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## CONFERENCE PROCEEDINGS

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Colombo, Sri Lanka

Committee of the WDRC- 2016

The International Institute of Knowledge Management (TIKM)

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# SOCIAL AND PSYCHOLOGICAL FEATURES OF DISABLED STUDENTS' INTEGRATION IN THE INCLUSIVE GROUPS

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## Abstract

The aim of the research: Training in the inclusive higher school environment supposes joint training of higher school students with functional limitations, with other students in the integrated group. Social and psychological aspects of this phenomenon are studied insufficiently. In particular, the study of the acceptance degree of a student with disabilities in an inclusive group needs special attention. The indicators of sociometric status of a student with disabilities can help determine how well they are included in the team, how well they are accepted in the group. They also help assess the effectiveness of integration into the society at large. We should also note that the success of the actions of young people with disabilities will largely depend on their willingness to be active, able to initiate their own development, and act as a source and the cause of their own behavior, to overcome the negative impact of a situation of uncertainty, i.e. on the ability to self-determination.

Methods: The sociometric test for the diagnostics of emotional links between members of the inclusive group, tests, studying personal self-actualization, method of studying the training motivation in higher school.

Main results: we identified specificity of emotional interaction between the members of an inclusive group. The features of the personal potential of students with disabilities in comparison with healthy students were shown. Differences in educational motivation are presented.

Conclusions: The position of a student with disabilities in the inclusive group has sociometric status of the one "who joined" or "isolate". That is the level of unity of inclusive groups is insufficient. The level of self-actualization of students in the inclusive groups depends on various conditions within the group and on the specific health problems. At the same time students with disabilities devote a driving position to motivation of acquiring knowledge and mastering profession in the hierarchy of motives.

**Keywords:** Inclusive education, inclusive groups, self-actualization, motivation, sociometric status.

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## INTRODUCTION

Education of students with disabilities is the subject of an old and extensive discussion in a professional community of many countries [20, 21, 35, 51, 53, 56]. In Russia, inclusive education development dates back to 2012 when the country joined the UNO Convention on the Rights of Persons with Disabilities [11]. On June 1, 2012 the Decree of the Russian Federation on the rights of persons with limited health opportunities to receive inclusive education of

all levels came into effect [8].

The practice of inclusive education as a mass phenomenon is only at its initial stage of development at higher school of Russia. Mechanisms of educational process adaptation to individual educational needs of each student having various forms of disability are being created; tasks of all experts participating in creation of inclusive practice of higher education are being specified [1-3, 4, 5, 26, 43, 44, 45, 54]. Experience of countries with a long history of training students with limited health

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possibilities (LHP) shows: teachers of higher education institutions play a leading role in disabled students' inclusion both in educational process and extra curricula activities [7, 15, 25, 39]. The pedagogical community of Russia widely discusses issues of experts' training improvement in the field of teaching children and adults with LHP [18, 19, 32, 50].

A versatile study of LHP students' psychological wellbeing in the context of inclusive training, opportunities for self-actualization in learning and social contacts make an important component for creation of a new practice in higher education institutions of Russia. The issue of self-actualization proposed by American psychologists-humanists [28] is widely researched in higher education of Russia. The theory of personality development considers self-actualization as person's aspiration to continuous individual development, effective realization of potentials in the course of activity aimed to achieve public recognition [41]. Models of conditions to develop students' self-actualization are suggested; the role of higher school teachers in this process is being studied [6, 40]. Key tendencies of modern Russian students' self-actualization are being revealed in different spheres of their vocational training [24, 36].

Adaptation educational programs for LHP students include disciplines promoting self-awareness and self-actualization [26, 27].

At the same time empirical researches of LHP students' self-actualization are quite limited [38, 55].

Inclusive practice imposes high demands for all participants of an educational process. LHP students are required to mobilize intellectually and psychologically. In this regard, the problem of LHP students' motivation to study at a higher education institution turns to be extremely important.

Educational motivation is defined as a specific type of motivation included in learning activity [14, 33, 34]. Pedagogical conditions and means to increase motivation of LHP students are discussed within the frames of inclusive education research; however the number of psychological researches of disabled students' learning motivation at a higher education institution is not enough [37, 52].

Some empirical researches compare learning motivation of LHP students and students without disability. There are data that disabled people have higher motivation for learning, they are more conscientious when doing their tasks. Motives of prestige and social motives are significantly higher in the structure of educational motivation of students with hearing disorder than students without impairment. Motives of creative self-realization and communicative motives of students with hearing disorder take the first place in the hierarchy of educational activity motives; "healthy" students consider professional motives as more important [23, 47].

Relationships with teachers, heads and personnel of an educational organization determine psychological availability: general positive thinking and friendly atmosphere for LHP students. Social and psychological situation in group where there are students with special educational needs is its major component [16, 17].

Desire to take a certain place in a group is an important feature of student's age; the sociometric status is a recognized indicator to assess the quality of group relations in general, and situations for its each member. The following is widely studied at a high school: the degree of internal satisfaction of popular students and students who are not accepted by the group; a psychological portrait, psychological structure of proneness to conflicts, academic success of students with various status in the group; personal determinants of low sociometric status; the ratio of cooperation and competition in interpersonal relations in a student group [9, 10, 12, 22, 29, 42, 49].

At the same time, researches of sociometric characteristics of LHP persons in a student group are sporadic; results are often contradictory. There are some data about the way students with visible forms of disability are accepted by other students, and that disabled people have the status of rejected, and they are more often isolated. Comparative researches show that a lower sociometric status of students with special educational needs is characteristic for higher education institutions that are not specialized on training of LHP people and those located in towns [13, 30, 46, 48]. In general, studying of social and psychological features of disabled students'

integration into educational space of higher school in Russia is obviously insufficient.

The aim of the research is to study features of social and psychological integration of disabled students in an inclusive student's group through indicators of self-actualization, educational motivation and sociometric status.

## MATERIALS AND METHODS

6 academic groups from higher education institutions of Kazan participated in the research; all in all there were 59 students, 11 students are LHP students. The following parameters were studied: features of LHP students' interpersonal relationships situations (Moreno's method of sociometry); the level of students' in norm and LHP students' self-actualization within inclusive education (Shostr, Alyoshina, Zagik, Gozman & Kroz). Also, Ilyina's technique of studying learning motivation at a higher education institution was applied to identify the prevailing type of learning motivation at a higher education institution.

The method of sociometry included 4 groups of questions: 1. desire/unwillingness to share the same desk; 2. desire/unwillingness to ask questions and problems; 3. desire / unwillingness to communicate at

an education institution; 4. desire/unwillingness to communicate in social networks. The following sociometric indicators were specified: expansiveness, positive and negative; integration, positive and negative; unity. The level of self-actualization was measured according to two basic and 12 additional scales, independent from each other: valuable orientation, flexibility of behavior, sensitivity to oneself, spontaneity, self-esteem, self-acceptance, ideas of human nature, synergy, acceptance of aggression, sociability, cognitive requirements, creativity. The level of motivation was determined according to three scales: "Acquisition of knowledge" (aspiration to obtain knowledge, inquisitiveness); "Mastering a profession" (aspiration to master professional knowledge and create professionally significant qualities); "Getting a Degree" (wish to get a Degree upon formal assimilation of knowledge, wish to find alternative ways to pass examinations and tests).

All obtained results were analyzed with Statistika 6 program application.

## RESULTS

Fig. 1 shows the analysis of sociometric data reflecting expansion, integration and unity in inclusive groups in general.

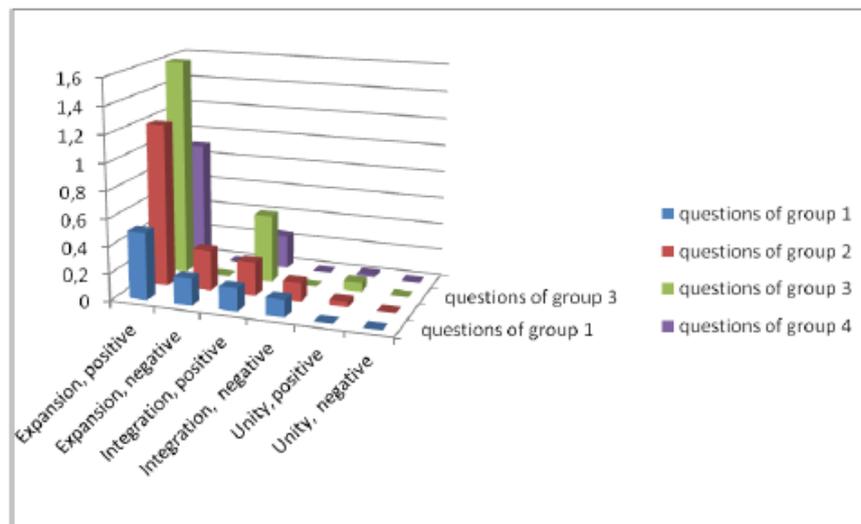


Figure 1. Indicators of expansiveness, integration and unity in inclusive student's groups

The maximum positive expansiveness and the absence of the negative one are revealed when

students communicate informally at an institute and in social networks (groups of questions 3 and 4).

Students of inclusive groups are more selective in educational (group of questions 2) and especially close communication (the 1st group of questions).

The ratio of *integration* indicators is similar to *expansion* indicators, but has quite a smaller value. That is, inclusive groups of students are more integrated at informal communication and in social networks. At the same time, total absence of unity which characterizes the sphere of the closest communication and contacts in social networks (group of questions 1 and 4) is specified.

Let us consider individual sociometric indices. It was revealed that LHP students have *zero values of indices of sociometric status* (both positive and

negative) in group of questions 1, 2 and 4. No one of group members mentions who they want to sit at the desk next to, but does not speak about refusal to sit with them either. Groups do not apply with questions and difficulties arising in their study, but at the same time they do not refuse to address in such occasions; they do not communicate in social networks and do not refuse to see LHP students among their friends. That is, other group members do not choose, do not show activity, initiative in relation to HLP students and do not reject them.

Let us further analyze the degree of students' self-actualization in inclusive groups (Fig. 2).

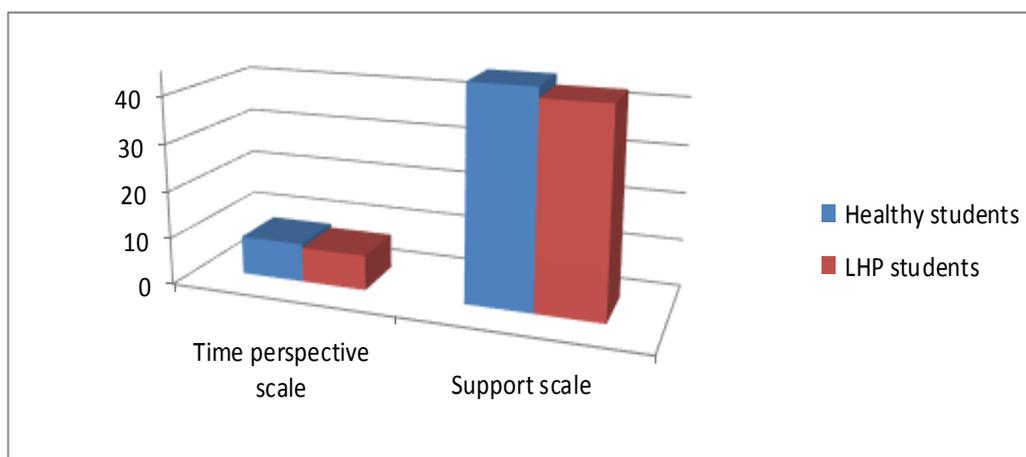


Figure 2. Average values of main scales of "Self-actualization Test" technique

According to the scale time perspective LHP students (7.4) and "healthy" students have close values within average limits (maximum value according to this scale is 17 scores). The obtained result demonstrates that both "healthy" students and LHP students are capable to take their life on the whole, inseparable from past, future and present. That very life and world perception testifies to a quite high level of personality self-actualization. Let us note that the more vivid difference of students' answers was revealed despite high values on the scale support which vary within above average in relation to maximum possible (92 scores). "Healthy" students

(50,1) has higher indicator value than LHP students (42,8). It points out that "healthy" students are relatively independent from outside impacts in their actions and strive to follow their principles and sets. LHP students are characterized by less independence that means a high degree of dependence and conformity, and shows LHP students' dependence on external circumstances. Such external locus of control specifies the fact that LHP students' personal choice is influenced by external circumstances.

