensory processing to compensate other memories.

Because sensory processing isn't in a desirable condition in patients with schizophrenia and multiple sclerosis (MS), so it is necessary that the people who are at high risk of developing the disease or the initial stages of the disease, must

be acted to improve their sensory processing.

Given that semantic differentiation in patients with Alzheimer was better than the other tow groups, therefore, it is better to use of semantic differentiation and its enhancement to treatment and rehabilitation of these people, it means that must be used of semantic differentiation to compensate other memories.

Because semantic differentiation isn't in a desirable condition in patients with schizophrenia, so it is necessary that the people who are at high risk of developing the disease or the initial stages of the disease, must be acted to improve their semantic differentiation.

References

- [1] Givi, G., Shykhosslami, H., AsadiBijaeyeh, A. and Sadat, J. (2016) Comparison of Sensory Processing and Semantic Differentiation in Peoples with Schizophrenia, Multiple Sclerosis and Alzheimer's Disease. *IJOAB*, **7**, 77-83.
- [2] Yang, M. (2013) dsm-5: Schizophrenia. 28 August. www.mariayang.org
- [3] American National Multiple Sclerosis Society (2014) What Is MS, Share.net, MSA, Improving Lives Today! <http://mymsaa.org/>
- [4] Khatoni, M. and Zahari, S. (2010) Communication Problems in Elderly Patients with Alzheimer's Disease and Primary Caregivers. *Journal of Elderly*, **5**, 36-42.
- [5] Ghamari, H. and Bashar Poor, S. (1388) The Study of Sensory and Semantic Information Processing in Schizophrenia, Major Depressive Disorder and Normal. *Journal of Clinical Psychology*, **2**, 17-25.
- [6] Beatty, W.W., Goodkin, D.E., Monson, N., Beatty, P.A. and Hertsgaard, D. (1988) Anterograde and Retrograde Amnesia in Patients with Chronic Progressive Multiple Sclerosis. *Archives of Neurology*, **45**, 611-619. <https://doi.org/10.1001/archneur.1988.00520300029013>
- [7] Gardner, A.P.W. and Gibson, S.L.M. (1989) Semantic Differential Techniques in the Identification of Individuals Assessment of Health State: A Case Study of a Patient within a Homoeopathic Regime. *Counselling Psychology Quarterly*, **2**, 273-288. <https://doi.org/10.1080/09515078908256683>
- [8] Adams, J., Faux, S.F., Nestor, P.G., Shenton, M., Marcy, B., Smith, S. and McCarley, R.W. (1993) ERP Abnormalities during Semantic Processing in Schizophrenia. *Schizophrenia Research*, **10**, 247-257.
- [9] Pekkaonen, E., Jousmaki, V., Kononen, M., Reinikainen, K. and Partanen, J. (1994) Auditory Sensory Memory Impairment in Alzheimer's Disease: An Event-Related Potential Study. *Neuroreport*, **5**, 2537-2540.
- [10] Gourovitch, M.L., Goldberg, T.E. and Weinberger, D.R. (1996) Verbal Fluency Deficits in Patients with Schizophrenia: Semantic Fluency Is Differentially Impaired as Compared with Phonologic Fluency. *Neuropsychology*, **10**, 573-577. <https://doi.org/10.1037/0894-4105.10.4.573>
- [11] Graham, K., Hodges, S. and John, R. (1997) Differentiating the Roles of the Hippocampus Complex and the Neocortex in Long-Term Memory Storage: Evidence from the Study of Semantic Dementia and Alzheimer's Disease. *Neuropsychology*, **11**, 77-89. <https://doi.org/10.1037/0894-4105.11.1.77>
- [12] Hodges, J.R., Patterson, K., Ward, R., Garrard, P., Bak, T., Perry, R. and Gregory, C. (1999) The Differentiation of Semantic Dementia and Frontal Lobe Dementia (Temporal and Frontal Variants of Front Temporal Dementia) from Early Alzheimer's Disease: A Comparative Neuropsychological Study. *Neuropsychology*, **13**,

31-40. <https://doi.org/10.1037/0894-4105.13.1.31>

- [13] Jessen, F., Kucharski, C., Fries, T., Papassotiropoulos, A., Hoenig, K., Maier, W. and Heun, R. (2001) Sensory Gating Deficit Expressed by a Disturbed Suppression of the P50 Event-Related Potential in Patients with Alzheimer's Disease. *The American Journal of Psychiatry*, **158**, 1319-1321.
<https://doi.org/10.1176/appi.ajp.158.8.1319>



Scientific Research Publishing

Submit or recommend next manuscript to SCIRP and we will provide best service for you:

Accepting pre-submission inquiries through Email, Facebook, LinkedIn, Twitter, etc.

A wide selection of journals (inclusive of 9 subjects, more than 200 journals)

Providing 24-hour high-quality service

User-friendly online submission system

Fair and swift peer-review system

Efficient typesetting and proofreading procedure

Display of the result of downloads and visits, as well as the number of cited articles

Maximum dissemination of your research work

Submit your manuscript at: <http://papersubmission.scirp.org/>

Or contact ijcm@scirp.org



Determining the Effectiveness of Cognitive Therapy on Mindfulness-Based in Marital Fatigue and Women Intimacy

Maryam Mosalla¹, Seyed Ali Aleyasin^{2*}

¹MA, Department of Counseling, Faculty of Humanities, Khomein Branch, Islamic Azad University, Khomein, Iran

²PhD, Department of Clinical Psychology, Faculty of Humanities, Khomein Branch, Islamic Azad University, Khomein, Iran

Email: *Aleyasin_psychology@yahoo.com

How to cite this paper: Mosalla, M. and Aleyasin, S.A. (2017) Determining the Effectiveness of Cognitive Therapy on Mindfulness-Based in Marital Fatigue and Women Intimacy. *International Journal of Clinical Medicine*, 8, 265-276.

<https://doi.org/10.4236/ijcm.2017.84026>

Received: March 16, 2017

Accepted: April 27, 2017

Published: April 30, 2017

Copyright © 2017 by authors and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

This research aimed at determining the effectiveness of cognitive therapy based on mindfulness in marital fatigue and married women intimacy. The semi-experimental research design with witness group and evaluation for pretest-posttest was used. The study population consisted of married women, referred to health counseling center in the 1st district of Tehran during 2016 and lasted about 1 year. Using random sampling method, were selected 30 married women referred to health counseling center in the 1st district of Tehran, whom the main reason for their visit was declared incompatibility and marital conflict. And 15 of those who would like to participate in training mindfulness-based cognitive therapy, were in the experimental group and 15 others were in the witness group. For experimental group, were presented mindfulness-based interventions in 8 sessions every session in one and a half hours. In this study, to collect data was to use two questionnaires: measure marital intimacy and marital fatigue. After collecting the results, data were entered into the software Spss and assumptions were evaluated using analysis of covariance. The results showed that the average of experimental group compared with the control group after the intervention health was significantly different in variables like: physical fatigue, mental disability, emotional banality, and intimacy ($p = 0.001$). According to the findings above, it can be concluded that a mindfulness-based cognitive therapy training can reduce marital fatigue and as well as significantly effective in intimacy.

Keywords

Mindfulness, Marital Fatigue, Women Intimacy, Married Women

1. Introduction

The family is the smallest social institutions and its health and social stability,

can have an effective role capability and stability of other institutions. In fact, the family, in the building creatures is ruling body cells and focus on maintaining family traditions and community. A family brings peace and harmony to society and if couples feel living together are favorable they will enjoy from the comfort and security and health. In the meantime, marital relationship has always been regarded as the longest and deepest relationship kind, because satisfactory marriage is beneficial for physical and mental health of couples [1]. Establishing and maintaining intimate relationships and satisfaction of emotional and psychological needs during the marriage, is an art and a skill that in addition to mental health and primary health experiences, requires gain logical insight, communication skills, life skills and perform his duties [2]. One of the variables examined in this study is marital fatigue or exhaustion. Marital fatigue or exhaustion is painfully physical, emotional and psychological condition that affects those who expect dramatic love gives meaning to their lives. This occurs when they realize their relationship, despite their efforts, did not give meaning to life. Pointlessness occurs because of the failures in love and it is the answers to the existing problems. Accumulation of psychological pressure attenuator love, a gradual increase in the incidence of boredom and monotony and gathering small annoyances help appearing pointlessness. [3] [4]. Emotional exhaustion occurs like: feeling depleted, being under pressure, discomfort, malaise and low mood [5] [6]. Mental fatigue is characterized as a decrease in self-esteem, feelings of despair and frustration toward his spouse, frustration and self-dislike [7] [8].

The aim of the current study is to determine the effectiveness of cognitive therapy on Mindfulness-based in marital fatigue and women intimacy in Iran.

Literature Review

Physical, emotional and psychological fatigue components can be equivalent with disillusionment. In other words, disillusionment is the first stage of marital. Disillusionment begins with feelings of anger and despair of the situation and gradually leads us into dissatisfaction. The continuation of this frustration, eventually brings the person in the second phase of depersonalization. Depersonalization also leads to give up and helplessness, *i.e.*, marital burnout [9]. At first, the reaction to burnout may be that couples will try to regain the passion early in life. If these efforts fail, they will question their choice, and focus on the weaknesses and imperfections of each other and it'll be resulted in the intensification of frustration and anger. Some couples despite the lack of vitality still continue their marriage and another set, just be calm, when end their relationship [10]. Another variable examined in this study is intimacy. Psychologists define intimacy ability to communicate (unchecked), and express emotions (no inhibition) and it is mankind's natural condition [11] [12]. Intimacy-process in which the people are trying to approach each other and discover similarities and differences in their feelings and thoughts [13]. Knows the intimacy basic requirements, and defines it: being familiar, parallels and personal relationships mostly emotional love with someone else, which requires knowledge and deep under-

standing of the other person, accept and express thoughts and feelings. And knows it a sign of love threshold. So intimate, interactive process, which is grounded by knowing, understanding, acceptance, rejection, empathy with the feelings of others and appreciate his/her unique view of the world [14].