Fig. 3 presents the ratios that students of various types of learning motivation have at a higher education institution (Ilyina's technique).

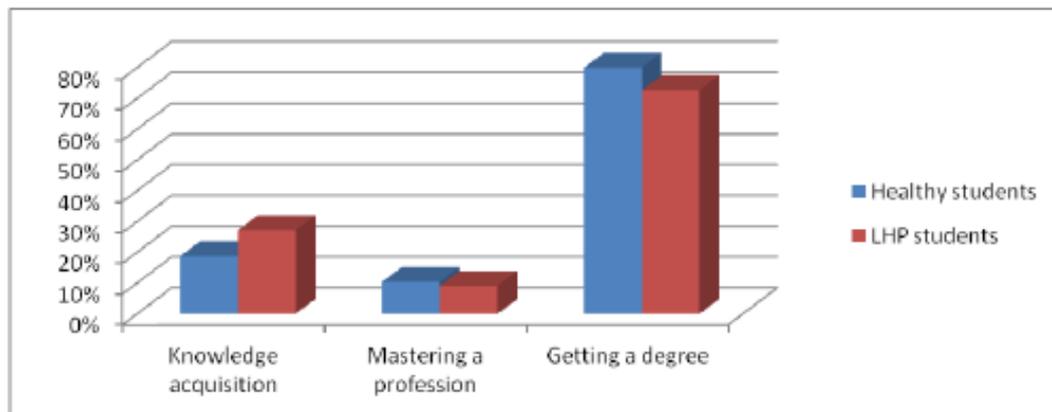


Figure 3. A ratio of various types of learning motivation at a higher education institution (Ilyina's technique)

The leading motivation of the majority of “healthy” students (81.2%) and LHP students (72.7%) is getting a degree, though LHP students consider this socializing motive as less significant. The motivation mastering a profession is less expressed; it mostly concerns LHP students (9.1% in comparison with 10.4% of “healthy” students). At the same time LHP students’ aspiration to obtain knowledge is higher than in the sample of “healthy” students (27.2% in comparison with 18.8% of healthy students). In general, LHP students and “healthy” students are alike when it concerns the hierarchy of learning motives at a higher education institution. In both cases the motivation getting a degree is prevailing; it indicates that young people do not consider higher education as a stage of their career and vocational growth but as a final socially substantiated goal. LHP students’ lower motivation mastering a profession is caused by less freedom when they choose a higher education institution, specialized training and opportunities of further professional growth. At present not all higher education institutions, not all training directions are available for LHP students; besides not all employers are ready to provide such people with workplaces. Despite this fact, LHP students’ motivation obtaining knowledge is higher; they are more knowledge oriented. Thus, LHP students’ motivation of studying at a higher education institution is supposed to be more auspicious in comparison with “healthy” students.

Conclusion. The research results showed that inclusive groups of students are more integrated at informal communication and in social networks. The sociometric status of LHP students is the following:

they take the position of an adjoined peripheral group member more often, they do not receive negative choices, but at the same time they get a positive choice only in the sphere of communication in social networks. Let us also note that insufficient integration into a group characterizes not only LHP students but “healthy” students as well.

The research of students’ self-actualization in inclusive groups showed that on the scale time perspective LHP students and “healthy” have close indicators; their perception of life is holistic, they live now and here; that testifies to a rather high level of personality self-actualization. It was revealed that LHP students are less independent.

The research of learning motivation showed that motivation getting a degree is prevailing both for most “healthy” students and LHP students. LHP students are focused on knowledge acquisition, and “healthy” students are oriented to mastering a profession. Therefore, the system of LHP students’ learning motivation at a higher education institution can be considered as more auspicious in comparison with “healthy” students’ motivation.

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# CATEGORISATION OF PEOPLE WITH PHYSICAL DISABILITIES TO HELP WORK IN INDUSTRY

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## Abstract

People with disabilities (PWDs) account for about 15% of the world population, and they need to be provided with opportunities for comfortable living. There are reported models to categorise PWDs, but none support to identify their capabilities and limitations. This has limited their employability with their residual capabilities depriving them of an independent life. Literature suggests a multi-dimensional model to enable them to be employed. Thus, the aim of this research was to categorise people with physical disabilities (PPDs) based on their capabilities for performing work activities in industry. First, typical manual work-tasks in industry were identified from work activities prescribed in Pre-determined Motion Time Systems (PMTS). Then, Ranges of Motion (ROM) associated with each of the body regions were captured and refined using a walkthrough and interview approach with Consultant Orthopaedic Surgeons (n = 6) and Prothetists and Orthotists (n = 3). Body regions and joints both in the upper and lower extremities required for performing work activities in industry were identified. Finally, ROM required for performing PMTS activities were mapped by selecting a sample of PPDs (n = 92). This categorisation is expected to be used by potential employers to recruit PPDs based on their residual capabilities to perform work-tasks, identify training needs of PPDs and to decide on assistive devices and special facilities to help them independently carry out work activities. Further research is needed to use the categorisation in an industrial setting to evaluate its feasibility as a tool to help recruitment of PPDs.

**Keywords:** People with physical disabilities, range of motion, employment

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## INTRODUCTION

People with disabilities (PWDs) constitute 15% of the world population (Guimarães, 2015, WDR, 2011 and Mirrales et al., 2007). Literature suggests that PWDs are willing to work if they are recruited to organisations (Newton et al., 2007). Citing from previous research (Chen and He, 1997), two-thirds of PWDs desire to work if appropriate job opportunities are available. Thus, it is clear that PWDs need to be provided with necessary support and guidance to work effectively (Abeykoon et al., 2013 and Chi et al., 2004).

Disabilities modify activities of the daily lives of the PWDs, but do not destroy their ability to work (Doyle, 1987) and therefore discussions have been in existence since mid-20th century regarding

employment of PWDs (Aytac et al., 2012). However, literature reveals that neither employers nor the PPDs know their potential contribution to organisations since both parties do not have a thorough idea of capabilities and limitations of PWDs (Chen & He, 1997 citing Tompkins, 1993). By reviewing previous research, Chi et al. (2004) list the beliefs of colleagues and superiors about limited work performance ability of PWDs. For instance, people in wheelchairs are unproductive or lacked efficiency (Pointer and Kleiner, 1997); employment and training of PWDs is a tough task (Guimarães, 2015). Therefore, employment of PWDs in organisations has to be facilitated. In order to facilitate recruitment, the employers need to be able to identify capabilities and limitations of the recruits (Vincent-Onabajo and Malgwi 2015, Abeykoon et al., 2013). Guimarães (2015) also stresses that it is important to understand

the interaction between PWDs and the elements of work systems.

With the intention of improving the chances of employing PWDs in industry, models to categorise PWDs, namely, medical model, social model and stigma model (Sairam, 2008 and Thanem, 2008) have been researched. Rejecting the above three models, embodied model (Thanem, 2008) is identified as useful for accommodating disability in diversity management research since this recognises bodily aspects of disability in workplace. There are also employment models for PWDs in practice: subsidised, sheltered, designated and supported (Skedinger and Widerstedt, 2007 and Barnes, 1992). These are further categorised into seven models of employing PWDs (Aytac et al., 2012): quota system, sheltered workshops, self-study method, employment of the disabled without the obligation of employers, working at home, cooperative working method and employment in selected jobs where only disabled people are employed. However, none of the aforementioned models support to identify their capabilities and limitations in performing industrial activities. Furthermore, there is the common notion that the cost and energy spent on vocational training have a negative impact despite the education and training being provided for PWDs leading towards employability (Yusof et al., 2014). These have limited their employability depriving them of an independent life.

With the intention of improving the ability of a portion of PWDs to work in industry, this research study aims to categorise people with physical disabilities (PPDs) based on their capabilities and limitations to perform manual work-activities in industry. The objectives were to: identify typical manual work-activities prevalent in industry, determine body regions/joints and the ranges of motion (ROM) required to perform the manual work-activities, and to categorise PPDs with respect to their ability to perform the manual work-activities.

## METHODOLOGY

The study was carried out in three phases. In the first phase, typical manual work-activities were selected from methods-time measurement (MTM) 1 and MTM 2, which are commonly known as predetermined

motion time systems (PMTS) (ILO, 1992, Mundel, 1981, and Barnes, 1968). They were then refined with 20 rounds of discussions with Industrial Engineers (n = 2).

In the second phase, body regions/joints and their ROM, which are useful for carrying out manual work-activities were identified through a literature review and then refined in 20 steps by consultant orthopaedic surgeons (n = 6), and prosthetists and orthotists (n = 3) who were selected using a snowballing sampling approach. The set of body regions/joints and their ROM were evaluated at the end of each step by another consultant orthopaedic surgeon who acted as a moderator. The final document was observed for concurrence by all the participants.

After obtaining ethical clearance from the Medical Research Institute (MRI) of Sri Lanka, in the third phase, a pilot study was carried out using PPDs (n = 3) and minor adjustments were made to the study protocol. Then the full-scale study involving PPDs in their working age (18-55 years) who had both congenital and acquired physical disabilities having only non-progressive, orthopaedic and mobility impairments (n = 92) was carried out. In this study, anthropometric (using a set of Harpenden anthropometers) and ROM (using a JAMAR set of goniometers) data of disabled or deformed body regions (i.e. length discrepancy, limb loss, angular displacement and rotational displacement) were obtained. Deformity or disability conditions in both upper and lower extremities were identified and recorded. After recording the ROM of body regions/joints affected by the disabilities of all participants, they were categorised according to work-activities that can be performed despite the residual disability. This was performed through direct observations and unstructured interviews with the orthopaedic surgeon who acted as the moderator in phase 2 of the study.

## RESULTS

According to MTM 1 classification, reach, move, turn, apply pressure, grasp, position, release and disengage were identified as manual work-activities performed by the upper extremity. From MTM 2, get, re-grasp and crank were added to the list of work-

activities. Grasp/get activity was further divided into no grip, power grip, precision grip and power and precise grip. Identified activities performed by the lower extremity were step climbing, step walking, ankle and foot motions (machine pedalling).

Ten body regions/joints in the upper extremity which are important to perform manual work-activities (i.e. shoulder, elbow, forearm, wrist, joints of thumb, index finger, middle finger, ring finger and little finger) were identified. The four body regions/joints identified in the lower extremity were hip, knee, ankle and foot.

In the sample of PPDs, there were 40% with disabilities in the upper extremity only. It was 39% for the disabilities in the lower extremity only. There

were 29 PPDs with congenital and 46 PPDs with acquired disorders. The remaining 17 PPDs were amputees. Among the 92 participants, disabilities were found in 245 body regions/joints. The participants had 1819 instances of limited or no ROM useful for work.

Table 1 summarises the disabilities that were present among the sample of PPDs and lists the corresponding work-activities that can be performed with the residual disabilities. For instance, there were 17 subjects with deformities in the shoulder. None of them were able to perform any activity, which required the shoulder since they all have limited or no shoulder ROM. However, they were capable of performing manual work-activities that do not involve shoulder movement.

Table 1: Work capability analysis of study participants

Deformed body region/joint	No. of instances	Work capabilities (for upper extremity)
Shoulder	17	Turn, apply pressure, percussive, sustained, hammering/ tapping, cylindrical gripping, spherical grip, disc grasping, screw-driving, fingertip gripping, pinch gripping, key grip, complex (pen), claw grip, re-grasp, position, release and disengage.
Elbow	23	Percussive, sustained, hammering/ tapping, spherical grip, disc grasping, fingertip gripping, pinch gripping, complex (pen), re-grasp, crank, stirring, position, release and disengage.
Forearm	23	Percussive, sustained, hammering/ tapping, spherical grip, disc grasping, fingertip gripping, pinch gripping, complex (pen), claw grip, re-grasp, crank, stirring, position, release and disengage.
Wrist	30	Spherical grip, disc grasping, fingertip gripping, claw grip.
Thumb	35	Reach, move, turn, sustained.
Index finger	33	Reach, move, turn, apply pressure, release and disengage.
Middle finger	30	Reach, move, turn, apply pressure, disc grasping, pinch gripping, key grip, re-grasp, crank, stirring, release and disengage.
Ring finger	28	Reach, move, turn, apply pressure, disc grasping, screw-driving, shearing, fingertip gripping, pinch gripping, key grip, complex (pen), re-grasp, crank, stirring, release and disengage.
Little finger	25	Reach, move, turn, apply pressure, percussive, sustained, hammering/ tapping, spherical grip, disc grasping, screw-driving, shearing, fingertip gripping, pinch gripping, key grip, complex (pen), re-grasp, crank, stirring, release and disengage.
Lower extremity	36	Reach, move, turn, apply pressure, percussive, sustained, hammering/ tapping, cylindrical gripping, spherical grip, disc grasping, screw-driving, shearing, fingertip gripping, pinch gripping, key grip, complex (pen), claw grip, re-grasp, crank, stirring, position, release and disengage.

By further scrutinising collected data, it was found that out of the 92 PPDs that participated in the study, 16% were unable to perform any form of physical work-activities, which means that 84% were capable of performing one or more manual work-activities.

## DISCUSSION

Currently both employers and employees with physical disability face difficulties in employment of PPDs. On one hand, the employers are not clear on mapping the available work-activities with capabilities and limitations of PPDs. On the other, PPDs do not know the work-activities that they can perform in industry. Supporting this, Guimarães (2015) explain that despite the attempts to employ PWDs in workplaces, employment percentage remains low. This research fills this gap by attempting to categorise a sample of PPDs based on their ability to perform typical manual work-activities.

There are two categories of physical disabilities identified as congenital and acquired (Bonnici et al., 2009 and Pointer and Kleiner, 1997). However, the effect of these to ROM necessary to carry out work is similar. Body movements of human anatomical regions/limbs occur around movable joints and each movable joint allows certain types of movements, which are useful in physical activities (Pandey and Pandey, 2009, Martini and Bartholomew, 2000, Hignett and McAtamney, 2000, Sanders and McCormick, 1993 and Schoenmarklin and Marras, 1993). ROM of joints and static anthropometric data are useful in determining work-space envelope (Chung and Wang, 2009 and Sanders and McCormick, 1993). This provides justification for considering people with both congenital and acquired disabilities together in this study.

Ten body regions were identified as essential for carrying out manual work-activities in the upper extremity and the limitations of a given participant was categorised based on the ROM. ROM is defined as the amount of movement through a particular plane that can occur. It depends on the bone structure of the joint, amount of bulk (muscle or other tissue) near the joint, and elasticity of muscles, tendons and ligaments around the joint (Pandey and Pandey, 2009, Martini and Bartholomew, 2000, Hignett and

McAtamney, 2000, Sanders and McCormick, 1993 and Schoenmarklin and Marras, 1993). Therefore, using ROM as an indicator of disability is justified.

It was sometimes difficult to identify body regions/joints of persons with congenital physical disability based on their deformity, limitations in angular rotation of bones and dislocation of joints. This was due to adaptation of the body to carry out manual tasks. Therefore, measurement of the muscle power on top of the ROM (James, 2007 and Florence et al., 1992) for cumulative assessment of anatomical movements of the human body in order to fully judge a disability can be important. However, obtaining the muscle power grading needs specialised knowledge and has practical difficulties. Thus, the parameters identified in this multi-dimensional model were only anthropometric information and ROM.

One other limitation of the study is the consideration of only PPDs. The assessment of the ability to engage in manual work of people with other forms of disabilities such as nervous, visual and auditory requires different test batteries and was considered as beyond the scope of this research. In addition, it was thought that employing people with other forms of disabilities to carry out manual work-activities can be dangerous and give rise to health and safety related issues.

## CONCLUSION

In the current study to categorise people with physical disabilities, there were 63 subjects with acquired and 29 with congenital disabilities. Nine participants with congenital physical disabilities had disabilities in both upper and lower extremities. Out of 92 study participants, disabilities were found in 245 body regions/joints. Although they had 1819 limited or no ROM useful for work, they are able to carry out a part of typical work-activities in industry with their residual capabilities. The findings provide impetus for further research to formulate guidelines for the employers to identify and evaluate capabilities of people with physical disabilities in performing specific jobs. However, other parameters such as social and psychological factors of PPDs also need to be researched in order to verify their ability to engage in manual work-activities.

Out of the 92 participants, 84% were capable of performing one or more work-activities carried out by the upper extremity.

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# TEACHERS' PREPAREDNESS FOR ACTIVITY IN THE CONTEXT OF INCLUSIVE PRACTICE

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## Abstract

The arrangement of available and quality education for individuals with special educational needs is a necessary condition for such people's successful socialization in society. The development of inclusion in education is one of the priority directions of public policy in Russia nowadays. However, there are various barriers that hinder inclusive education implementation. One of such barriers is unavailability of teaching staff to work in new conditions. The authors carried out a survey of teachers to reveal difficulties they experience in the course of entering an inclusive environment. Such obstacles as teachers' insufficient competence in the sphere of psychophysiological features of individuals with special educational needs; lack of technologies aimed to train individuals with special educational needs; psychological unavailability have been revealed. Main professional difficulties that teachers meet working at all stages of training (preschool, school, and higher school) connected with emotional rejection and knowledge of peculiarities of individuals with special educational needs are described. The results of the survey testify to the fact that teachers have embraced ideas and principles of inclusive education in Russia. The obtained data prove the necessity of teachers' vocational and psychological training for an appropriate work in the conditions of inclusive education.

**Keywords:** Inclusive education, teachers, individuals with special needs, learners with special educational needs, barriers, professional difficulties

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## INTRODUCTION

Inclusive education of persons with disabilities becomes one of the main tendencies of the modern educational practice development.

In connection with the implementation of inclusive education further requests for the organization of educational activities are forthcoming. There appears a need for modification and transformation of the existing bases of professional work of a teacher. Ensuring the optimal conditions for the development and socialization of persons with disabilities becomes dominant. Therefore, the problem of teachers willingness to work in the new environment is rather sharply raised (Rieser (2013), Naraian (2013)).

The provisions and conceptual foundations of the Education Act dictate the need for teachers to master special competence, ensuring the quality of education of different categories of persons, in particular those with special educational needs. The new conditions of

teacher's work require the formation of a new professional position of the teacher allowing them to implement effectively educational programs in modern conditions (Alekhina (2013), Nigmatov (2013)).

It becomes necessary to further train the teachers with the purpose of giving them knowledge of the psychophysiological peculiarities of invalids and persons with disabilities, the specifics of reception and transmission of educational information, the use of special technical means of education, taking into account different nosology. Education personnel need to be aware of the psychological and physiological characteristics of invalid students and those with disabilities, and take them into account in the organization of the educational process (Akhmetzyanova (2014) Ilyina (2014)).

The work of a teacher in the conditions of inclusive education is diverse in content and function. Hence, there is a need for teachers to master a variety of

professional skills: gnostic, structural, communicative, organizational and special.

## **MATERIALS AND METHODS**

Given the current state of education and introduction of inclusive practice it is important to study the willingness of teachers to work in new conditions, the level of their professional competence and psychological training.

In order to determine willingness of teachers, their attitude towards inclusion, finding flaws in their training and other difficulties associated with organization of educational activities of children in inclusive education they surveyed kindergarten teachers, school teachers and university professors.

The survey involved 60 teachers, male and female, aged from 25 to 65 years, who were offered to answer anonymously in a free form the specially developed questions.

The questionnaire included 15 questions. All the questions were divided into four groups. The first group contained general information: age, gender, type of educational institutions (preschool, school, higher education).

The second group of questions was aimed at identifying the attitude of teachers to inclusive education, to persons with disabilities, to the phenomenon of disability. Teachers were offered not only to answer the questions, but also to explain their point of view: How do you feel about inclusive education? Why? Would you like to work in a group with children with disabilities? Why? Would you be able to work in a group with children with disabilities? Why?

The third group included questions aimed at finding out what qualities, knowledge and skills should a teacher, working in conditions of inclusive education have: What professional qualities should have a teacher, working in conditions of inclusive education? What, in your opinion, does a teacher need to work in an inclusive group? What technologies, methods of work, knowledge, skills, must possess a teacher of inclusive education? What competence should a teacher, working in conditions of inclusive practice form?

The fourth group of questions was aimed at identifying the professional difficulties of teachers and failings (barriers) in the organization of educational activities in the inclusive educational institutions. To do this, the following questions were asked: What disadvantages in your professional training can you identify? What are they related to? What does a modern teacher need to work effectively in the conditions of inclusive education? What needs special attention in training today's teachers to work in the conditions of inclusive education?

Thus, the survey was of complex character, as it allowed revealing various aspects of professional willingness of teachers to work in conditions of inclusive practices.

## **RESULTS**

Following the survey of teaching staff of pre-school, school and higher education the results were as follows: the majority of teachers (55%) have a positive attitude towards inclusion, considering the need for joint training of healthy children and children with disabilities in one group of educational institution. They believe that inclusive education promotes social adaptation of children with disabilities in society, the development and formation of moral qualities in healthy students and teachers interacting with people who have special educational needs. Besides, inclusion prevents discrimination on various characteristics and the division of society into classes.

30% of mentors, educators and teachers defined their attitude as neutral, explaining it by the fact that they have not formed a unified attitude towards inclusion, as inclusive education has both positive and negative aspects.

15% of teachers expressed a negative attitude towards inclusive education, explaining their response by the fact that children with developmental disabilities need to be trained in special (correctional) educational institutions with special educational environment, where teachers of a narrow specialization, focused on specific developmental disorder work. In their opinion, even the most competent general education teacher will not render that assistance to children with disabilities which they received in a special institution.

Following the study results the attitude of teachers to children with disabilities, to the phenomenon of disability showed that 45% of teachers treat children with developmental disabilities positively, with understanding, compassion and kindness. 30% of teachers find it difficult to answer this question, as a determining factor for them is a kind of disease. Teachers could accept children with visual impairment, hearing loss, disorders of musculoskeletal system or speech, but not those with intellectual disabilities and behavioral problems, as well as with some medical conditions such as HIV infection. 25% of teachers experience inner fear at the sight of children with highly visible external defects (cerebral palsy, facial pathology).

The study of the relationship of teaching staff to the educational process in the conditions of inclusion showed that 60% of teachers are not ready to implement their professional activities in the given conditions, explaining this by the lack of material-technical and methodical equipment, specific knowledge, skills, experience, practice, psychological unpreparedness. 30% of educators, teachers, and professors are willing to try themselves as a teacher of inclusive education, to enrich the educational experience, improve their professional skills, considering this trend as new and interesting. 10% of educators and teachers have neutral, somewhat passive attitude to the educational process in an inclusive group, explaining that if they have to teach children with developmental disabilities, they will not refuse.

In the analysis of the following group of responses to the questions aimed at identifying the necessary knowledge, skills, teachers' core competencies for inclusive education the following knowledge and skills have been allocated: basic knowledge of general and correctional pedagogy, general and special psychology, defectology, general, special and inclusive education, the first aid rendering; the laws of development of children in health and disease, medical diagnoses, techniques and methods of work with different children; technology of training for various groups of children; laws and legal acts.

Skills: to establish contact with others; direct attention in the learning process at any student; to adapt the training material in accordance with the

educational needs of children; combine various techniques and forms of education; distribute the learning process time; choose an individual approach to each child; interact with colleagues, parents of pupils; use the teachers' experience of colleagues; to maintain a good atmosphere in the group, equal treatment for all children, to prevent all forms of discrimination; manage their emotional state.

Experience: possession of educational material; modern technologies of teaching healthy children and those with developmental disabilities; methods and techniques of teaching healthy children and children with developmental disabilities; first aid rendering skills; skills to organize the educational process in an inclusive group; skills of work with special equipment.

Among the professional qualities important for inclusive education, teachers allocated the following: the capacity for self-development and self-improvement, love for children and for profession, endurance, perseverance, creativity, sociability and humanity.

Analysis of the fourth group of questions designed to identify some barriers in work of teachers in inclusive practice conditions, showed that 65% of educators, teachers and professors as the main difficulty singled out educational barrier associated with their lack of necessary training to work in an inclusive institution. 25% of teachers associate their professional problems with psychological barrier (psychological unwillingness to work in the conditions of inclusive practice, the microclimate in a group or a class, fear of negative peer's attitude to a disabled child). 10% of educators, teachers and professors believe that the main difficulty is material and technical barriers related to the lack of necessary special and methodological equipment in modern educational institutions.