According to these definitions of intimacy, we can know the agreements in couples, the true love and affection to each other and the obligations of the dimensions, aspects of the intimacy [15] [16] [17]. [18] describes intimacy in its numerous forms but all of them know intimacy a feeling of disclosure, near and partake in someone else's private world [19]. This feature refers to the interaction between spouses and its lack or absence is an indicator of disturbance in the marital relationship [20]. Based on [21], when intimacy becomes clear that the marriage function is well and a lack of intimacy shows that the marital relationship is weak. Enjoy the intimacy between married couples, is an important factor in the creation of stable marriages. [22] stated that avoid intimate relationships, is the factors that caused the failure in family life [23]. Studies and clinical experience show that in modern society, couples experience severe and pervasive problems when establishing and maintaining intimate relationships and compatible with each other [24].

In recent years, the role of cognitive factors in understanding the dynamics of interactions and relationships further considered, which may be cited such structural approaches, mental dynamics, communication, behavior, social learning. Affected the above approaches, prevention patterns and variety educational programs was also proposed. While these patterns have differences in theory, objectives, processes and intervention pattern, but also have common aspects together. Some of these programs include marriage enrichment program, strengthen relationships, couples communication, prevention programs and strengthen the relationship and so on. In these programs underlined on topics such as communication, negotiation, conflict resolution, self-awareness, commitment and responsibility, expectations, strengthen intimacy and sexuality, cognitive restructuring, etc.

One of the new methods that can be a useful in this field is: mindfulness-based interventions that can be considered as a cognitive and behavioral approach practices. Mindfulness-based interventions are considered as a treatment for cognitive-behavioral therapy is the third-generation or third wave. Mindfulness means paying attention in a particular way, focused on objective and the present moment without judgment. Also included keeping alive the consciousness of the present reality [25]. Since marital burnout accompanied with a sense of alienation, apathy and indifference between couples and replace negative emotions than positive emotions, creates a lot of dysfunctional thoughts in people, which determine and control the dysfunctional thoughts and negative emotions (such as depression, anxiety, etc.), cognitive therapy can have favorable results. Research results show that mindfulness-based cognitive therapy in the treatment of symptoms of depression, anxiety and decrease negative thoughts was more effective than cognitive therapy [26]. On the other hand, some studies have shown

that happy couples conceptual harmony (intimacy) than unhappy couples have shown [27]. Conceptual harmony is a sign of mindfulness in the sense that the degree of enthusiasm husband or wife, to reappraisal thoughts about the spouse can assess the degree of resilience and flexibility they have in different situations.

Considering that the marital intimacy can transform the family's base to the strongest growth and human development in a society, and marital burnout can lead to marital dissatisfaction and to undermine foundation of the family, the aim of this study was to determine the effectiveness of mindfulness-based cognitive therapy on marital burnout and Intimacy of married women. And plans to pay it whether mindfulness-based cognitive therapy is effective on burnout and marital intimacy? Current study puts his work to answering a question of two hypotheses that include: 1) Mindfulness-based cognitive intervention is effective in reducing burnout marital married women. 2) Mindfulness-based cognitive interventions are effective in encouraging intimacy of married women.

2. Materials and Methods

2.1. Research Method, Society and Samples

The study used a quasi-experimental study with witness group as pretest-posttest for the evaluation. The study population consisted of married women, referred to health counseling center in the 1st district of Tehran. Using random sampling method, were selected 30 married women Randomly referred to health counseling center in the 1st district of Tehran, whom main reason for their visit were declared incompatibility and marital conflict (Lack of agreement and disagreement between the two couples, inconsistency in opinions, goals and behavior, which are taken in opposition to the another, and conflicts between people because of antithetic interests and different objectives and different perceptions). And 15 of those who would like to participate in training mindfulness-based cognitive therapy, were in the experimental group and 15 others were in the witness group. For this experimental study, after obtaining the necessary permits for the sampling and coordination for classes at health counseling center in the 1st district of Tehran, at the beginning, pre-test was performed on all participants. In the next step, mindfulness-based cognitive therapy sessions were presented treatment for the experimental group in eight sessions of 1, 5 hours based on a plan that has been developed by Segal, Teazdel and Williams. In each session, after reviewing homework and provide a brief explanation about the previous meeting and explanations about the subject of the present session, exercises were performed. At the end of all educational sessions, feedback was obtained from the participants. In addition, an audio copy of mindfulness training and a summary of each session, were given to the participants to do practices at home between training sessions. One week after the last session of mindfulness training on the experimental group, post-test was performed for both groups. After the intervention, on the experimental group to determine the effect of this treatment in the longest follow-up time for 2 months was performed. **Table 1** is a summary of the activities of treatment in each of the eight sessions.

Table 1. Mindfulness-based cognitive therapy meetings general schema.

First session: Autopilot	Member acquaintance-the creating of the therapeutic relationship-process of holding sessions-practice eating raisins-body checking practice
Session II: Challenges with obstacles	body checking practice-ten minutes conscious breathing exercises-thoughts and feelings practice
Session III: Mindfulness of Breathing	Sitting meditation focusing on awareness of breathing and body-breathing space for three minutes-review pleasant week interactive experiences and physical sensations, thoughts, feelings and related mood experiences
Session IV: Stay in the present	Five minutes a conscious vision or hearing-sitting meditation with awareness of breathing, body sounds and thoughts-walk consciously-a breathing space for three minutes-review interactive unpleasant physical sensations, thoughts, feelings and related mood experiences
Session V: Acceptance and permission/license being present	Sitting meditation, with awareness breathing and body-practice letting to emotional experiences of "being" without judging or trying to change them-experience educational avoid using metaphors
Session VI: Thoughts are not facts	Sitting meditation, with awareness of breathing and body-a breathing space for three minutes-exercise, think and alternative views, emphasizing the fact that thoughts are not facts-preparing for the end sessions
Session VII: How can I take care of myself in the best way?	Sitting meditation, with awareness of breathing and body, sounds, thoughts and emotions-a breathing space for three minutes-review the relationship between activity and mood
Session VIII: Use what you have learned to cope with next mood states	Body checking exercise-discussion about the use of mindfulness training in daily routine and problems that hinder doing homework

2.2. Research Tools

2.2.1. Couple Burnout Measurement (CBM)

Scale of marital boredom is a self-assessment tool to measure the degree of marital boredom of couples. This scale of self-assessment tool borrowed from another self-assessment tool to measure boredom. This scale was invented by Pines. Couple Burnout Measurement has 21 articles that include three main components of physical fatigue (e.g. tiredness, lethargy and having sleep disturbance) emotional breakdown (feelings of depression, hopelessness, in entrapment) and mental breakdown (such as feelings of worthlessness, frustration and anger spouse). All of these items are answered on a seven-point scale [27] [28] [29]. Validity coefficient assessment of marital boredom scale showed that it has an internal consistency between variable in range of 0.84 and 0.90. The validity is approved by negative correlation with positive communication features. Test-retest reliability for a one month was 0.89, 0.76 for a period of two months, and 0.66 for the four-month period. Internal continuity for most of the subjects was measured by constant coefficient Alpha, which is between 0.91 and 0.93 [30] [31].

2.2.2. Inventory of Marital Intimacy

This scale has been prepared by Walker and Thompson. This is a 17-item tool used to test love and intimacy. Scores range from 1 (never) to 7 (always), that the higher score is a sign of intimacy. This scale with Alpha 0.91 to 0.97 contains good consistency [32] [33]. Total score of test can be achieved through total scores of questions and dividing it by the number 17. This measure is part of a larger tool that encompasses several dimensions of intimacy but has been reported by providers like independent measurements. The validity of the method and content validity was examined. So that many of these masters field of counseling and psychology check questionnaire, and stated that tool measures marital intimacy [34].

2.3. Analyze Data

In this study, 23 SPSS software was used for statistical analysis. Describing the data, was used descriptive statistics indexes such as mean and standard deviation (in the pre-test and post-test and follow-up) and used in the inferential analysis of covariance.

3. Results

In findings part, first of all were studied the mean and standard deviation of the research variables in experimental and control groups and the two pre-test and post-test course are on the **Table 2**.

As shown in **Table 2**, the average post-test of witness group on variables of physical fatigue, mental and emotional burnout and marital burnout and intimacy has been reduced compared with the control group and the experimental group's average increase more in intimacy compared with the control group. To check the significant difference in the average obtained in **Table 2**, the analysis

Table 2. Comparing the mean and standard deviation of the pre-test and post-test physical fatigue, emotional and mental disability in two groups.

Variable	Group	Pre-test		Post-test	
		Mean	Standard deviation	Mean	Standard deviation
Physical fatigue	witness	16.40	1.72	16.26	1.57
	experiment	19.20	1.85	15.33	0.975
Mental disability	witness	25.00	2.85	24.06	2.63
	experiment	26.20	2.17	22.60	2.41
Emotional disability	witness	46.60	2.79	45.66	2/66
	experiment	49.26	3.45	43.00	2.47
Marital burnout	witness	88.00	3.16	86.00	3.96
	experiment	94.66	3.35	80.93	5.27
Intimacy experiment	witness	69.33	5.48	67.60	5.47
	experiment	75.46	5.42	80.20	2.48

of covariance was used. Before performing the analysis of covariance, the pre-suppositions of the test was discussed. To study the normal distribution of traits in groups was used test of Wilkes-Shapiro, which results in physical fatigue, the emotional and psychological burnout and marital burnout and intimacy variables was not significant statistically that represents a normal distribution trait in both study groups. The Levene test to check the homogeneity of variances for the above variables was not statistically significant, and the result suggests of the consistency of the variance of the studied variables. After checking the pre-suppositions of analysis of covariance, in **Table 3**, the results of covariance analysis are expressed for comparing two experimental and control groups in physical fatigue, emotional and mental burnout variable.

As is shown in **Table 3** by controlling the pre-test between the experimental and witness groups, subjects in terms of the physical fatigue, mental breakdown and emotional disability there is a significant difference ($P = 0.001$). So that the Amount of effect or difference in physical fatigue variable equals 0.41, means 42 percent of the individual differences, mental disability variable 0.70 means 70 percent of individual differences, and emotional disability variable 0.28 means 25% of individual differences, are recorded scores on Cognitive Intervention Effects on Mindfulness. So the hypothesis is confirmed about the effectiveness of mindfulness-based cognitive interventions to reduce marital burnout in married women. The **Table 4** has been investigated to determine the effects of mindfulness-based therapy in the intimacy of married women.