Thus, the study of teachers' willingness to work in conditions of inclusive practice has shown that the teaching staff is not yet ready to implement the ideas and principles of inclusive education in secondary schools. Teachers have different attitudes to inclusion and some of its aspects. This allows us to talk about the ambiguity and heterogeneity of the education community attitude to the given process. Teachers

accept inclusion, children with HIA, but at the same time experience an inner fear, discomfort and difficulty in dealing with them. Teachers are willing to improve the missing knowledge and experience as well as professional skills, but worry about the lack of material and technical, as well as methodological support of educational institutions, the relationships in the children's group.

Most of the teaching staff, accepting an inclusive education system, are not psychologically prepared to work in new conditions. Therefore, in the foreground there is a problem to increase motivation, self-esteem of teachers, to overcome internal and external barriers, to relieve an emotional stress, what can be achieved in the course of psychological training, by inclusion in the practical activities of children with HIA, by better understanding of the specifics of an inclusive and special education .

## **DISCUSSIONS**

The importance of the problem of teachers' willingness to teach persons with disabilities, including an inclusive education, is noted in the works of Alekhinea S.V., Alekseeva M.N., Malofeeva N.N., Denisova O.A., Akhmetzyanova A.I. , Hitryuk V.V., Hoffman E.M., Rieser R., Pijl, S.J., Loreman, T., Armstrong, F., Ainscow, M. et al (Alekhinea & Alekseeva (2011), Malofeyev (2012) Denisova (2012), Akhmetzyanova (2014), Hitryuk (2013), Hoffman (2011), Rieser (2013), Pijl (2010), Loreman (2010), Armstrong (2003), Ainscow (2002)).

Teacher's professional willingness acquires a special role.

V.A. Slastenin considered professional willingness as a set of the interconnected and interdependent components (goal-motivational, informative-operational, emotional-determined and evaluative) to ensure success in the implementation of professionally significant functions (Slastenin (2002)). In the works of Adolf V.A., Ilyina N.F., Stepanova I.Y. willingness for pedagogical activity is treated as a unity of theoretical and practical preparedness, determining the potential of a teacher (Stepanova & Adolf (2009), Ilyina (2014)).

Analyzing the concept of "professional willingness" in the scientific literature, Koreneva E.N. and Kireev M.N. note that various authors reveal it as a systemic characteristic of the social activity of the individual, integrative indicator of his training level and professional skills. Professional willingness is viewed as an integral personal formation, characterized by a combination of external and internal motivations of individuals to implement their professional knowledge and skills in the modern socio-cultural sphere; by a high level of the acquired general professional competence, as well as by developed reflexion (Korenev & Kireev (2012)).

Hitryuk V.V. defines the concept of "inclusive willingness" (willingness to work in the conditions of inclusive education) as a complex integral subjective quality of the personality of a teacher, based on a set of academic, professional, social and personal competencies, and determining the effectiveness of vocational and educational activities. At that the academic competence is treated as the knowledge of the methodology and terminology in a particular area of knowledge, as the understanding of the operating in it systemic interrelations, the ability to use them in solving practical problems. Professional competence is understood as willingness and ability to act expediently in accordance with the requirements of the real teaching situation. The socio-personal competences imply a set of competencies related to a man himself as an individual, to the individual's interaction with other people, group and society (Hitryuk (2012)).

Thus, the problem of professional competence of a teacher, especially a teacher of inclusive education, now is relevant and attracts the interest of many scientists and researchers.

## **CONCLUSION**

Inclusive education is impossible to organize in itself. This process is associated with changes on the level of values and moral (Kirillov (2015), Nabiullina (2015)). The problems of the organization of inclusive education in modern education are linked primarily to the fact that the kindergarten, school, higher school as social institutions are focused on students, capable of moving at the pace specified by the standard program, for whom typical methods of

pedagogical work are sufficient (Gordon (2014) ). On the one hand, the "mass education with its conservative concept in the form of a relatively homogeneous in success learning groups (classes), with the motivation of studying on the basis of regulatory assessment and interpersonal comparison, creates in the reality significant difficulties to implement the idea of inclusive education" (Alekhina & Alekseeva & Agafonova, (2011), Hornby (2015)). On the other hand, the new federal state educational standards specify the requirements for the results of the students, including "willingness to listen to the interlocutor and have a dialogue; willingness to accept the possibility of existence of different points of view and the right for everyone to have his own point of view; willingness to express their opinions and argue their point of view and assessment of events" (Akhmetzyanova (2014), Sukhoterina (2013)).

The primary and the most important stage in the preparation of the education system to the implementation of the process of inclusion is the stage of psychological and value changes as well as changes of professional competence of specialists (Mukhopadhyay (2014)).

Even in the early stages of inclusive education development there sharply appears the problem of unpreparedness (professional, psychological and methodological) of teachers to work with students with special educational needs; a lack of professional competence of teachers to work in an inclusive environment is present along with psychological barriers and occupational stereotypes (Alekhina (2011) , Fayzrakhmanova (2014)).

The main psychological "barrier" is the fear of the unknown, fear of inclusion harm for the other participants in the process, negative attitude and prejudice, professional uncertainty of a teacher, unwillingness to change, psychological unwillingness to work with the "special" children (Sukhoterina (2013), Bartolo (2010)). This poses serious problems not only to the psychological education community, but also to the methodological departments, and most importantly, to the heads of educational institutions implementing the inclusive principles. Kindergarten, school and higher school teachers need specialized integrated assistance from experts in the field of

correctional pedagogy, special and educational psychology, to understand and implement approaches to the individualization of students with special educational needs, in the category that, first of all, includes children and students with disabilities. But most importantly, what the teachers have to learn is to work with children with different abilities to study and to take into account this diversity in their pedagogical approach to each.

The state of professional willingness of teachers to work in the conditions of inclusive education is determined by a combination of factors that characterize the different levels and sites of willingness and it is amplified in the case if the teacher himself is an active participant in the learning process and takes the position of the researcher. Criteria of a teacher's willingness to the inclusive teaching practice are the following:

- awareness of the need for innovation activity;
- assurance in the positive results;
- co-ordination of personal goals with innovation activity;
- willingness to overcome failures;
- technical equipment;
- positive assessment of one's own previous experience in the field of inclusive activity;
- the ability for professional reflection;
- equipment with the right knowledge and skills;
- flexibility of thought and behavior, depending on the situation;
- tendency to creativity and anticipation of the desired teaching result at the stage of choosing an influence strategy.

The structure of willingness can be represented by the following interrelated components:

- motivational component, which expresses the conscious attitude of the teacher to the necessity and conditions of inclusive education; it indicates the formed quality of the personality, which is reflected in the interest to the activity, the wish to

succeed; it shows willingness of a professional to update and ensure the necessary conditions for training in a given mode and successfully complete the task;

- cognitive component integrates and captures the knowledge of the essence of inclusive education, variants of its implementing (research, problem-searching, creative, design), educational facilities, providing organization in the studying process and in extracurricular activities (methodology and technique of teaching);
- -operational-activity component is based on the totality of the developed skills in organizing studying activities within the framework of inclusive education, holding experience activities which ensure the necessary activities in a variety of standard and non-standard situations of educational practice; value-meaningful component fixes the attitude of a teacher to the process, content and results of the professional activities, carried out in different types of teaching, reflects the personal significance of the carried out activities (Slastenin (2002), Hitryuk (2013)).

The integrating link of these components is the emotional-volitional self-regulation, understood as a person's ability to respond adequately to the situation and adjust the performance of professional activities. This is the sense of professional and social responsibility, assurance in success, enthusiasm, self-control and force mobilization, focusing on the task, overcoming fear and doubt of the unknown.

The purposeful formation of a teacher's willingness of inclusive practice creates conditions for the development of a human positive value and meaningful basis for professional activity implementation (Alquraini (2012), Akhmetzyanova (2014)).

Thus, in conditions of inclusive practice the changes must relate all components of professional willingness of teachers. These changes, along with the already existing knowledge should include:

- awareness and acceptance of the idea of inclusive education;
- acquisition of knowledge in the field of special psychology and correctional pedagogy, allowing to solve effectively professional problems in terms of educational integration.
- the data obtained can determine the priorities in teachers training, including:
  - - professional development of teachers in special psychology, correctional pedagogy and inclusive education;
  - - methodological support for teachers, including the set of scientific-methodological and organizational-methodological basis of the training organization of persons with disabilities, the design and testing of education models for persons with disabilities, the development of psycho-pedagogical educational technologies, effective in terms of inclusive practices;
  - - medical, social and psychological support of the teacher in the process of inclusive education implementation for persons with disabilities with the purpose of a comprehensive analysis of professional experience, to overcome negative emotional phenomena related to professional activity, search and implementation of the resources for personal and professional development.

In this regard, the actual education practice feels the need for professional teachers, able to work with different categories of persons in accordance with various nosologies. There is a need to develop special education of a new type - inclusive education, which enables persons with disabilities to be integrated into the education system at all the levels of education (pre-school, school, professional) and to participate fully in life.

Professional competence is a core indicator of the modern professional qualification. A competent person must not only understand the essence of the problem, but to be able to solve it in virtually any non-standard conditions.

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# DEVIANT BEHAVIOR: PSYCHOLOGICAL PREVENTION AND PSYCHOLOGICAL INTERVENTION

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## Abstract

The purpose of the study is to carry out a retrospective analysis of the basic concepts, theoretical approaches to the prevention and correction of deviant behavior that exists in modern psychology. The main method of the research is a retrospective analysis of the literature. This study shows the direction of social and psychological care for adolescents with deviant behavior which include prevention (warning, cautioning) and intervention (overcoming, correction, and rehabilitation). In conclusion, various social institutions regulate deviant behavior of an individual. Public exposure may have the character of legal sanctions, medical treatment, social support and psychological assistance. Due to the complex nature of behavioral disorders their prevention requires overcoming an organized system of social and psychological influences. Psychological prevention and intervention are seen as areas of rehabilitation, correctional and correctional-educational work with individuals who have behavioral problems, the main purpose of which is to overcome the disorders of mental development. Implementation of effective psychological prevention and correction of deviant behavior of a person occurs only when a person turns it into operation, when a person makes a personal choice, sets new goals. In order to overcome the deviant behavior, people should be able to make choices, to assess the consequences of the decisions to regulate emotional processes accompanying behavior, i.e. to organize their own livelihoods with generally accepted norms, which ultimately helps to reduce existing strains of personality as well as its active socialization.

**Keywords:** Deviant behavior, psychological prevention, psychological intervention.

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## INTRODUCTION

There are significant negative tendencies along with the positive ones in society such as changing the way people live, intensified social differentiation and conflict, increasing number of at-risk families, a growing number of adolescents and young people involved in criminal activity and drug use. The fact raising concerns is that the part of adolescents and young people, not only from at-risk families, enters the informal youth associations of an antisocial orientation. The difficult criminogenic situation encourages psychologists to seek effective ways and means of warning and overcoming deviant behavior of adolescents and youth [1, 3, 4, 5, 7, 11, 12, 9, 10].

Psychological assistance has two leading directions. They are psychological prevention

(psychoprophylaxis) and psychological intervention (overcoming, correction) [5, 11].

## Analysis of Methods and Forms of Psychological Prevention

Increasing crime and the "punishment crisis" led scientists to refer to the ideas of crime prevention. Prevention (prophylaxis) of crime and other forms of deviance is understood as influence of society, institutions of social control, individuals on criminogenic factors which results in reduction and/or desirable change of deviance structure and non-execution of potential deviant actions [ 2, 4, 7].

Three levels of prevention are distinguished in the modern world of deviance study:

- General social prevention (it is the impact on the environment, ecology, economic, social and political conditions of life of

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the population for their improvement and harmonization;

- Special prevention (i.e. providing security measures, the impact on the at-risk groups, the elimination of the circumstances that contribute to deviant manifestations;
- Individual prevention [2].

The directions of general social prevention are to improve living standards, reduce the gap between the richest and the poorest layers.

Measures of special prevention are various and include both installation of the security alarm system, on-door speakerphones, and the psychological, social assistance to at-risk groups, effective social policy.

Individual prevention involves work with concrete adolescents who are registered with the police, drug users, etc.

The concept of prevention is more democratic than repression in comparison with punishment.

Social control is one of the forms of preventive methods, which provides effort of the immediate social environment, aimed at prevention of deviant behavior, punishment of deviants, their behavior correction, motivation, values, etc. Social control is carried out by the legal authorities using coercive measures, various social institutions and organizations which are provided by organizational or economic sanctions for deviant behavior; or may be expressed in the form of public opinion and ostracism [9, 10].