As is shown in **Table 4** by controlling the pre-test, between the experimental and witness groups of subjects there is a significant difference in terms of intimacy score ($p = /001$ and $F = 55/87$). The effect or difference equal to $/674$, about 67 percent of individual differences in intimacy scores of the effects of mindfulness-based cognitive intervention. Thus, this hypothesis is accepted.

Table 3. Results of covariance analysis on the post-test average scores of physical fatigue, mental and emotional burnout of the two groups with pre-test control.

Variables	Changes source	Sum of squares	Degrees of freedom	F	The significance level P	Square of Eta	Statistical power
Physical fatigue	Pre-test	18.135	1	16.250	0.001	0.376	0.973
	Training effect	21.761	1	19.49	0.001	0.419	0.989
Mental disability	Pre-test	158.695	1	215.98	0.001	0.889	1.00
	Training effect	47.548	1	64.714	0.001	0.706	1.00
Emotional disability	Pre-test	14.353	1	2/26	0.144	0.077	0.306
	Training effect	67.403	1	10.64	0.003	0.283	0.882

Table 4. Analysis of covariance one-way on average scores of post-test intimacy of women in the two groups with pre-test control.

Changes source	Sum of squares	Degrees of freedom	F	The significance level P	Square of Eta	Statistical power
pre-test	286/568	1	35/26	/001	/566	1/00
Training effect	454/087	1	55/87	/001	/674	1/00

4. Discussion

This study aimed to determine the effectiveness of mindfulness-based cognitive therapy on marital burnout and intimacy of married women in Khomeini Shahr. For this purpose, a sample of 30 married women were selected and after accomplishing the intended test and therapeutic intervention, the results obtained and the findings were discussed. The first finding of this research was that mindfulness-based cognitive therapy on physical fatigue, emotional and psychological disability of married women is effective. This finding is consistent with results of [35] [36] [37]. To explain these findings, it can be suggested that mindfulness-based interventions associated with a set of formal meditation exercises, where participants are directing their attention in a particular way. This series of meditation exercises can be reduced and destroyed because of physical fatigue. Other methods are shorter or informal and insist on mindfulness in daily life [38]. These interventions include focused attention training where person focused his attention on a specific stimulus such as breathing, body sensations and so on, during a specific time period. To do this, are used mental and physical relaxation techniques and cognitive techniques also participants learned in exercises such as body checks and the three-minute breathing space focused their attention on the body or breathe and be relieved from the preoccupation with negative thoughts and minds to come out of auto mode and thereby reduced their physical fatigue. Also, after the emotional disability, marital burnout includes lack of passion, lack of satisfaction, emotional erosion and loss of motivation. People who are suffering from emotional disability feel that despite numerous attempts they do not reach the desired result. They may get angry in normal mode and feel that they have lost fun and vivacity sense [39] [40]. Emotional fatigue can make the person feel depleted, under pressure, discomfort, illness and inability [10]-[16]. Emotional disability includes feeling helplessness, hopelessness and gets tricked [18]-[33]. Marital burnout sufferers feel after the emotional disability, that there is no hope for them and their relationship point. So, every day they are sad and sadder. According to them, every day is worse than the day before. A mixture of physical and emotional symptoms of burnout in the mental disability caused changes in values, attitudes and beliefs of a person which gets nothing but more suffering and escapism [14] [15]. Mental disability or mental fatigue returns to grow their negative attitude towards work and life. These symptoms are normally seen in normal individuals [7] [8]. [9] believes that the person, who

experiencing burnout shows symptoms of depression, irritability, hopelessness and low self-esteem and increase anxiety [20] [21] [22]. Mental disability or mental fatigue caused by burnout as a decrease in self-esteem and a negative opinion occur towards personal relationships and especially the relationship with the spouse. When a couple love each other, not only to themselves but to all aspects of life feel comfortable, but everything is done with the onset of fatigue. Couples strangely notice the smallest and most banal mistakes in the other party and quickly lose their patience and tolerance, and make life unbearable [11] [12].

The second study results show that mindfulness-based cognitive therapy is effective in intimacy of married women. The results are consistent with the results of research [25] [26] [27] [28]. This approach teaches people to be relieved of habitual thoughts rather than get involved with them and let the thoughts and feelings come and go, without having to be involved with them and try to take them away. In this treatment, people learn to stay in the present moment without having to worry about the future or the repeating past [39] and pay their attention to inner experiences at every moment like sensations, thoughts and feelings [37]. Person with the higher functions of the mind, including mindfulness, compassionate attitude and curiosity of mindfulness can effectively exert control emotional responses through inhibition of cortical limbic system [16]. So people who show higher levels of mindfulness, show less negative automatic thoughts and are able to leave their thinking [5]. On the other hand, since the happy couple and close have shown more Conceptual harmony (intimacy) than unhappy couples [2], mindfulness-based cognitive therapy can increase the resilience and flexibility in different positions by increasing person's desire to Reappraisal of thinking about the spouse.

5. Conclusions

In general, as is showed by the results presented in this study, it can be concluded that a mindfulness-based cognitive therapy can reduce marital burnout as well as significantly effective in intimacy. In total, according to data obtained in this study, efficiency and effectiveness of mindfulness-based cognitive therapy was confirmed on studied variables and it seems necessary to therapists and mental health experts for working with its clients, not to be satisfied to use only traditional treatments and do not negligence the use of new treatments like MBCT, which its effectiveness has been proven in various studies.

The study also included that restrictions, some of them may be noted: allocating results to women that prevent it from extending to the men community, interference factors such as socio-economic class subjects in research and having only one control group prevents the comparison of the effectiveness of mindfulness-based therapy with other treatments. Therefore, it is suggested by choosing other treatment option besides this treatment and using men resolve limitations of this study in future research. Also it is suggested that in order to improve their marital burnout we use the results of this study. Counseling centers and social welfare agencies can also hold regular workshops and courses with a focus on

mindfulness-based cognitive therapy by taking a big step forward on improving relations between spouses.

References

- [1] Adams, B. (2009) Athletic Training Education Program Director Burnout: Contributing Factors. PHD Dissertation, University of Dayton, Dayton.
- [2] Chanofsky, S. (2009) Burnout throughout the Lifespan. PHD Dissertation, Widener University, Chester.
- [3] Crawford, M. and Unger, R. (2004) Women and Gender: A Feminist Psychology. 4th Edition, McGraw-Hill, New York.
- [4] Daghagheleh, F., Asgari, P. and Haider, A. (2012) Relation of Forgiveness, Love and Intimacy with Marital Satisfaction. *Social Psychology (New Findings in Psychology)*, **7**, 69-57.
- [5] Dunham, S.M. (2008) Emotional Skillfulness in African American Marriage: Intimate Safety as a Mediator of the Relationship between Emotional Skillfulness and Marital Satisfaction. Doctoral Dissertation, University of Akron, Akron.
- [6] Etemadi, A., et al. (2006) The Study Effect of Couples Therapy on Increasing Couples Intimacy in a Maggot Therapy Way, for Whom Referred to Counseling Centers in Isfahan. *New Findings and Consulting Research*, **5**, 9-22.
- [7] Hatfield, E. (1988) Passionate and Companionate Love in the Psychology of Love. Yale University Press, New Haven.
- [8] Howell, A.J., Digdon, N.L. and Buro, K. (2010) Mindfulness Predicts Sleep-Related Self-Regulation and Well-Being. *Personality and Individual Differences*, **48**, 419-424.
- [9] Huston, T.L. (2009) What's Love Got to Do with It? Why Some Marriages Succeed and Others Fail. *Personal Relationship*, **16**, 301-327.
<https://doi.org/10.1111/j.1475-6811.2009.01225.x>
- [10] Babapour, et al. (2012) The Relationship of Meta-Cognition and Mindfulness Components with Obsessive Beliefs of Students. *Journal of developmental psychology*, **1**, 23-38.
- [11] Baer, R.A. and Krietmeyer, J. (2006) Overview of Mindfulness and Acceptance-Based Treatment Approaches. In: Baer, R.A., Ed., *Mindfulness-Based Treatment Approaches*, Academic Press, Burlington, 3-27.
- [12] Bagarozzi, D. (2001) Enhancing Intimacy Marriage. Brunner/Routledge, Philadelphia.
- [13] Wand, T. (2010) Mental Health Nursing from a Solution Focused Perspective. *International Journal of Mental Health Nursing*, **19**, 210-219.
<https://doi.org/10.1111/j.1447-0349.2009.00659.x>
- [14] Blum, T.W. (2006) Becoming a Family Counselor: A Bridge to Family Therapy Theory and Practice. Wiley, Hoboken.
- [15] Buunk, B.P. and Mutsaers, W. (1999) Equity Perceptions and Marital Satisfaction in Former and Current Marriage: A Study among the Remarried. *Journal of Social and Personal Relationships*, **16**, 123-132. <https://doi.org/10.1177/0265407599161007>
- [16] Jawaheri, H., Kaviani, F. and Bahiraii, H. (2008) The Effect of Mindfulness-Based Cognitive Therapy on Life Quality of Depressed People. *Cognitive Science New Findings Year*, **10**, 39-48.
- [17] Kabat Zinn, J. (2003) Mindfulness-Based Intervention in Context: Past, Present, and Future. *Clinical Psychology: Science and Practice*, **10**, 144-156.

<https://doi.org/10.1093/clipsy.bpg016>

- [18] Kaya, O. (2010) Inclusion and Burnout: Examining General Education Teacher's Experiences in Turkey. PHD Dissertation, Indiana University, Bloomington.
- [19] Kirby, J.S. (2005) The Interpersonal Process Model of Intimacy in Marriage: A Daily-Diary and Multilevel Modeling Approach. *Journal of Family Psychology*, **19**, 314-325. <https://doi.org/10.1037/0893-3200.19.2.314>
- [20] Kouhi, S. (2009) Predictors of Marital Frustration in Isfahan Couples. Family Counseling Master's Thesis, Faculty of Education and Psychology, University of Isfahan, Isfahan.
- [21] Patrick, S., *et al.* (2007) Intimacy, Differentiation, and Personality Variables as Predictors of Marital Satisfaction. *The Family Journal*, **15**, 359-367. <https://doi.org/10.1177/1066480707303754>
- [22] Pines, A. (1996) What Make to Love Dream Not Lead to Disenchantment. Translation Fatemeh Shadab, F., 2002, Phoenix Publishing, Tehran.
- [23] Rajabi, G., *et al.* (2014) Performance Studies Based on Acceptance and Adapted Commitment Couple, Integrated Behavioral Couples Therapy Based on Reducing Symptoms of Anxiety and Marital Conflict, Women, Who Have Marital Distress and Generalized Anxiety Disorder. *Journal of Family Counseling and Psychotherapy*, No. 1, 56-89.
- [24] Rovine, M.J., Laurenceau, J.P. and Barrett, L.F. (2005) The Interpersonal Process Model of Intimacy in Marriage: A Daily-Diary and Multilevel Modeling Approach. *Journal of Family Psychology*, **19**, 314-323. <https://doi.org/10.1037/0893-3200.19.2.314>
- [25] Gong, M. (2007) Does Status in Consistency Matter for Marital Quality? *Journal of Family Issues*, **28**, 152-161.
- [26] Sanaei, B. (2000) Scale of Marriage and Family. Beast, Tehran.
- [27] Segal, Z.V., Bieling, P., Young, T., Macqueen, G., Cooke, R. and Martin, L. (2002) Antidepressant Monotherapy vs. Sequential Pharmacotherapy and Mindfulness-Based Cognitive Therapy, or Placebo, for Relapse Prophylaxis in Recurrent Depression. *Genetic Psychiatry*, **67**, 1256-1264. <https://doi.org/10.1001/archgenpsychiatry.2010.168>
- [28] Sharma, M.P., Mao, A. and Sudhir, P.M. (2012) Mindfulness-Based Cognitive Behavior Therapy in Patients with Anxiety Disorders: A Case Series. *Indian Journal of Psychological Medicine*, **34**, 263-269. <https://doi.org/10.4103/0253-7176.106026>
- [29] Siavashi, H. and Navabinejad, S. (2005) The Relationship between Marital and Irrational Beliefs Patterns of Teachers and Schools of Malayer. *Journal New Findings and Research Consulting*, **4**, 9-34.
- [30] Soltanizadeh, M. (2012) A Comparison of Cognitive-Behavioral Therapy, Metacognitive-Behavioral Therapy and Mindfulness-Based Cognitive Therapy on Marital Satisfaction, Anxiety and Depression in Men. PhD Thesis, Faculty of Education and Psychology, University of Isfahan, Isfahan.
- [31] Teasdale, J.D., Segal, Z., Williams, J.M.G., Ridgeway, V.A., Soulsby, J.M. and Lau, M.A. (2000) Prevention of Relapse/Recurrence in Major Depression by Mindfulness Based Cognitive Therapy. *Journal of Consulting and Clinical Psychology*, **68**, 615-623. <https://doi.org/10.1037/0022-006X.68.4.615>
- [32] Walker, A.B. and Thompson, L. (1983) Intimacy and Intergenerational Aid and Contact among Mothers and Daughters. *Journal of Marriage and the Family*, **45**, 841-849. <https://doi.org/10.2307/351796>
- [33] Wells, A. (2011) Meta-Cognitive Therapy for Anxiety and Depression. The Guilford

Press, New York.

- [34] Kuyken, W., Crane, R. and Williams, M. (2012) Mindfulness-Based Cognitive Therapy (MBCT) Implementation Resources. Mindfulness Centres at Exeter, Bangor and Oxford Universities, Oxford.
- [35] Madani, Y. and Hojjati, S. (2015) The Effect of Mindfulness-Based Cognitive Therapy on Marital Adjustment and Quality of Life in Couples. *Journal of Applied Psychological Research*, **6**, 60-39.
- [36] Mazloumi, S. (2007) The Impact of Marriage Enrichment Program on Increasing Intimacy Couples without Problem. Family Counseling Master's Thesis, University of Welfare and Rehabilitation Sciences, Tehran University, Tehran.
- [37] Navidi, F. (2005) Comparative Investigation of the Relationship between Marital Boredom with Organizational Factor in the Personnel Departments of Education and Hospital Nurse in Tehran. Senior Thesis in the Field of Counseling and Family Tendency, Shahid Beheshti University, Tehran.
- [38] Oladi, Z. (2011) The Effectiveness of Group Therapy Based Reality Therapy to Reduce Boredom and Increase Marital Satisfaction of Married Women. Master's Thesis, Ferdowsi University of Mashhad, Mashhad.
- [39] Omid, A., *et al.* (2013) The Effectiveness of Combined Mindfulness-Based Cognitive Therapy with Cognitive Therapy and Classical Cognitive-Behavioral Therapy in Reducing Dysfunctional Attitudes of Patients with Depressive Disorders. *Scientific Journal of Birjand University of Medical Sciences*, **20**, 383-392.
- [40] Yousefi, N. and Sohrab, A. (2011) By Comparing the Effectiveness of Mindfulness-Based Approaches to Family Therapy and Meta-Cognitive Effects of Mindfulness-Based Cognitive Therapy in Marital Satisfaction and Marital Quality of Clients on the Verge of Divorcing. *Journal of Counseling and Psychotherapy Family*, No. 2, 192-211.



Submit or recommend next manuscript to SCIRP and we will provide best service for you:

Accepting pre-submission inquiries through Email, Facebook, LinkedIn, Twitter, etc.

A wide selection of journals (inclusive of 9 subjects, more than 200 journals)

Providing 24-hour high-quality service

User-friendly online submission system

Fair and swift peer-review system

Efficient typesetting and proofreading procedure

Display of the result of downloads and visits, as well as the number of cited articles

Maximum dissemination of your research work

Submit your manuscript at: <http://papersubmission.scirp.org/>

Or contact ijcm@scirp.org

Investigating the Effectiveness of Dialectical Behavior Therapy in Clinical Symptoms, Anger Control and Emotional Regulation of Bully Children

Fereshteh Partoiy Ziraki¹, Toozandehjani Hassan^{2*}

¹MA in Counseling, Department of Psychology, Faculty of Humanities, Neyshabur Branch, Islamic Azad University, Neyshabur, Iran

²Assistant Professor of Psychology, Department of Psychological Sciences, Faculty of Humanities, Neyshabur Branch, Islamic Azad University, Neyshabur, Iran

Email: *H.Toozandehjani@ymail.com

How to cite this paper: Ziraki, F.P. and Hassan, T. (2017) Investigating the Effectiveness of Dialectical Behavior Therapy in Clinical Symptoms, Anger Control and Emotional Regulation of Bully Children. *International Journal of Clinical Medicine*, 8, 277-292.

<https://doi.org/10.4236/ijcm.2017.84027>

Received: February 24, 2017

Accepted: April 27, 2017

Published: April 30, 2017

Copyright © 2017 by authors and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

The present study aims to investigate the effectiveness of dialectical behavior therapy in clinical symptoms, anger control and emotional regulation of bully children. This research is a pretest-posttest quasi-experimental study design with a nonequivalent control group. The research sample comprises 24 bully children who were purposefully selected from among the students who had responded positively to the researcher's call. The participants were randomly assigned into two experimental and control groups. Group therapy intervention was conducted on the experimental group during ten sessions. The tools applied in this study consisted of Cognitive Emotion Regulation Questionnaire by Garnefski *et al.*, State-Trait Anger Expression Inventory by Spielberger and Bullying Scale by Illinois, Espelage and Holt and the subjects answered to their questions in the stage of pretest and posttest. In this research, the data was analyzed based on the analysis of covariance test and with the aid of SPSS software. The findings demonstrated that dialectical behavior therapy has a significant impact on clinical symptoms, anger control and its components and emotional regulation and its components ($P < 0.01$).

Keywords

Dialectical Behavior Therapy, Clinical Symptoms of Bullying, Anger Control, Emotional Regulation

1. Introduction

Bullying at schools has been currently raised as a global and important problem

in the field of psychology and public health [1]. It is one of the problematic behaviors that has recently attracted the attention of different researchers especially educational psychologists, educational researchers, teachers and parents around the world [2]. Bullying is a deliberate aggressive or annoying behavior that is repeatedly applied by a group or an individual in a period of time and includes the imbalance of power and appears in the form of physical, verbal and communicative behaviors [3]. Briefly, bullying can be defined as a negative deliberate action which is performed with the aim of inflicting physical or psychological injuries on other weaker students who cannot defend themselves [4]. Bullying at school has been considered as a serious personal, social and educational problem which has affected a considerable portion of school students. Effective control of the problem of bullying for school has high priority as much as the school has the responsibility of providing a healthy environment for students so that they learn constructive participation in society [5].

Bullying in boys is three times as much as girls and has been reported to be more severe in early adolescence (11 - 14 years). Bully boys usually annoy both girls and boys, but bully girls do not bully the people of their own sex. Bullying often becomes effective and the victims are from every stratum in terms of age, gender, education and social class; thus, it persists [6].

Bullying is a form of violence which threatens the well-being of adolescents and young people in schools and neighborhoods and may lead to feelings of low self-esteem, fear and humiliation of youths by the aggressive actions of other young people [7]. Bullying people with internalizing disorders have multiple problems including depression, suicidal thoughts, psychosomatic symptoms and feelings of tension and fatigue and bullying individuals with externalized disorders often engage in hyperactive, criminal and aggressive behaviors [7]. [8] has defined anger as a natural emotion and considers it to be severe discomfort and emotional response to the evaluated stimulation. Anger control is one of the issues that has long been raised in the field of psychology.

By anger control skills in this study, it means the skills that Klinke introduced in 1998 to cope with anger and includes the use of social protection systems, problem-solving skills, relaxation skills, skills to maintain internal control, humor skills, speaking skills and effective dialogue, listening skills and clear expression of one's feelings [9]. It can be briefly stated that anger control skill is a kind of cognitive behavioral therapy approach that aims to create changes in the cognition and behavior of individuals [9] and embraces the effective components in interpersonal relationships. For example, [10] conducted a study and assessed the efficiency of anger management skill in reducing the anger expression of patients with schizophrenia. They found that anger management training has been effective in reducing anger expression and increasing the ability to control anger among patients.

The aim of this study is investigating the effectiveness of dialectical behavior therapy in clinical symptoms, anger control and emotional regulation of bully children in Iran.