Eight components forming the system of social control are defined and described in standard and psychological aspects [8] in Russian scientific literature:

- Individual actions which are shown during active interaction of an individual with the social environment.
- The reaction of the social environment to an individual's action depends on objectively existing social rating scale derived from the system of social values,

interests of social group and society in general.

- The reference of action to a specific category (which is socially approved or blamed) is the result of the functioning of the social rating scale.
- The categorization of action depends on the nature of the public consciousness, including public self-assessment and evaluation by the social group of the situations in which it operates (social perception).
- The character and the content of the social actions, carrying out the function of positive or negative social sanctions directly depends on the state of public consciousness.
- The reaction of an individual to a social action depends on the individual rating scale derived from the system of values and motivation of an individual.
- The individual's self-categorization is a result of functioning of an individual rating scale (acceptance of a role, identification with a certain category of persons).
- The self-categorization of an individual depends on a self-assessment and assessment of the situation within which an individual acts (individual perception). The nature of an individual consciousness depends directly on the subsequent individual action which is a reaction to social action.

Parson J.L. [14] analyzed three instruments of social control. In his opinion, these are isolation (used for the purpose of an excommunication of a deviant from other people, it does not even provide rehabilitation attempt), separation (means limited contacts of a deviant with other people, while he or she is not completely isolated from society that allows a deviant to get liberty early, if they are ready to follow norms of society), rehabilitation (when deviants can prepare for a return to normal life and implementation of their roles in society).

It is wrongfully to consider preventive actions only from the standpoint of social control. It is appropriate in that case when there are social deviations of penal, criminal character both in behavior of an individual and among its immediate social environment.

Thus, for example, to suspend process of criminogenic development of groups, it is necessary to pay more attention not to their destruction but reorganization that is change, restructure of their activity, the relations and communication [4].

Prevention of deviant behavior should be the correction or change of moral values. Behavioral deviations practically at any age are closely connected with a problem of family relationships. The importance of the age period will increase in creation of psycho-correctional measures because the specific of the problem often depends on the age characteristics of a client.

In this regard, S.A. Belicheva divided the negative influence which an individual gets from the immediate social environment into direct and indirect desocialization influence [2]:

*Direct desocialization influence* is an influence by the immediate environment that directly demonstrates examples of deviant behavior when there are destructive social norms and values forming deviant personality.

*Indirect desocialization influence* of the social environment is determined by social and psychological, psychological and pedagogical, social and pedagogical factors.

It is necessary not only to neutralize direct desocialization influence of the social environment, but also to create the bringing-up environment in school, family and other groups to prevent desocialization. It will allow them to become the preferred environment of communication and activity with the high reference importance in the opinion of adolescents and to perform the functions of the leading institutes of socialization.

Thus, early prevention should be considered not so much from the standpoint of social control as from the position of preventive desocialization process and management of socialization process of adolescents.

It is necessary to neutralize direct and indirect desocialization influence and to carry out corrective measures and socio-psychological rehabilitation.

### **Analysis of Methods and Forms of Psychological Intervention**

Psychological assistance is understood as providing an individual with information about his mental state, the reasons and mechanisms of emergence of psychological phenomena or psychopathological symptoms and syndromes. It is an active meaningful psychological impact on an individual for the purpose of harmonization of his mental life, adaptation to the social environment, prevention of psychopathological symptomatology and rehabilitation of an individual for the formation of frustration tolerance, stress and neurosis resistance.

We can formulate strategic objectives of psychological assistance to the adolescent personality with deviant behavior:

- the formation of constructive motivation (positive values, orientation to implementation of social demands);
- self-regulation improvement;
- an increase of stress resistance and expansion of resources of an individual;
- the development of vitally important skills;
- an elimination or reduction of non-adaptive behavior;
- an expansion of social communications and positive social experience of the personality;
- an increase of social adaptation level.

The main forms of psychological work in case of deviant behavior are the consulting, psychotherapy, socio-psychological training and organization of the bringing-up environment. A relatively new form is special departments in psychiatric hospitals for delinquent individuals with mental disorders. In these departments, the special attention is paid to the issues of socio-psychological rehabilitation of the personality. It is necessary to recognize that the most appropriate methods of social influence for the delinquent behavior are community punishment and

behavioral therapy in its various modifications [3, 5, 8, 9, 10, 11, 12].

Psychological correction in the closed institutions is focused mainly on the destruction of certain directives, representations, values, motives, stereotypes of behavior and formation of the new one to achieve self-realization of the personality in the society. Correctional work is urged to solve the conflict for both sides "personality – society", "personality – social environment", "personality – group", "personality – personality".

Thus, the leading purpose of psychological correction of deviant behavior can be defined as an achievement of positive behavioral changes [7].

Penitentiary psychotherapy (psychotherapy in the conditions of places of confinement) is an important though poorly developed form of intervention. Its specificity is defined as an extremely stressful situation for an individual, influence of asocially adjusted leaders and impossibility of the normal relations of therapeutic alliance. The conventional methods are inefficient in this case. In this regard, the specific methods adapted for the penitentiary environment [8] are used.

Psychotherapy in the closed institutions is focused on the solution of a number of tasks. First of all, it is necessary to establish the need of an individual for the psychological assistance. Further, it is important to define personal features by the techniques adapted for the penitentiary environment or specially developed scales (providing the accounting of the distorting influences of the environment).

An important task is creation of "psychotherapeutic oases", the groups or the relations protected from the effects of destructive actions. The following topical issues are the removal of psychic tension (primarily by the relaxation methods) and decrease in sensitivity to criminal, stressful influence [16]. Finally, there is a need for social training and the ability to solve problems of the convicted person in a given environment, and to get out of it. In some cases, psychological work is combined with spiritual psychotherapy. It should be emphasized that penitentiary psychotherapy faces serious and often inextricable difficulties. Therefore, the activity of priests in some cases is the only form of

psychological and social impact on the identity of the person who is serving punishment.

Efficiency of psychological influence in the case of delinquent behavior depends on the efficiency of complex of organizational (e.g. organization of an order and humane atmosphere in the institution), economic, pedagogical, medical, and social (e.g. social rehabilitation after release) measures [9, 10].

Difficult for realization but the most effective method is the creating of upbringing environment [13]. The main purpose of this approach is the removal of a person from a habitual, provocative environment that in turn should change the way of life of a person and cause personality changes.

Such forms of organization of the environment include labor groups for adolescents with deviant behavior. Life in upbringing environment is subjected to a number of rules. The basic rules are independent life support, mutual aid, strict submission to the head and elected bodies, strict observance of discipline and norms of inner life, following traditions.

Moreover, it is necessary to take into consideration information about subjective attitude of an adolescent to himself, behavior, social environment.

According to K. Rogers, subjective attitude is very important. He showed that honesty and realness of understanding deviants and their social environment are the most significant among the factors influencing the forecast of future behavior of minors-deviants (socio-psychological atmosphere in the family, the degree of influence of acquaintances, friends, physical development, heredity, etc.) [15].

Self-correction is effective in the case when adolescent with deviant behavior estimates himself and the social environment as realistic. Self-correction includes a number of links as the adoption of an individual of goal, accounting of activity conditions, operating, programming, evaluation of results and correction. The realization of these links of self-correction also assumes a certain relation to the actions, rational use of the individual opportunities which is connected with self-examination.

At the heart of self-correction of actions are various social mechanisms of demonstration and interaction of individual features [11]. One of the mechanisms is the use by a person of his favorable opportunities and strengths. Self-correction as the effect of interaction properties of various levels of personality is based on certain social conditions and requirements: general social norms, psychology and pedagogical influences, specific conditions and requirements of activity. Self-correction should be considered in unity with the correction and regulation in accordance with the objective conditions and requirements [8, 9, 10]. The rigid, excessive regulation and correction leave few opportunities for manifestation of self-control and self-correction for realization of individual opportunities.

## CONCLUSION

Thus, the leading purpose of psychological correction of deviant behavior of adolescent's personality is to achieve positive behavioral changes. At the same time, a variety of correctional methods and techniques can not diminish the role of psychologist. At all the stages of collaboration behavior of an expert remains the leading source of the reinforcement of positive changes in behavior of an adolescent, and the identity of the psychologist is the main instrument of his professional activity.

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# TREATMENT EDUCATION OF LEXICAL AND GRAMMATICAL DISORDERS'S CONSTRUCTIONS IN PATIENTS WITH LOCAL BRAIN LESIONS

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## Abstract

There is a need to form rehabilitation and correctional programmes for dyslexic people. This research aim is to study the problem of treatment of lexical and grammatical disorders' formations in a daily care hospital treatment conditions. The speech function of patients with local brain lesions was analysed using method of dominant verbal functions' evaluation (V.M. Schklovsky, T.G. Vizel). Treatment of disorders of lexical and grammatical constructions was deducted by the specially developed model of a treatment education in group and individual sessions with the use of different methods and assumptions chosen in accordance with the condition of the speech function of patients. The data analysis of the follow up speech function assessment after treatment education has revealed the significant improvement of the level of grammatical speech construction. Results of the research aimed to investigate the effectivity of the model of treatment of lexical and grammatical constructions in patients with local brain legions in a daily care hospital treatment has shown the positive dynamics of the treatment education as a result of the developed model of treatment.

**Keywords:** Aphasia, treatment education, expressive agrammatism, lexical and grammatical constructions

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## INTRODUCTION

The problem of education for treatment of aphasia draws growing attention of researchers from different fields: logopedia, neuropsychology, linguistics, psycholinguistics and others. From one side, the interest to this problem is based on the importance of her investigation for the advanced knowledge about brain functioning mechanisms, about the link between speech and brain, about its psychophysiological bases, about interrelationship between speech and other psychological processes; from the other side the growing interest to this area of knowledge is based on her social and practical importance due to the questions of full recovery of functioning of these patients [1, 2,6, 7].

In studies of many scientists and practitioners analyzing methods of treatment of the speech function of patients with local brain lesions it is noted that at certain degree expressive agrammatism is

present to all forms of aphasia. This is most prevalent in acousticomnestic and motor aphasia according to classification of aphasia of A.R.Liria [4]. There is a dysfunction of lexical and grammatical speech construction coincident with these forms of aphasia. Patients at certain degree experience difficulties of expressing their own opinions, reconstruction of the content of texts from study books. The narration of the texts is accompanied by phrase construction's difficulties. This is explained by the dysfunction of those speech operations responsible for the grammatical constructioning [3].

Aspects of treatment of lexical and grammatical site of a speech in adults with local brain lesions are researched in works of T.V. Ackhunina, T.G. Vizel, N.M. Pylaeva, L.S. Zvetkova, V.M. Shklovsky, M.K. Shohor-Trozkaya and other scientists. The main aim of the treatment education of the expressive agrammatism is overcoming of dysfunctions of grammatical structuring [1,2,4].

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One of the possible approaches to the solution of this task is presented in this article based on the example of the treatment of lexical and grammatical constructions in patients with local brain lesions going through rehabilitation in the department of the treatment therapy GAUZ «Hospital for veterans of war» of Naberezhnye Chelny city, Republic of Tatarstan, the Russian Federation.

#### **EXPERIMENTAL RESEARCH ON ASSESSMENT AND TREATMENT OF THE LEXICAL AND GRAMMATICAL CONSTRUCTIONS IN PATIENTS WITH THE LOCAL BRAIN LESIONS**

Experimental research on assessment and treatment of the lexical and grammatical constructions in patients with the local brain lesions was conducted in the department of the treatment therapy GAUZ «Hospital for veterans of war» of Naberezhnye Chelny city, Republic of Tatarstan, the Russian Federation.

Aim of research was to reveal lexical and grammatical speech disorders in patients with local brain lesions, develop a model of phrase speech treatment in this category of patients.

With this aim there were selected 30 post-stroke patients aged 30-60 years. Among them: 12 patients with residual mixed aphasia: acousticomnestic combined with the efferent motor aphasia and 18 patients with the residual motor aphasia. These patients had gone through the neuropsychological assessment (based on methodic of T.G.Vizel, V.M.Shklovsky et al., 1992) to determine neuropsychological status and topic diagnosis for each patient, given quantitative speech evaluation allowing determining the degree of speech disorders, also there was investigated the peculiarity of lexical and grammatical constructions' use with these patients.