2. Literature Review

In the following, it should be noted that along with these strategies, emotional regulation can be applied as an anger control skill since emotional regulation has a significant role in developing and maintaining emotional disorders [11]. Since anger is an emotion, emotional regulation can play a crucial role in the transformation of anger. Emotional regulation consists of any coping strategy which is used by individuals when faced with intense emotions [12]. Indeed, emotion regulation refers to the ability to understand emotions, modify the emotional experience and express emotions. Cognitive emotion regulation strategies help people regulate negative emotions and arousals [13]. Notably, difficulty in emotional regulation has been provided as a key component in several models of psychopathology for certain disorders. Disorders such as borderline personality disorder, major depression, bipolar disorder, generalized anxiety, social anxiety, eating disorders and disorders associated with drug and alcohol abuse are among the disorders in which the role of difficulties in emotional regulation has been examined and approved. With regard to what has been mentioned above, it can be said that deficit in emotional regulation can lead to hostile behaviors [14].

Hence, considering the importance of the component of emotional regulation in adjusting and controlling the emotion of anger, getting help from a therapeutic approach which can deal with emotional regulation is of great importance. Accordingly, dialectical behavior therapy (DBT) is one of the new therapeutic approaches whose effectiveness in emotional regulation is very promising [15].

Dialectical behavior therapy is a special kind of cognitive-behavioral psychotherapy which was developed by Marshall Linehan in the late eighties. Dialectical behavior therapy is a cognitive-behavioral approach which emphasizes the psycho-social aspects of treatment [16]. This treatment is an integrated treatment method in which the patient is taught to identify the contradictions within himself and those between himself and the environment and achieve an efficient result through combining and integrating them with each other. In this regard, [17] performed a study and investigated the effectiveness of dialectical behavior therapy with the reliance on the components of distress tolerance and emotional regulation in impulsive behaviors and explosive anger. They came to the conclusion that there is significant difference between the experimental and control groups after the implementation of dialectical behavior therapy in terms of the effect of distress tolerance and emotional regulation on the variables of impulsive behaviors and explosive anger. Ultimately, they stated that dialectical behavior therapy should be used as a helpful and efficient method in improving the inappropriate emotions. [18] observed that dialectical behavior group therapy can lead to improved aggressiveness, difficulties in emotion regulation, distress tolerance and mindfulness of aggressive adolescents.

Outside of Iran, studies have been conducted in this respect including the research done by [19]. In their article, they examined the influence of dialectical behavior therapy on reducing the impulsive behaviors of patients with borderline personality disorder and concluded that dialectical behavior therapy is a

treatment which has a clear structure and uses behavioral techniques and includes dialectical principles and techniques such as self-observation, meditation, exposure and dependency contract. Training these behavioral techniques can help in decreasing the stability of disruptive behavior and impulse control disorders. In a study, [20] evaluated the effectiveness of dialectical behavior therapy in emotional regulation. They came to the conclusion that dialectical behavior therapy is a treatment designed particularly for the individuals who show self-injurious behaviors such as self-injury, suicidal thoughts, desire to commit suicide and suicide attempts. [21] carried out a study and investigated the effectiveness of dialectical behavior therapy for depressed people. He revealed that the use of dialectical behavior therapy skills for the students with emotional dysregulation leads to enhanced management of their negative emotions.

According to the above-mentioned materials and with respect to the effect of dialectical behavior therapy on improving the emotions of individuals, this research seeks to answer the question as to whether dialectical behavior therapy is significantly effective in clinical symptoms, anger control and emotional regulation of bully children.

3. Method, Population and Sample

This research is an applied study in terms of purpose and a quasi-experimental study in terms of data collection method. Also, it is a pretest-posttest study design with a nonequivalent control group. The research statistical population comprises all the bully male students in the schools of District 4 of Mashhad in the academic year 2015-2016. The research statistical sample consists of 24 bully students who were selected from among the male students of District 4 in Mashhad and were assigned into two experimental and control groups (the students have been selected randomly). To this end, purposive sampling method was used. Of these 24 individuals, 12 people were put in the control group and 12 people in the experimental group through available sampling and studies and interventions were conducted only on the subjects of the experimental group for 10 sessions.

To collect the data in the present study, Cognitive Emotion Regulation Questionnaire by Garnefski, Kraaij and Spinhoven, State-Trait Anger Expression Inventory by Spielberger and Bullying Scale by Illinois, Espelage and Holt were applied.

1) Cognitive Emotion Regulation Questionnaire: This scale has been developed by Garnefski, Kraaij and Spinhoven to assess the cognitive strategies used by each individual after experiencing distressing events (events that cause a negative emotional state in the individual). The questionnaire includes 36 items and should be answered based on a graded Likert scale (never = 1, always = 5). It also consists of 9 subscales, each of which evaluates a specific cognitive strategy. The subscales include self-blame, blaming others, acceptance, refocus on planning, rumination, catastrophizing, positive refocusing, positive reappraisal and putting

into perspective. Each scale comprises 4 items and the score of each subscale (in the range of 4 to 20) is obtained through adding the scores given to each item. The sum total of scores ranges from 36 to 180. In examining the test psychometric properties, [22] obtained the test reliability to be respectively 0.91, 0.87 and 0.93 using Cronbach's alpha coefficient. In Iran, the test validity was examined through the correlation between the total score and scores of the test subscales, which ranged from 0.40 to 0.68 with an average of 0.56 and all of them were significant. Moreover, in studying the questionnaire reliability, Cronbach's alpha coefficient was reported to be 0.82 [23].

2) State-Trait Anger Expression Inventory: This questionnaire is a pen and pencil scale which has 57 items and includes six scales and five subscales and its items have been organized into three parts. The first part with the title of "I feel right now" measures the state anger in which the subjects rate the intensity of their feeling based on a four-point scale ranging from "not at all = 1" to "very high = 4". The second part with the title of "I usually feel" and 10 items evaluates the trait anger. The third part with the title of "I'm typically angry, what reaction or behavior I have" assesses anger expression and control and consists of four subscales which are composed of the following items: This part has been graded on a four-point scale ranging from "almost never = 1" to "always = 4" and embraces 32 items. a) anger expression-out (expressed) (AX-O): 27, 31, 35, 39, 43, 47, 51, 55; b) anger expression-in (repressed) (AX-I): 29, 33, 37, 41, 45, 49, 53, 57; c) anger control-out (AC-O): 26, 30, 34, 38, 42, 46, 50, 54; d) anger control-in (AC-I): 28, 32, 36, 40, 44, 48, 52, 56. In this questionnaire, based on the necessity of the research, we use dimensions of internal and external anger control. To calculate the reliability coefficients of each subscale, Khodayari-fard, Gholamali Lavasani, Akbari Zardkhaneh and Liyaqat (2007) applied three methods of Cronbach's alpha, split-half and test-retest (with an interval of two weeks with $N = 60$) whose results for the two components of external and internal anger control are respectively 0.87, 0.84, 0.87, 0.89, 0.84 and 0.87.

3) Illinois Bullying Scale (IBS): Espelage and Holt designed this questionnaire. It has 18 questions which measure three subscales of bullying, fighting and victimization. This questionnaire is based on a five-point Likert scale ranging from never to seven times or more. In this questionnaire, a high score represents high levels of bullying and a low score indicates low levels of bullying in the individual. The score of each subscale is calculated by adding the scores of each relevant question. The highest score that an individual can obtain is 72 and the lowest score is zero. This questionnaire does not have reverse scoring. Espelage and Holt used Cronbach's alpha method to determine the questionnaire reliability, which alpha coefficient for the whole scale was obtained to be 0.83 and for the subscales of bullying, fighting and victimization, it was estimated to be respectively 0.87, 0.83 and 0.88. In Iran, this scale has been standardized by Akbari Baloutbongan and Tale'pasand and Cronbach's alpha coefficient for the whole scale was obtained to be 0.87 and for the subscales of bullying, fighting and victimization, it was reported to be respectively 0.77, 0.71 and 0.76. In their re-

search, the first question of the questionnaire did not have good reliability and was excluded and therefore, the Persian version of this questionnaire was presented with 18 questions.

4. Method of Implementation

After a preliminary study and preparation of tools and referring to the Department of Education to get a license and giving a call to schools and getting their cooperation, the subjects were chosen. The samples were asked by a letter to cooperate regarding the study and were assured sufficiently that their information will remain confidential and will not be shared with others. After conducting the interventions on the experimental group, the questionnaires were collected and the data was analyzed. The educational content of the sessions was that initially, the beginning of each session was allocated to a summary of the previous session's discussions and study of the members' assignments. Objectives of the training sessions are as follows:

First session: Introduction of members, establishing communication, explaining the reason for group therapy and introduction of dialectical behavior therapy (DBT).

Second session: Training basic distress tolerance skills including distraction and self-relaxation.

Third session: Training advanced distress tolerance skills including the visualization of a safe place, discovery of values and confirmative self-talk.

Fourth session: Training basic mindfulness skills including practicing inattention.

Fifth session: Training advanced mindfulness skills including wise mind, fundamental acceptance, non-judgment and daily schedule of mindfulness.

Sixth session: Practicing for more examination of mindfulness and meditation.

Seventh session: Training basic emotional regulation skills including identifying emotions, reducing physical vulnerability in the face of turbulent emotions and reducing cognitive vulnerability.

Eighth session: Training advanced emotional regulation skills including encountering the emotion and acting on strong emotional desires and problem solving.

Ninth session: Training basic effective communication skills including learning skills and passive behavior against aggressive behavior.

Tenth session: Training advanced effective communication skills including presumptuous drafts, bold listening, saying no and method of negotiating.

5. Data analysis Method

The data obtained from the scores of this study is analyzed at two descriptive and inferential levels. At the descriptive level, indicators such as mean, standard deviation, frequency and percentage are used and at the inferential level, analysis of covariance method with the aid of SPSS22 software is applied.

6. Findings

In this study, multivariate analysis of covariance test has been used due to its more suitability and compatibility with the research hypotheses. Before conducting the analysis of covariance test, three assumptions of normal distribution of scores, homogeneity of variances and covariance matrix consistency were investigated whose results have been provided in the following tables (Tables 1-3):

Kolmogorov-Smirnov test results in Table 1 demonstrate that the distribution of scores in all of the research components is normal since the significance level of Kolmogorov-Smirnov test has been obtained to be higher than 0.05 for all components. Therefore, the first assumption has been observed. The results

Table 1. Results of examining the normal distribution of the scores obtained from bullying clinical symptoms, anger control and emotional regulation.

Variable	Dimensions of the variable	Test	Z value	Significance level
Bullying clinical symptoms	Bullying	Pretest	0.692	0.724
		Posttest	0.724	0.672
	Fighting	Pretest	1.024	0.245
		Posttest	0.706	0.701
	Victimization	Pretest	0.892	0.404
		Posttest	1.000	0.270
Anger control	External anger control	Pretest	0.568	0.903
		Posttest	0.768	0.597
	Internal anger control	Pretest	0.758	0.614
		Posttest	0.747	0.633
	Self-blame	Pretest	1.173	0.127
		Posttest	1.015	0.254
Emotional regulation	Blaming others	Pretest	0.900	0.393
		Posttest	0.805	0.537
	Acceptance	Pretest	0.653	0.788
		Posttest	0.692	0.313
	Refocus on planning	Pretest	0.955	0.321
		Posttest	0.852	0.462
Emotional regulation	Rumination	Pretest	0.702	0.708
		Posttest	0.701	0.709
	Catastrophizing	Pretest	0.894	0.401
		Posttest	0.958	0.318
	Putting into perspective	Pretest	0.834	0.490
		Posttest	1.017	0.252
Positive refocusing	Pretest	1.104	0.175	
	Posttest	0.716	0.685	
Positive reappraisal	Pretest	0.952	0.325	
	Posttest	1.041	0.229	

Table 2. Results of examining the homogeneity of variances of bullying clinical symptoms, anger control and emotional regulation.

Variable	Dimensions of the variable	Levene	Degree of freedom 1	Degree of freedom 2	Significance level
Bullying clinical symptoms	Bullying	0.158	1	22	0.695
	Fighting	0.039	1	22	0.845
	Victimization	0.719	1	22	0.406
Anger control	External anger control	2.760	1	22	0.111
	Internal anger control	0.270	1	22	0.608
	Self-blame	0.660	1	22	0.425
	Blaming others	0.247	1	22	0.624
Emotional regulation	Acceptance	1.135	1	22	0.298
	Refocus on planning	0.022	1	22	0.884
	Rumination	0.742	1	22	0.398
	Catastrophizing	0.156	1	22	0.697
	Putting into perspective	0.928	1	22	0.346
	Positive refocusing	0.047	1	22	0.830
	Positive reappraisal	0.207	1	22	0.653

Table 3. Box test to ensure the matrix homogeneity of variances of bullying clinical symptoms, anger control and emotional regulation.

Indicators	F	Degree of freedom 1	Degree of freedom 2	Significance level
Values	1.336	10	2313.944	0.205

presented in **Table 2** suggest that the assumption of the homogeneity of variances has been observed in all components. As can be seen, the results shown in **Table 3** indicate that Box test is not significant ($P = 0.205$, $F = 1.336$). In other words, the matrix of co-variances is homogenous. So, multivariate analysis of covariance test can be performed.

To assess the research hypothesis indicating the effectiveness of dialectical behavior therapy in clinical symptoms of bully children (bullying, fighting and victimization), analysis of covariance method has been employed, whose results are as follows (**Table 4**):

As can be observed, the results obtained from comparing the posttest of bullying clinical symptoms in both groups with controlling the effect of the pretest suggest that after the bully boys' participation in dialectical behavior therapy sessions, their scores in bullying clinical symptoms compared to the control group have had a significant change. So, it can be concluded that dialectical behavior therapy has been effective in significantly reducing the scores of bullying clinical symptoms of bully boys (**Table 5**).

Table 4. Results of covariance analysis for the dependent variable of bullying clinical symptoms.

Variables	Source of changes	Df	F	P-value	Impact factor	Statistical power
Bullying	Group	1	18.624	0.000	0.453	0.983
Fighting	Group	1	19.018	0.000	0.500	0.985
Victimization	Group	1	11.878	0.003	0.385	0.905

Table 5. Adjusted mean and standard deviation of bullying clinical symptoms.

Variable	Dimensions of the variable	Group	Adjusted mean	Adjusted standard deviation
Bullying clinical symptoms	Bullying	Experimental	17.83	1.94
		Control	20.16	2.79
	Fighting	Experimental	10.16	1.46
		Control	12.91	1.67
	Victimization	Experimental	10.66	1.46
		Control	14.50	1.50

As can be observed, the adjusted mean for the score of bullying clinical symptoms (bullying, fighting and victimization) in the experimental group is less than the control group.

In order to examine the research hypothesis suggesting the effectiveness of dialectical behavior therapy in anger control (external and internal anger control), analysis of covariance method has been used, whose results have been provided below (**Table 6**):

As can be seen, the results obtained from comparing the posttest of external and internal anger control in both groups with controlling the effect of the pretest indicate that after the bully boys' participation in dialectical behavior therapy sessions, their scores in external anger control ($P = 0.000$, $F = 20.512$) and internal anger control ($P = 0.000$, $F = 23.184$) compared to the control group have had a significant change. Therefore, it can be concluded that dialectical behavior therapy has been effective in significantly increasing the scores of external and internal anger control of bully boys (**Table 7**).

As can be observed, the adjusted mean for the score of anger control dimensions in the experimental group is higher than the control group.

In order to investigate the research hypothesis indicating the effectiveness of dialectical behavior therapy in emotional regulation (self-blame, blaming others, acceptance, refocus on planning, rumination, catastrophizing, positive refocusing, positive reappraisal and putting into perspective), analysis of covariance method has been applied, whose results have been presented below (**Table 8**):

As can be seen, the results obtained from comparing the posttest of positive emotional regulation dimensions (positive refocusing, positive reappraisal, putting

Table 6. Results of covariance analysis for the dependent variable of anger control dimensions.

Variables	Source of changes	Df	F	P-value	Impact factor	Statistical power
External anger control	Group	1	20.512	0.000	0.533	0.990
Internal anger control	Group	1	23.184	0.000	0.563	0.995

Table 7. Adjusted mean and standard deviation of anger control dimensions.

Variable	Group	Adjusted mean	Adjusted standard deviation
External anger control	Experimental	23.82	0.489
	Control	20.6	0.489
Internal anger control	Experimental	22.76	0.456
	Control	19.57	0.456

Table 8. Results of MANCOVA for the dependent variable of emotional regulation dimensions.

Variables	Source of changes	Df	F	P-value	Impact factor	Statistical power
Positive refocusing	Group	1	44.501	0.000	0.712	1.000
Positive reappraisal	Group	1	31.550	0.000	0.637	1.000
Putting into perspective	Group	1	70.355	0.000	0.834	1.000
Refocus on planning	Group	1	25.375	0.000	0.635	0.996
Self-blame	Group	1	73.051	0.000	0.839	1.000
Blaming others	Group	1	111.047	0.000	0.888	1.000
Acceptance	Group	1	31.320	0.000	0.652	0.995
Rumination	Group	1	52.786	0.000	0.804	1.000
Catastrophizing	Group	1	57.342	0.000	0.804	1.000

into perspective and refocus on planning) and negative emotional regulation dimensions (self-blame, blaming others, acceptance, rumination and catastrophizing) in both groups with controlling the effect of the pretest indicate that after the bully boys' participation in dialectical behavior therapy sessions, their scores in positive emotional regulation strategies (positive refocusing, positive reappraisal, putting into perspective and refocus on planning) and negative emotional regulation strategies (self-blame, blaming others, acceptance, rumination and catastrophizing) compared to the control group have had a significant

change. Hence, it can be concluded that dialectical behavior therapy has been effective in significantly increasing the scores of positive emotional regulation and significantly decreasing the scores of negative emotional regulation of bully boys (**Table 9**).

As can be observed, the adjusted mean for the score of positive emotional regulation dimensions in the experimental group has increased relative to the control group and the adjusted mean for the score of negative emotional regulation dimensions in the experimental group has decreased compared to the control group.

7. Discussion

The present study aims to investigate the effectiveness of dialectical behavior therapy in clinical symptoms, anger control and emotional regulation of bully male students. The obtained results revealed that dialectical behavior therapy has a significant impact on clinical symptoms, anger control and emotional regulation of bully children.

The findings indicating the effectiveness of dialectical behavior therapy in clinical symptoms of bully children are consistent with the results obtained by researchers such as [24] [25] [26] since they also found that dialectical behavior therapy has an impact on clinical symptoms of bully children. In explaining the

Table 9. Adjusted mean and standard deviation of emotional regulation dimensions.

Variable	Dimensions of the variable	Group	Adjusted mean	Adjusted standard deviation
Positive emotional regulation	Positive refocusing	Experimental	13.67	0.577
		Control	10.15	0.577
	Positive reappraisal	Experimental	13.70	0.574
		Control	10.21	0.574
	Putting into perspective	Experimental	14.58	0.531
		Control	10.76	0.531
	Refocus on planning	Experimental	13.14	0.416
		Control	10.43	0.416
Negative emotional regulation	Self-blame	Experimental	8.81	0.710
		Control	14.18	0.710
	Blaming others	Experimental	9.21	0.461
		Control	14.20	0.461
	Acceptance	Experimental	8.82	0.434
		Control	10.84	0.434
Rumination	Experimental	11.09	0.355	
	Control	13.81	0.355	
Catastrophizing	Experimental	11.47	0.397	
	Control	13.73	0.397	

results of the present study indicating the effectiveness of dialectical behavior therapy in clinical symptoms of bully children, it can be said that according to [27], bullying and aggressive behaviors have a significant relationship with emotional dysregulation. Unlike the individuals who are victimized by bullying, bully people less suppress their emotions, especially negative emotions. They express their emotions with less intensity but use cognitive reassessment method and the severity of impulsivity for emotional actions is high in them and they express their negative emotions with more intensity. By creating a sense of fear and threat in others particularly the victims of their bullying, this state can always make them the target of these individuals' bullying. Based on the research evidence, bully students are physically strong and active and also very aggressive and adventurous. Thus, it seems logical that these individuals not to suppress their emotions and since the intensity of their emotional impulses is stronger, they have an internal tendency to dangerous acts and bullying. The lack of weak expression of positive emotions and conversely, strong expression of negative emotions in them cause that others regard them as violent people and submit to their bullying behaviors. This state can be considered as an amplification factor for the continuation of their bullying behaviors. With regard to the mentioned materials, through combining mindfulness exercises and emotion regulation with behavior therapy principles, dialectical behavior therapy teaches the students to observe their own physiological, mental and behavioral consequences with no judgment and to attempt for the unconditional acceptance of these behaviors since tolerance and acceptance of change lead to the experience of their positive emotions. On the other hand, by practicing these components, bully students can learn problem-solving and coping skills in everyday life and in dealing with the situations in which they have had difficulty in terms of emotions and disease symptoms, which is a sort of combination of behavioral and supportive therapy with cognitive problem-solving. In total, reduction in risky behaviors disturbing the quality of life, the ability to solve interpersonal conflicts and improve interpersonal relations of bully children in interaction with peers and parents, increased self-confidence and reduced daily unpleasant experiences, emotional instability and the ability to regulate and adjust negative emotions and their accompanying tension and anger as a result of training these skills cause bully students to enjoy better quality of life and hence, clinical symptoms of bullying are reduced in them.