Due to the fact that object of the research were peculiarities of the grammatical speech row construction that can be researched only on the basis of the phrasal speech requiring formation of word forms, the experimental group was formed from the number of selected earlier patients having safe phrasal level of verbal communication (moderate and light degree of speech disorders based on neuropsychological assessment and quantitative

speech evaluation). In the research participated 10 post-stroke patients aged 40-60 years with expressive agrammatism. Among them: 4 patients with residual mixed aphasia: acousticomnestic combined with the efferent motor aphasia and 6 patients with the residual motor aphasia.

Assessment was conducted based on methodics of neuropsychological research of psychic functions (T.G.Vizel, V.M.Shklovsky et al., 1992) [7].

Based on this methodic, in observed patients the level of safety of use of following skills was analyzed: case-ending, grammatical categories of subjective, grammatical categories of pronoun and time of verb, gender, prepositions. Total five tests were offered. The evaluation was made by 10-point scale.

During the assessment of the speech function of participants there were revealed difficulties in choice of lexical and grammatical expressions of thoughts as well as in its combination. The disorder of the lexical and grammatical speech construction is based on the disintegration of those speech operations, during which the grammatical structuring is made. In patients were noted mistakes in the use of lexical and grammatical constructions, presented in table №1 «Lexical and grammatical speech disorders» and on the picture 1 «Condition of grammatical speech in patients with expressive agrammatism before and after the treatment therapy».

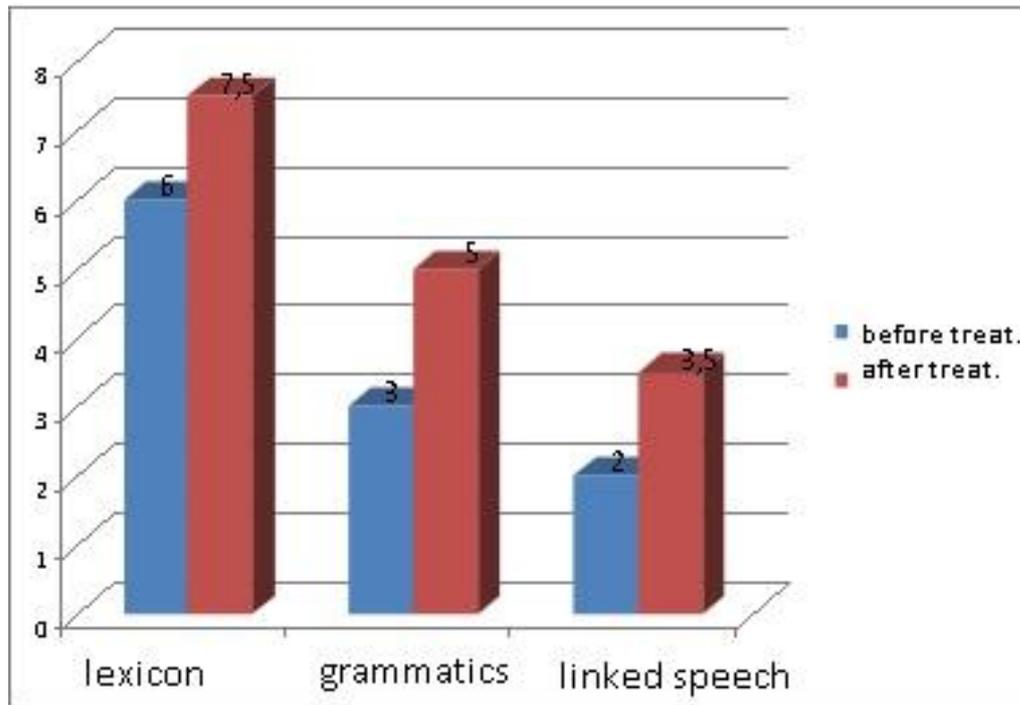
Table 1: Lexical and grammatical speech disorders

Patients (initials)	Singular and plural nouns (in relative cases)	Singular and plural verbs (present., past simple)	Sentence and case constructions	Sequence: noun with adjective, with numeral adjective, with verb (in plural)	Construction of simple sentences	Construction of complex sentences
V.N.	Mistakes in use of plural nouns of subjects	Confuses nouns of past tense verbs	Uses all prepositions with mistakes	Doesn't match subjectives with adjectives	Doesn't use the right consequence	Not available
V.D.	Difficulties aroused	Difficulties of past verbs use	Don't use right (in, from, under, above)	Subjectives with numeral adjectives and adjectives	uses	Doesn't make
Z.V.	Incorrectly uses	Incorrectly uses	Incorrectly use of prepositions	Match subjectives with adjectives with difficulties	Finds it difficult	Doesn't use in narrative
Z.U.	uses plural nouns in gender and case not correctly	Doesn't tell plural tense of verbs	Difficulties of use of all prepositions	Subjectives with adjectives, with numeral adjectives	Uses with mistakes	Has difficulties in construction of complex dependent sentences
V.S.	Has difficulties	Mistakes in use of plural tense of verbs	Doesn't know prepositions (above, under, from, between)	Subjectives with numeral adjectives and adjectives	Doesn't follow consequence	has difficulties in construction of complex sentences

M.L.	Mistakes in use of singular tense in different clauses	Difficulties aroused	Confuses simple prepositions, doesn't know complex prepositions	Don't match subjective with numeral adjective and verb	Makes up with difficulties	Doesn't use with the speech with the scenario
K.R.	Difficulties aroused	Has difficulties with use of past tense	Incorrectly uses (in, from, under, above),	Subjectives with numeral adjectives and adjectives	uses	Doesn't make
I.K.	Finds it difficult	Has mistakes in use of plural tense of verbs	doesn't know prepositions (above, under, from, between)	Subjectives with numeral adjectives and adjectives	Doesn't follow consequence of words	Has difficulties in construction of complex sentences
V.I.	uses plural nouns in gender and case not correctly	Doesn't name plural tenses of verbs	Difficulties in use of all prepositions	Subjectives with adjectives, with numeral adjectives	Uses with mistakes	Has difficulties in construction of complex dependent sentences
V.G.	Difficulties aroused	Has difficulties with use of past tense verbs	Incorrectly uses (in, from, under, above),	Subjectives with numeral adjectives and adjectives	Uses	Doesn't make

From data shown in table №1 and picture 1 it is seen that based on the relevantly variable speech there is not precise meaning and use of many general terms. In the active dictionary of patients there are prevalent subjectives and verbs. There are little words, characterising qualities, features, conditions of objects and actions. Patients make majority of mistakes e in use of simple prepositions (in, on, under, with). Also there were many violations of grammatical language forms – mistakes in sentence

cases, mixing up of time and types of verb tenses, in arrangement and management and difficulties of words construction. In active speech there are mainly used simple sentences. There are noted major difficulties, and often complete inability to distribute and make complex sentences. In all patients are noted difficulties in the replay of words of complex syllable structure. In some patients disabled temporary and logical connections in narrative: shuffle parts of the tale, miss important elements of the scenario.



Picture 1. Condition of grammatical speech in patients with expressive agrammatism before and after the treatment therapy.

In accordance with the logopedic conclusions there were developed individual rehabilitation programmes for each patient. Programs were based on the important for treatment education principle of consistency. This means, that treatment procedures must be conducted for all sites of disabled function and not only for those that were most destroyed at first.

Programs included following directions of treatment:

- reconciliation of breathing;
- afferentation in the speech cerebral regions (electrophonopedical stimulation on the apparatus «vokastim»);
- overcoming of the pronounce site of speech disorders;

- Restitution of the phrasal speech.

Overcome of the lexical and grammatical disorders' constructions was made on the basis of the specially developed model of treatment education (Pic. 2) during group and individual lessons with the use of different methods and methodics, chosen in accordance with the condition of a speech function of patients.

The reconstruction of the phrasal speech in patients with local brains legions included two directions of therapeutic work according to the model presented on Pic.2:

1. Restitution of word change of nouns, verbs, adjectives.
2. Treatment education on the level of phrase, sentence, linked speech.

Restoration of words change was initiated in two stages. During the first stage there was conducted the logopedic work on reconstruction of the skills to make afferentation of nominative plural or singular case and also, ability to coordinate nouns and verbs of present tense of singular third case. Also workout of non-sentence constructions was conducted at the first stage.

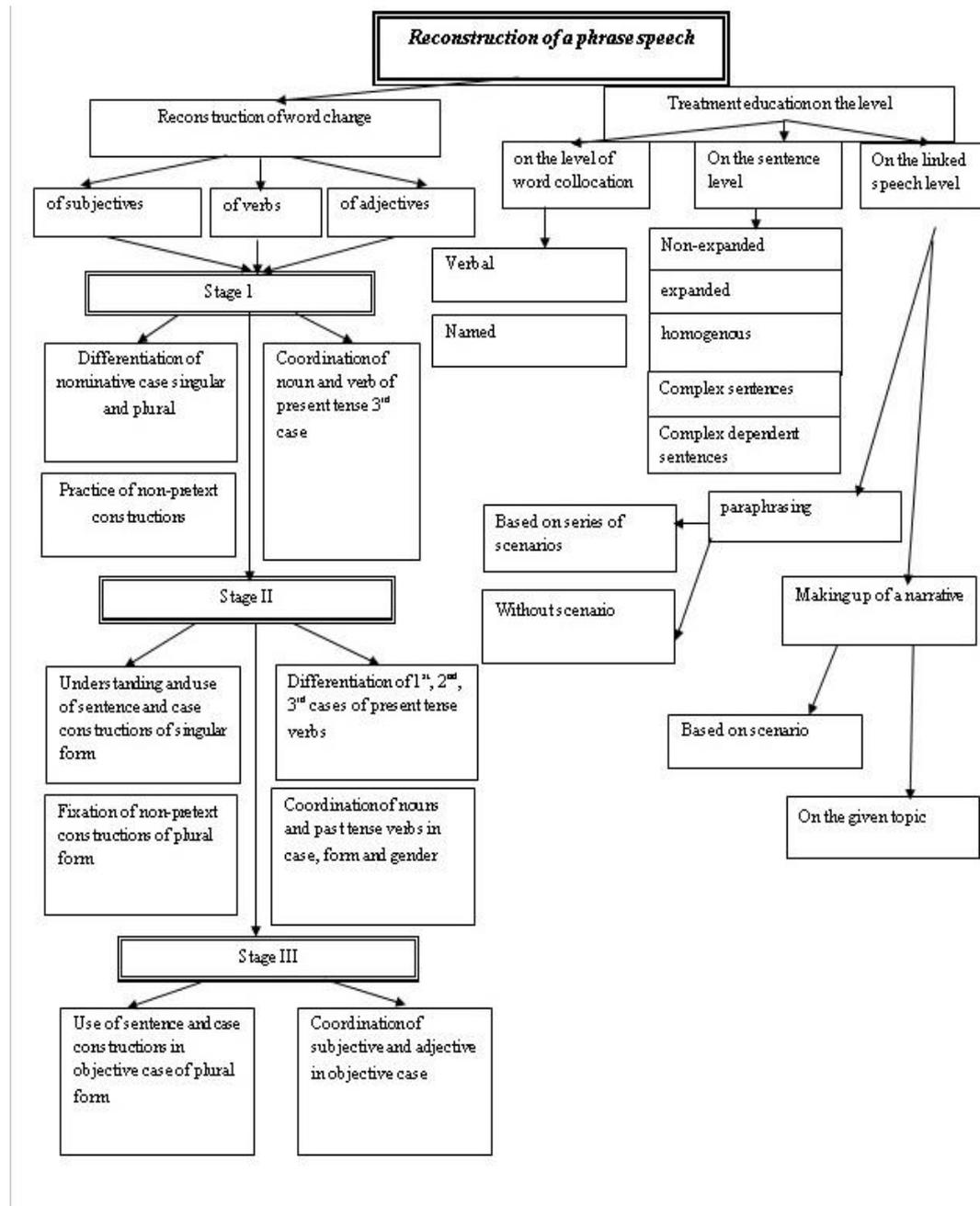
Logopedic treatment of the lexical site of speech was conducted at the first stage. Special attention was devoted to the verbal lexicon to reconstruct categories of predictive in phrase. The second stage of rehabilitation included treatment of word changing skills for nouns, verbs and adjectives. The next stage of rehabilitation was conducted at the level of phrases, sentences, linked speech.

Ontogenetic principle was in the core of the treatment of grammatical structure of speech and, in particularly, forming of the grammatical row in

ontogenesis. By this reason the word changing operation skill's reconstruction was maintained in patients firstly in phrases, then in sentences, and then in the linked speech.

Based on the methodic of R.I.Lalaeva the following types of phrases were kept in mind during rehabilitation: a) based on verbs, b) named.