8. Conclusions

The results of the studies conducted by [28] [29] [30] are congruent with the findings of the present study and accordingly, dialectical behavior therapy is significantly effective in the dimensions of anger control (internal and external anger control). Neacsiu, Rizvi and Linehan performed a study in 2010 entitled "Application of dialectical behavior therapy in the treatment of patients with personality disorder" and demonstrated that dialectical behavior therapy skills lead to reduced depression and increased anger control and have been specifi-

cally effective in reducing self-injury and self-mutilation. Additionally, it can be stated that dialectical behavior therapy is effective in improving the severity of mood and emotions such as emotional instability. In fact, this treatment method provides the clients with a new instrument to express opinions and needs, determine the limitations and discuss the solution to the problem through training interpersonal skills. So, by teaching these skills, this therapy while supporting the relationships of these individuals with others help them respectfully continue these relationships over time. Therefore, dialectical behavior therapy is a treatment that has a clear structure and uses behavioral techniques and includes dialectical principles and techniques such as self-observation, meditation, exposure and dependency contract. Training these behavioral techniques can help in reducing the stability of destructive and aggressive behavior. Considering what has been mentioned so far, the aforesaid hypothesis is confirmed and it can be said that dialectical behavior therapy makes a significant impact on anger control.

Results of the present research indicating the effectiveness of dialectical behavior therapy in emotional regulation are consistent with the studies by [31] [32] [33]. In explaining the results of the present study indicating the effectiveness of dialectical behavior therapy in emotional regulation, it can be stated that dialectical behavior therapy can enhance the therapeutic efficacy due to its underlying mechanisms such as acceptance, increased awareness, the presence at the moment, judgment-free observation and refraining from experiential avoidance. Hence, an increase in psychological flexibility in dialectical therapy and creation of mindfulness-based thinking can promote the patient's ability to cope with difficult and anger-provoking situations. On the other hand, counteraction as one of the most important emotion regulation strategy based on dialectical behavior therapy encourages the patients to perform counteraction against negative emotions (anger). Further, a large number of patients withdraw with the earliest signs of emotional problems. So, assiduous attention to awareness of the present emotions is essential. "Counteraction" in the face of emotions helps the patients remain safe from falling to the bottom and indeed disruptive emotions when experiencing emotional problems [34] [35] [36]. Besides, mindfulness exercises in dialectical behavior therapy skills can help in emotional regulation and flexibility of attention by enhancing the individual's ability to turn the attention from what is unhelpful or ineffective (negative and disruptive emotions) to what is helpful and effective. Based on what has been said above, dialectical behavior therapy can affect the emotional regulation of students and thus, the mentioned hypothesis is confirmed.

9. Limitation

This research was faced with certain limitations including the inattention of some of the subjects participating in the study and also their dishonesty in answering the questionnaire. Moreover, their lack of interest and motivation was a factor that prevented them from appropriate cooperation. Given that therapeutic

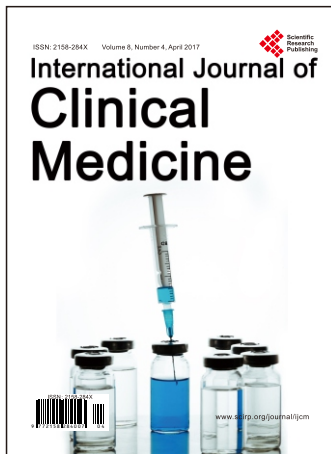
interventions need more time for being effective, the subject should be able to experience the provided trainings outside of the therapy sessions. In this study, the posttest was conducted immediately after completing the training course and it seems that the results should be interpreted with more caution. With regard to the findings of this study, it is recommended that the officials of correction and rehabilitation centers should consider the dialectical behavior therapy program in their long-term planning in order to reduce the frequency of occurrence and decrease the function of coercive behaviors in bully children and should take action to prevent the incidence of personal, family and social consequences following this problem and save in many human and financial costs imposed on the interested institutions and authorities.

References

- [1] Fleming, L.C. and Jakobsen, K.H. (2009) Bullying and Symptoms of Depression in Chilean Middle School Students. *Online Journal Public Health Inform*, **79**, 123-135.
- [2] Kantor, A.M., Hamburger, M.E. and Lumpkin, C.D. (2014) Bullying Surveillance among Youths: Uniform Definitions for Public Health and Recommended Data Elements. *Maternal and Child Health Journal*, **16**, 1625-1635.
- [3] Goodman, M., Carpenter, D., Cheuk, Y., Tang, E., Avedon, J., Fernandez, N., Kathryn, A., Nicholas, J., Blair, S., Antonia, S., Triebwasser, J., Larry, J., Erin, A. and Hazlett, A. (2014) Dialectical Behavior Therapy Alters Emotion Regulation and Amygdala Activity in Patients with Borderline Personality Disorder. *Journal of Psychiatric Research*, **57**, 108-116.
- [4] Ahmed, C. and Braithwaite, U. (2004) Bullying and Victimization: Cause for Concern for Both Families and School. *Social Psychology of Education*, **7**, 35-54. <https://doi.org/10.1023/B:SPOE.0000010668.43236.60>
- [5] AkbariBaloutbongan, A. and Tale'pasand, S. (2015) Psychometric Properties of Harter Bullying Scale in Primary Schools in Semnan. *Journal of Faculty of Health and Institute of Health Research*, **12**, 13-28.
- [6] Aldo, A., Nolen-Hoeksema, S. and Schweizer, S. (2010) Emotion Regulation Strategies across Psychopathology: A Meta Analysis Review. *Clinical Psychological Review*, **30**, 217-237.
- [7] Alijanzadeh, M. (2012) Effectiveness of Dialectical Behavior Group Therapy (Based on Training the Skills) in Adolescents' Aggression. MA Thesis, University of Semnan, Semnan.
- [8] Alilou, M.M. and Sharifi, M.A. (2011) Dialectical Behavior Therapy for Borderline Personality Disorder. Naroudis, Tehran.
- [9] Ben-Porath, D. (2011) Dialectical Behavior Therapy for Depressed Older Adults: A Randomized Pilot Study. *American Journal of Geriatric Psychiatry*, **11**, 33-45.
- [10] Chan, H.Y., Lu, R.B., Tseng, C.L. and Chou, K.R. (2003) Effectiveness of the Anger-Control Program in Reducing Anger Expression in Patients with Schizophrenia. *Archives of Psychiatric Nursing*, **17**, 88-95.
- [11] Fleischhaker, C.H., Bohme, R., Sixt, B., Bruck, C.H., Schneider, C. and Schulz, E. (2011) Dialectical Behavioral Therapy for Adolescents (DBT-A): A Clinical Trial for Patients with Suicidal and Self-Injurious Behavior and Borderline Symptoms with a One-Year Follow-Up. *Child and Adolescent Psychiatry and Mental Health*, **5**, 3.

- <http://www.capmh.com/content/5/1/3>
<https://doi.org/10.1186/1753-2000-5-3>
- [12] Gross, J.J. (2001) Emotion Regulation in Adulthood: Timing Is Everything. *Current Directions in Psychological Science*, **10**, 214-219.
<https://doi.org/10.1111/1467-8721.00152>
- [13] Khodayari-fard, M., GholamaliLavasani, M., AkbariZardkhaneh, S. and Liyaqat, S. (2007) Investigating Psychometric Properties and Standardization of Spielberger State-Trait Anger Expression Inventory-2 among the Students of Tehran University. Research Project, Tehran University, Tehran.
- [14] Klinke Chris, E.L. (2005) Life Skills. The Espandmehr Publication, Tehran.
- [15] Leahy, L. (2012) Emotional Schemas, Emotion Regulation, and Psychopathology. *International Journal of Cognitive Therapy*, **5**, 359-361.
<https://doi.org/10.1521/ijct.2012.5.4.359>
- [16] Linehan, M. and Dexter-Mazze, E. (2008) Dialectical Behavior Therapy for Borderline Personality Disorder. In: Barlow, D.H., Ed., *Clinical Handbook of Psychological Disorders: A Step-by-Step Treatment Manual*, Guilford Press, New York, 365-462
- [17] McKay, M., Wood, J.C. and Brantley, J. (2007) The Dialectical Behavior Therapy Skills Workbook. New Harbinger, Oakland.
- [18] Mcquillan, A., Nicastro, R., Guenot, F., Girard, M., Lissner, C. and Ferrero, F. (2011) Intensive Dialectical Behavior Therapy for Outpatient with Borderline Personality Disorder. *Journal of Psychiatric Services*, **56**, 193-197.
- [19] Nansel, T.R., Overpeck, M., Pilla, R.S., Ruan, W.J., Simons-Morton, B. and Scheidt, P. (2001) Bullying Behaviors among U.S. Youth: Prevalence and Association with Psychosocial Adjustment. *The American Medical Association*, **285**, 2094-2100.
<https://doi.org/10.1001/jama.285.16.2094>
- [20] Neacsiu, A.D., Rizvi, S.H.L. and Linehan, M.M. (2010) Dialectical Behavior Therapy Skills Use as a Mediator and Outcome of Treatment for Borderline Personality Disorder. *Behavior Research and Therapy*, **48**, 832-839.
- [21] Nolen-Hoeksema, S., Wisco, B.E. and Lyubomirsky, S. (2008) Rethinking Rumination. *Perspectives on Psychological Science*, **3**, 400-424.
<https://doi.org/10.1111/j.1745-6924.2008.00088.x>
- [22] Patchin, J.W. and Hinduja, S. (2011) Traditional and Nontraditional Bullying among Youth: A Test of General Strain Theory. *SAGE Journals*, **43**, 727-751.
<https://doi.org/10.1177/0044118x10366951>
- [23] Perepletchikova, F., Axelrod, S.T., Kaufman, J., Rounsaville, B.J., Heather Douglas-Palumberi, H.D. and Miller, A.L. (2011) Adapting Dialectical Behaviour Therapy for Children: Towards a New Research Agenda for Paediatric Suicidal and Non-Suicidal Self-Injurious Behaviours. *Child and Adolescent Mental Health*, **16**, 116-121. <https://doi.org/10.1111/j.1475-3588.2010.00583.x>
- [24] Ragatz, L., Anderson, R., Fremouw, W. and Schwartz, R. (2011) Criminal Thinking Patterns, Aggression Styles, and the Psychopathic Traits of Late High School Ullies and Bully-Victims. Aggressive Behavior, 37 Reliability and Validity. *Psychological Assessment*, **4**, 451-459.
- [25] Videbeck, S.L. (2007) Psychiatric Mental Health Nursing. 3rd Edition, Lippincott Williams and Wilkins, Philadelphia.
- [26] Wagner, A., Rizvi, S.L. and Harned, M.S. (2007) Application of Dialectical Behavior Therapy to the Treatment of Complex Trauma Related Problems: When One Case Formulation Not Fit All. *Journal Trauma Stress*, **20**, 391-400.
<https://doi.org/10.1002/jts.20268>