The special attention in the rehabilitation of patients with expressive agrammatism was devoted to verb phrases. From one side this was based on the fact that the verb very often serves as a predicate, organising parts of the sentence and, from another side, in these patients it is prevalently predicative that fall down from the structure of sentence.



Pic.2: Model of reconstruction of a phrase speech in patients with the local brain lesions

During the treatment education aimed at maintaining forms of the word change in sentences the semantic complexity of one or another model of the sentence was brought in mind and also the consequence of the appearance of the types of sentences in ontogenesis.

During the process of word changing forms' fixation in the linked speech the consequence of the rehabilitation was determined by the complexity of the semantic structure of text, types of texts.

There were used 3 main types of text: narrative text, text-description, text-reasoning. For the treatment therapy in patients with expressive agrammatism it is mainly used narrative text and text-description. Narrative text is the simplest text for this category of patients demonstrating dynamics of events.

The visual representation was widely used for each type of the text during the initial stage.

The fixation of the word change in the linked speech was based on the self-management of linked

statements that determines the following consequence:

- paraphrasing of simple and short texts with series of scenarios with preliminary practice of the content of each scenario;
- retellings of series of scenarios without preliminary practice of the content of each scenario.
- retellings based on scenario with the preliminary practice of its content by questions;
- retellings based on scenario without preliminary discussion of its content;
- retelling without scenarios;
- making up of the tale based on series of scenarios after preliminary discussion about content of each scenario;
- making up of the tale based on scenarios without preliminary practice of its content;
- making up of the tale based on scenario with the preliminary discussion about its content;
- making up of the tale based on scenario without preliminary discussion about its content;
- making up of the tale on the give topic.

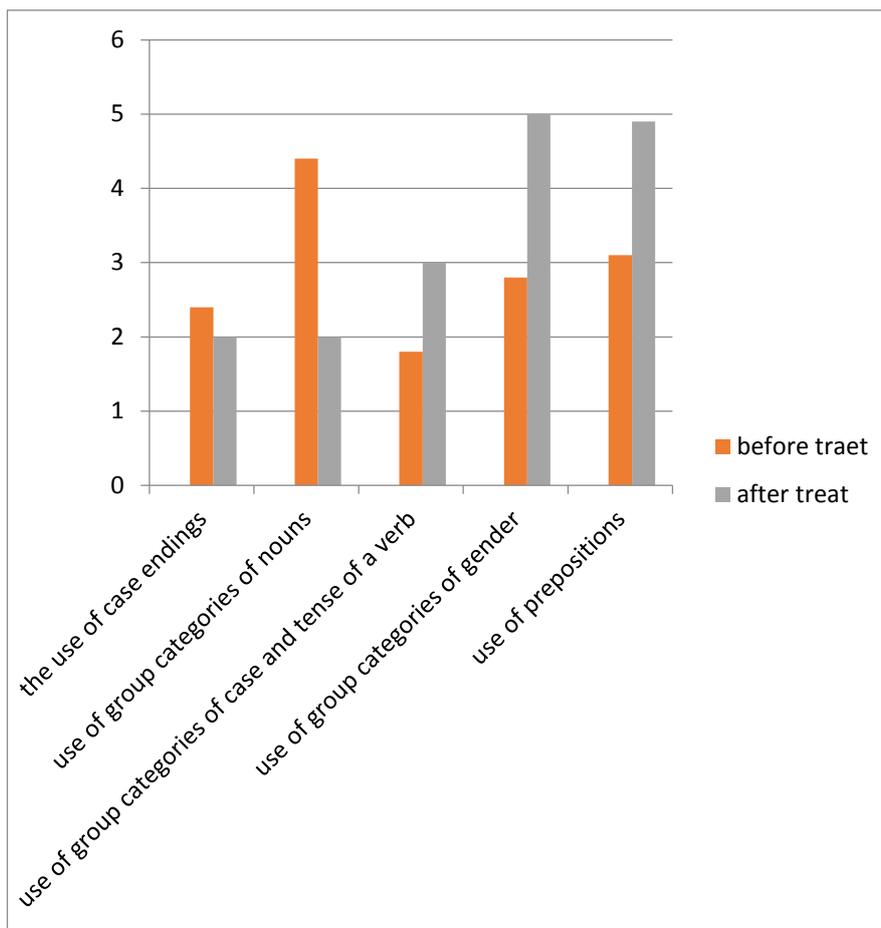
Differentiation of the grammatical form was conducted in the following consequence:

- The comparison of object, features, actions based on scenarios, selection of differences in real situations.
- Selection of the common grammatical meaning of the row of word bases in impressive speech.

- Matching up marked meanings with flexion.
- Phonemic analysis of selected flexion.
- The written labelling of flexion.
- Fixation of the link between grammatical meaning and flexion in phrases.
- Fixation of the form of word change in sentences and linked speech.

The method of visibility was used in different types: subject pictures, scenario pictures, paired pictures, schemes for making tales. Different types of games, exercises and tasks were held during treatment lessons.

To determine the effectivity of the conducted treatment education at the end of the treatment we have conducted the control testing of the lexical and grammatical row of speech for patients of the department of the treatment therapy GAUZ «Hospital for veterans of war» of Naberezhnye Chelny city, Republic of Tatarstan, the Russian Federation using methodics before treatment. In the result of the processing of statistical data of the post-treatment assessment the following results were revealed: there found an increase of the level of the grammatical row of speech. Post-treatment data are presented on Pic. 1 and Pic.3.



Picture 3. Dynamics of reconstruction of the grammatical speech in patients with the expressive agrammatism.

## RESULTS

Patients successfully learned the treatment program according to the developed by us model. In general, there was observed increased level of speech skills in patients. There was noted a tendency of increase of lexicon in the speech status of patients, appearance of homogenous terms of sentence included in the structure of the complex sentence. Many patients in the independent speech started using different grammatical constructions. However, yet patients mixed up compound linking words and tried avoiding their use in the spontaneous speech. The was improved linked speech. However, yet there were left shortcomings in the differentiation of the simple pronouns, use of compound pronouns, compound sentences. Therefore, all patients were given recommendations for continuing treatment with the speech therapist.

To conclude, we have received the positive dynamics after methodically correctly organised therapy and systematisation of the material for the reconstruction

of the lexical and grammatical constructions with the active use of the visual and didactical material.

## CONCLUSIONS

Analysis of results of the control testing of the lexical and grammatical speech row has shown that the developed by us treatment model of the reconstruction of the phase speech in patients with the local brain legions is an effective and can be used in the treatment of the speech in named category of patients.

## ACKNOWLEDGEMENT

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this research doesn't cross with research interest of other authors.

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# ENSURING RIGHTS OF WOMEN WITH DISABILITIES (WWD) IN BANGLADESH: LAWS AND CONCERNS

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## Abstract

People with disabilities are in most cases treated as subject of donations and social welfare. In Bangladesh, though approximately 15 million people suffer from various disabilities and a large portion of population of Bangladesh comprises of women with disabilities (WWD) living in an environment and society dominated by male. They are been discriminated against, socially marginalized and do not have access to basic social services. Moreover they are been victims of different crimes including domestic violence, rape or dowry which inflicts them severe loss and sufferings. Considering this situation, this article firstly aims to find out the status of WWD under human rights perspective considering major national and international instruments. Then it tries to review the ambit of legal protection of the women disabled persons in Bangladesh along with its major defaults. Lastly it recommends how the rights of WWD can fully be warranted in reference to best practices followed by other progressive states.

**Keywords:** Women with disabilities, rights, legal protection, reforms

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## INTRODUCTION

The rights of women with disabilities (WWD) are one of most ignored issues in Bangladesh. Women with disabilities are deprived of rights and privileges because of the existing social attitude towards them. Though in Bangladesh, approximately 15 million people suffer from various disabilities. (Haider 2015) but still it is regrettable that such huge population is suffering each and every day due to improper care and treatment. In Bangladesh a large number of disabled populations including women with disability have limited access to education and employment. In the families, they do not participate in the decision making process even in social gatherings (Women Watch n.d.). They have movements outside their homes with assistance from family members as and when needed. Moreover, they have limited awareness about policies and legal provisions on disability rights which makes the situation far worst. Considering this situation, this article firstly aims to find out the status of WWD under human rights paradigm considering major international instruments on

women. Then it tries to explore the ambit of legal protection of the disabled women in Bangladesh along with its failures. Lastly it recommends how the rights of

WWD can be fully realized in reference to best practices followed by other states.

The research study is basically based on primary and secondary sources. It is primarily based on a systematic literature review of the existing legal materials on disability rights in context of Bangladesh. Moreover three specific legal documents on disability rights have been selected to analyze for intensifying the issues. They are the Convention on the Rights of Person with Disability, Protection of the Rights of the Persons with Disabilities Act 2013 and the People with Disabilities (equal opportunities, protection of rights and full participation) Act, 1995. However, in order to determine the practical factors and impacts, five case studies and several numbers of semi-structured interviews of the relevant persons working and dealing with the issue are conducted as well. The selection of people who are interviewed and chosen as case-study for this study

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is done by way of purposive sampling technique. Semi-structured interviews with open-ended questions are conducted with key respondents having academic and managerial expertise on disability rights.

### **Defining Women with Disability**

The term ‘disability’ means the lack of competent physical and mental faculties; the absence of capability to perform an act. It usually signifies incapacity to exercise all the legal rights ordinarily possessed by an average person (Free Dictionary n.d.). It is an umbrella term covering impairments, activity limitations, and participation restrictions. In connection to that impairment means having problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations. Thus, disability is a complex phenomenon, reflecting an interaction between features of a person’s body and features of the society in which he or she lives (WHO, 2013). Generally person suffering from the following forms of disorders are considered as disabled: autism or autism spectrum disorders, physical disability, mental illness leading to disability, visual infirmity, speech impairment, intellectual disability, hearing infirmity, deaf-blindness, cerebral palsy, down syndrome, multiple disability, and other disabilities.

Lately in the Protection of the Rights of the Persons with Disabilities Act 2013, the term refers to any person having permanent physical, emotional, intellectual, developmental or sensual incapacity and due to what he or she cannot take part actively in the society or his/her social participation been interrupted is considered as disable person (Protection of the Rights of the Persons with Disabilities Act 2013, s 2). Moreover the Act mentioned different types of disabilities including signs and symptoms i.e. Autism, Physical, Psychosocial, Visual Impaired, Speech Disability, Intellectual Disability, Hearing Disability, Hearing-Visual Disability, Cerebral Palsy, Down Syndrome, Multiple Disabilities (Protection of the Rights of the Persons with Disabilities Act 2013, s 3).

Though it is evident that the Disability Act includes a wider ambit while defining the term ‘disability’ but there are some extents to refine it. As example ‘disability by injury’ has not included herein.

### **Rights of Women with Disability (WWD) and State Obligations under International Human Rights Instruments**

There are also various international instruments regarding protection of the rights of the disabled women, such as Convention on the Rights of Persons with Disabilities, Optional Protocol to the Convention on the Rights of Persons with Disabilities 2006 etc.

But particularly on women the Convention on the Elimination of Discrimination against Women (CEDAW), 1979 states that discrimination against women violates the principles of equality of rights and respect for human dignity which is an obstacle to the participation of women, on equal terms with men, in the political, social, economic, and cultural life (CEDAW, Preamble). The Convention is also concerned that women in poverty have the least access to food, health, education, training, and opportunities for employment and other needs. It provides a definition of discrimination against women and imposes obligation to States Parties to embody the principle of equality of men and women in their national constitutions or other appropriate legislation and to adopt appropriate legislative and other measures, including sanctions where appropriate, prohibiting all discrimination against women (CEDAW, Article-2).

Next, the International Covenant on Civil and Political Rights, 1966 specifically guarantees certain rights to women, lists a broad spectrum of rights to be applied equally to men and women, and prohibits all discrimination based on sex. The rights found in the Covenant are to be recognized without distinction of any kind, such as sex or other status (ICCPR, Article-2). The term ‘other status’ also may apply to persons with disabilities.

Further, the International Covenant on Economic, Social and Cultural Rights (ICESCR) 1966 requires member States to comply with the rights under the Covenant to be exercised without discrimination of any kind as to race, color, sex, language, religion,

political or other opinion, national or other (Article-2). It states that the Parties to ensure the equal right of men and women to the enjoyment of rights (Article-3) and equal remuneration for work of equal value (Article-7).