- [27] Wallace, L.M., Masson, P.C., Safer, D.L. and von Ranson, K.M. (2014) Change in Emotion Regulation during the Course of Treatment Predicts Binge Abstinence in Guided Self-Help Dialectical Behavior Therapy for Binge Eating Disorder. *Journal Eating Disorder*, **2**, 35. <https://doi.org/10.1186/s40337-014-0035-x>
- [28] Yousefi, F. (2006) Assessing the Relationship between Cognitive Emotion Regulation Strategies with Depression and Anxiety in Students of Guidance Centers of Talented Students. *Research Journal in the Domain of Exceptional Children*, **6**, 871-892.
- [29] Zamani, N., Farhadi, M., Jamilian, H.R. and Habibi, M. (2014) Effectiveness of Dialectical Behavior Therapy with the Reliance on the Components of Distress Tolerance and Emotional Regulation in Impulsive Behaviors and Explosive Anger. *Journal of Arak Medical Sciences University*, **17**, 53-61.
- [30] Rubin, K.H., Burgess, K.B., Dwyer, K.M. and Hastings, P.D. (2003) Predicting Preschoolers Externalizing Behaviors from Toddler Temperament, Conflict, and Maternal Negativity. *Development Psychology*, **39**, 164-176. <https://doi.org/10.1037/0012-1649.39.1.164>
- [31] Soler, J., Pascuala, J.C., Barrachina, J., Alvarez, E. and Perez, V. (2013) Double Blind Placebo Controlled Study of Dialectical Behavior Therapy Plus Olanzapin for Borderline Personality Disorder. *American Journal of Psychiatry*, **162**, 1221-1224.
- [32] Soler, J., Valdepérez, A., Feliu-Soler, A., Pascual, J.C., Portella, M.J., Martín-Blanco, A., Alvarez, E. and Pérez, V. (2012) Effects of the Dialectical Behavioral Therapy-Mindfulnessmodule on Attention in Patients with Borderline Personality Disorder. *Behaviour Research and Therapy*, **50**, 150-157.
- [33] Stephanie, D., Ameer, J., Seungmin, J. and Timothy, J. (2008) The Effectiveness of Dialectical Behavioral Therapy Skills Use on Borderline Personality Disorder. *Journal of Psychiatric Research*, **22**, 549-563.
- [34] Stern, S.B. (1999) Anger Management in Parent Adolescent Conflict. *The American Journal of Family Therapy*, **27**, 181-193. <https://doi.org/10.1080/019261899262050>
- [35] Trupin, E.W., Stewart, D.G. and Boesky, L. (2002) Effectiveness of a Dialectical Behaviour Therapy Program for Incarcerated Female Juvenile Offenders. *Child and Adolescent Mental Health*, **7**, 121-127.
- [36] Vanden, B., Verhuel, R., Schippers, G.M. and Brink, W. (2002) Dialectical Behavior Therapy of Borderline Patient with and without Substance Use Problems Implementation and Long-Term Effects. *Journal Addictive Behavior*, **27**, 911-923.



International Journal of Clinical Medicine

ISSN: 2158-284X (Print) ISSN: 2158-2882 (Online)

<http://www.scirp.org/journal/ijcm>

International Journal of Clinical Medicine (IJCM) is a peer reviewed journal dedicated to the latest advancement of clinical medicine. The goal of this journal is to keep a record of the state-of-the-art research and to promote study, research and improvement within its various specialties.

Subject Coverage

The journal publishes original papers including but not limited to the following fields:

- Allergy and Clinical Immunology
- Cancer Research and Clinical Oncology
- Clinical Anaesthesiology
- Clinical Anatomy
- Clinical and Applied Thrombosis/Hemostasis
- Clinical and Experimental Allergy
- Clinical and Experimental Dermatology
- Clinical and Experimental Hypertension
- Clinical and Experimental Immunology
- Clinical and Experimental Medicine
- Clinical and Experimental Metastasis
- Clinical and Experimental Nephrology
- Clinical and Experimental Ophthalmology
- Clinical and Experimental Optometry
- Clinical and Experimental Otorhinolaryngology
- Clinical and Experimental Pathology
- Clinical and Experimental Pharmacology and Physiology
- Clinical and Molecular Allergy
- Clinical and Translational Oncology
- Clinical Anesthesia
- Clinical Apheresis
- Clinical Autonomic Research
- Clinical Biochemistry and Nutrition
- Clinical Biomechanics
- Clinical Cardiology
- Clinical Case Studies
- Clinical Child Psychology and Psychiatry
- Clinical Chiropractic
- Clinical Densitometry
- Clinical Effectiveness in Nursing
- Clinical Endocrinology and Metabolism
- Clinical Epidemiology
- Clinical Forensic Medicine
- Clinical Gastroenterology and Hepatology
- Clinical Genetics
- Clinical Haematology
- Clinical Hypertension
- Clinical Imaging
- Clinical Immunology
- Clinical Implant Dentistry and Related Research
- Clinical Interventions in Aging
- Clinical Laboratory Analysis
- Clinical Linguistics & Phonetics
- Clinical Lipidology
- Clinical Microbiology and Antimicrobials
- Clinical Microbiology and Infection
- Clinical Microbiology and Infectious Diseases
- Clinical Molecular Pathology
- Clinical Monitoring and Computing
- Clinical Neurology and Neurosurgery
- Clinical Neurophysiology
- Clinical Neuropsychology
- Clinical Neuroradiology
- Clinical Neuroscience
- Clinical Nursing
- Clinical Nutrition
- Clinical Obstetrics and Gynaecology
- Clinical Oncology and Cancer Research
- Clinical Ophthalmology
- Clinical Oral Implants Research
- Clinical Oral Investigations
- Clinical Orthopaedics and Related Research
- Clinical Otolaryngology
- Clinical Pathology
- Clinical Pediatric Emergency Medicine
- Clinical Periodontology
- Clinical Pharmacology & Toxicology
- Clinical Pharmacy and Therapeutics
- Clinical Physiology and Functional Imaging
- Clinical Practice and Epidemiology in Mental Health
- Clinical Psychology and Psychotherapy
- Clinical Psychology in Medical Settings
- Clinical Radiology
- Clinical Rehabilitation
- Clinical Research and Regulatory Affairs
- Clinical Research in Cardiology
- Clinical Respiratory
- Clinical Rheumatology
- Clinical Simulation in Nursing
- Clinical Sleep Medicine
- Clinical Techniques in Small Animal Practice
- Clinical Therapeutics
- Clinical Toxicology
- Clinical Transplantation
- Clinical Trials
- Clinical Ultrasound
- Clinical Virology
- Complementary Therapies in Clinical Practice
- Consulting and Clinical Psychology
- Contemporary Clinical Trials
- Controlled Clinical Trials
- Diabetes Research and Clinical Practice
- Evaluation in Clinical Practice
- Fundamental & Clinical Pharmacology
- Hereditary Cancer in Clinical Practice
- Human Psychopharmacology: Clinical and Experimental
- Innovations in Clinical Neuroscience
- Laboratory and Clinical Medicine
- Neurophysiologie Clinique/Clinical Neurophysiology
- Nutrition in Clinical Practice
- Pacing and Clinical Electrophysiology
- Psychiatry in Clinical Practice
- Therapeutics and Clinical Risk Management
- Veterinary Clinical Pathology

We are also interested in short papers (letters) that clearly address a specific problem, and short survey or position papers that sketch the results or problems on a specific topic. Authors of selected short papers would be invited to write a regular paper on the same topic for future issues of the **IJCM**.

Notes for Intending Authors

All manuscripts submitted to IJCM must be previously unpublished and may not be considered for publication elsewhere at any time during IJCM's review period. Paper submission will be handled electronically through the website. All papers are refereed through a peer review process. Additionally, accepted ones will immediately appear online followed by printed in hard copy. For more details about the submissions, please access the website.

Website and E-Mail

<http://www.scirp.org/journal/ijcm>

Email: ijcm@scirp.org

What is SCIRP?

Scientific Research Publishing (SCIRP) is one of the largest Open Access journal publishers. It is currently publishing more than 200 open access, online, peer-reviewed journals covering a wide range of academic disciplines. SCIRP serves the worldwide academic communities and contributes to the progress and application of science with its publication.

What is Open Access?

All original research papers published by SCIRP are made freely and permanently accessible online immediately upon publication. To be able to provide open access journals, SCIRP defrays operation costs from authors and subscription charges only for its printed version. Open access publishing allows an immediate, worldwide, barrier-free, open access to the full text of research papers, which is in the best interests of the scientific community.

- High visibility for maximum global exposure with open access publishing model
- Rigorous peer review of research papers
- Prompt faster publication with less cost
- Guaranteed targeted, multidisciplinary audience



**Scientific
Research
Publishing**

Website: <http://www.scirp.org>

Subscription: sub@scirp.org

Advertisement: service@scirp.org