The Declaration on the Elimination of Violence Against Women urges to protect some groups of women, such as women belonging to minority groups, indigenous women, refugee women, migrant women, women living in rural or remote communities, destitute women, women in institutions or in detention, female children, women with disabilities, elderly women and women in situations of armed conflict, are especially vulnerable to violence (DEVAW, Preamble).

The Beijing Declaration focuses on preventing and eliminating all forms of violence against women and girls. It provides that Parties shall take efforts to ensure equal enjoyment of all human rights and fundamental freedoms for all women and girls who face multiple barriers to their empowerment and advancement because of factors such as disability (Article-32).

The Vienna Declaration and Program of Action emphasizes that human rights are universal, indivisible and independent. Paragraph 18 provides for the elimination of gender-based violence and all forms of sexual harassment and exploitation. In addition, it calls for the eradication of all forms of discrimination on grounds of sex (Paragraph 5).

Being the main instrument on disability rights the Convention on the Rights of Persons with Disabilities imposes general obligations (Article-4, CPRD) to the party states which are mentioned that States Parties undertake to ensure and promote the full realization of all human rights and fundamental freedoms for all persons with disabilities without discrimination of any kind on the basis of disability.

1. Rights of WWD and state obligation under this convention are mentioned below:
2. Equal protection and equal benefit of the law. (Article-5) and Right to full and equal enjoyment of all human

rights and fundamental freedoms by disable women and girl (Article-6).

3. Right to full enjoyment by children with disabilities of all human rights and fundamental freedoms on an equal basis (Article-7).
4. Right to access the physical environment, to transportation, to information and communication (Article-9).
5. Right to life and effective enjoyment by persons with disabilities on an equal basis with others and to get equal recognition before law (Article-10 and 12).
6. Right of protection and safety in situations of risk, including situations of armed conflict, humanitarian emergencies and the occurrence of natural disasters (Article-11).
7. Access to justice for persons with disabilities (Article-13).
8. Enjoyment of the right to liberty and security of person and right to have respect for his integrity on equal basis (Article-14 and 17).
9. Right to be protected from all forms of exploitation, violence and abuse, including their gender-based aspects (Article-16).
10. Right of movement, to freedom to choose their residence and to a nationality (Article-18).
11. Full inclusion and participation in the community (Article-19).
12. Right to freedom of expression and opinion (Article-21).
13. Right to privacy of personal, health and rehabilitation information (Article-22).
14. No discrimination in all matters relating to marriage, family, parenthood and relationships, on an equal basis (Article-23).
15. Right to education (Article-24).
16. Right to health (Article-25).
17. Right to attain and maintain independence (Article-26).
18. Right to work (Article-27).

19. Right of adequate standard of living and social security (Article-28).
20. Right of participation in political and public life, and in cultural life, recreation, leisure and sport (Article-30).

The list of rights includes rights of civil, political, social, economic and cultural in nature. Considering the convention as a benchmark now it is to examine that how the legal diagram of Bangladesh has included them in favor of disable women.

But before entering to the legal discussion, as a situational analysis of Bangladesh, certain case-studies are been discussed hereunder.

### **Case-Studies**

#### **Case 1**

Nilamoni is a disabled girl child aged of 12 years lives in a small village of Jamalpur district. Her mother had a tough time while giving her birth. Her mother was not taken to the hospital as it is the tradition of her family to give birth in the home with the help of local women. In time of Nilamoni's birth due to some complicacy, she was hurt but nobody realized that it would turn into a permanent disability. From the age of 3 it was found that she is incapable of walking and communicating with others. She was taken to medical professionals at the age of five but the doctor said that due to brain injury caused in time of birth, she is incapable to walk and hear-talk. Her parents are now helpless because there is no specialized medical facility and special school in nearby areas. Moreover due to social stigma, her movement has been restraint. Only she is getting tk.400 (USD 5) per month from the Ministry of Social Welfare as allowance.

#### **Case 2**

Ratna Begum is a woman of 20 years. She worked in a garments industry near Savar district. In 2012 an accident occurred in the factory and while rushing towards basement she was injured and lost her right leg and her job. From then she moves with her wheelchair and became burden to her family. She got a minimum amount as compensation from

the employer. She claimed that she can work like other workers if she gets back the job because she worked with hands in the swing department. But the employers rejected her saying that there is no lift in the building so she won't be able to reach to her compartment.

#### **Case 3**

Jahanara Khatun lives in Shirajganj aged of 25 year. She was the fourth girl child of the family and was unwelcomed as her father wanted a male child. She is an autistic person and from the very beginning of her childhood, she was treated as a burden of the family. She was not allowed to come before guests or to room outside the house. She got sick several times and found that she suffered from malnutrition for a long time. Sometimes she gets assaulted by her family members for causing disturbances. She suffers from diseases time to time and remains untreated. She did not get a chance to admit in school or to have any employment opportunity. That's how her life is going on with distress and humiliation.

#### **Case 4**

X (unwilling to expose name) a women of 32 years lives in a slum of Dhaka city. Her home village is in Bhola, Barisal district. She is deaf-mute from her birth but otherwise physically fit enough to continue with her life. She was born in a poverty-stricken family and had no chance to admit in school because of her disability. At the age of 19 she was raped by her cousin but nothing happened to the wrong-doer because nobody believed her. She was unable to communicate and explain the incident to the police. At the age of 22 she got married to a local small businessman who claimed dowry later on. Her husband physically assaulted her and pressurized her to bring money from her father. As she failed to do so, he divorced her. She came to Dhaka after that and now working in houses as domestic help.

#### **Case 5**

Shopna Akter is a women of 47 years. She works in a NGO in Dhaka. At the age of 31 she had a road accident and lost her legs. From then she moves with her wheelchair. Though she is a graduate and efficient in her professional work, she faces obstacle in everyday life. It is hard for her to enter

in establishments like even hospitals or to get transport. She has to change her house and re-settle near her office because it was impossible for her to live remote areas. She is working for almost 15 years but still sometimes she gets low treatment from her male colleagues. Sometimes she felt that she has been treated as a disable person which makes her unhappy. Moreover in her personal life, she is unmarried and lives with her parents. After her father's death, she got minimum share of her father's property disobeying the rules of inheritance.

Now considering the reality-check, it can be examined that why and how the legal protection is insufficient or feasible for those women. Before that some co-relating elements that negatively affecting disability rights of women are discussed herein under.

### **WWD and Co-Relating Elements Prevailing in Bangladesh**

#### ***Lack of health-care during childhood***

Lack of health care during childhood of a girl child is one the main reasons for permanent disability. Several national and international agencies conduct situational analysis of children with disabilities with a view to their organizational mandates. Studies by Sightsavers International found that 4.6 million children suffer from blindness. 29.25 percent deaf children worldwide suffer from hearing and speech problem and 19.8 percent are in the age group of 15+. According to Shishu Bikash Kendra, 27.6 percent suffer from cerebral palsy and intellectual disability is in the range of 15.1 percent (DARA, 2012). The report of UNICEF in 2010 indicates that the main causes of disability are low access to health and disability services. When appropriate health services are absent, persons' impairments lead to permanent disability.

#### ***Gender discrimination and violence against WWD***

Discrimination is often compounded for women on the grounds of gender, age and minority status. Gender related violence is a cause and consequence of disability. Gender related practices such as son preference, abandonment of the girl child, discriminatory feeding practices, child marriage, dowry are all gender related acts of violence that

lead to mental, physical and psycho social disability. Further, Rape or sexual harassments are probably the most common forms of violence against disabled women in Bangladesh. A disabled woman who is victim of violence undergoes two crises, one the violence and other the subsequent investigation and trial or legal complexity (CRP-Bangladesh, 2015). Moreover physical assault by family members or violence by intimate partner is often not considered as a crime rather a day-to-day incident. Among the women interviewed in a survey, about 84% reported ever having experienced at least one act of emotional abuse, physical, or sexual violence from their partner during their lifetime (Hasan & Muhaddes, & Selim & Rashid, 2014).

#### ***Poverty and social stigma***

It is found that more than 50% of the impairments in Bangladesh that result in people being included in current disability prevalence rates are preventable and directly associated to underdevelopment i.e., poverty. People with inadequate resources tend to have lower awareness and consideration of disability and access to basic health care services which lead to a greater risk of increasing impairment (CDD-Bangladesh, 2014). Poverty also reinforces negative attitudes towards persons with disabilities, acting as a barrier to insertion and service delivery and transforming impairments into disabilities. Moreover social stigma prevails at a high level as it is said that having a disable child is like a curse.

#### ***Less opportunities ensured and implemented***

Socio-economic opportunity provided to disable women must be ensured and monitored by the concerned authority. As we find that through laws, policies and ministerial rules some changes are been introduced but in reality those are not monitored well. As example it is found that 5% seat of transportation (Protection of the Rights of the Persons with Disabilities Act, 2013, s 32) should be kept for disable person but it is not been executed. Moreover, the law ensures active participation of disable person in development activities but in fact, it remains an unreal promise.

## Existing Legal Framework for Disabled Women in Bangladesh

The constitution of Bangladesh (Articles 10, 11, 15, 17, 19, 20, 21, 27, 28, 29, 31, 32, 36) ensures equal rights and the government of Bangladesh is bound to protect the rights and dignity of all citizens equally and without any discrimination. In connection to that in 2001 the Disability Welfare Act (Act no. 12) was passed. Later in 2007, Bangladesh ratified UN convention on the rights of persons with disability (UNCPRD) (Wikipedia, 2014). Considering it, state parties are under obligation to incorporate affirmative actions in their disability policies so that through some positive interventions equal participation and opportunity can be ensured (Faruque, 2012). In 2013 Protection of the Rights of the Persons with Disabilities Act has been passed and enforced.

This Act has been passed with a view to ensuring the rights and dignity of persons with disabilities. The newly enacted law will abolish the former “Bangladesh Persons with Disability Welfare Act, 2001.” The aim of the act is to guarantee the educational, physical and mental improvement of disabled persons and to support their participation in social and state activities by removing all sorts of discrimination. Lastly in 2015 the Rights and Protection of Persons with Disability Rules has been notified in November.

### Aspects of the Act Along with Major Loopholes

The law stipulated certain rights for the disabled persons (Section-16). According to the newly enacted law, another 19-member national executive committee (Section-17) headed by the social welfare secretary, will work for national implementation of the law, and ensures some the following rights:

- To survive and grow in full with legal recognition in every sphere of life, and access to justice
- Right to inheritance, Freedom of expression and opinion, and access to information
- To live in a society with parents, legitimate or legal guardian and

children, and to have marital relations and to form families

- To attend every level of education and educational institutions – either special or integrated
- To get a safe and healthy environment and protection from persecution
- Subject to availability, the highest quality of health services
- To have congenial environment for the convenience and reasonable accommodation in all areas including education and work
- To get appropriate service and rehabilitation to attain physical, mental and technical capacity in order to fully integrate in all aspects of the society
- To obtain safe housing and rehabilitation, as far as possible, for individuals with disabilities who are dependent on the parents and subsequently isolated from parents
- To participate in culture, entertainment, tourism, leisure and sporting activities
- According to the desire of hearing-impaired and speech-impaired persons, Bengali sign language to be accepted as the first language
- To receive national identity cards, inclusion in the list of voters, to give vote and to participate in elections and any other rights prescribed by the government by notification in the official gazette

It has been appreciated by all that the act acknowledges certain rights of PWD whereas the previous act only dealt with provisions under the title of “welfare”. So the shift from ‘welfare’ to ‘rights and protection’ itself admits the truth of existence and justification of disability rights. Though it is considered as a right-based law still there are some ambiguities or insufficiencies need to be addressed. From the document analysis, case-studies and semi-structured interviews the major loopholes are found been mentioned below.

### ***Process of Identification***

In the act it is said that for the purpose of identification and registration the disable person himself or any other person from his behalf must apply (Protection of the Rights of the Persons with Disabilities Act, 2013, s.31) which does not comply with the socio-economic situation of Bangladesh. As it is observed that in India that the state government takes the responsibility to identify by screening all children at least once in a year to identify “at -risk” cases. [People with Disabilities (equal opportunities, protection of rights and full participation) Act, 1995, s.25] So early detection of disabilities should insert in the act which to be done by medical board and ‘disability certificate’ should be issued (at the time of birth and early stages of childhood) for future legal privileges. When interviewed on 10<sup>th</sup> December 2015 Mr. Talukder Rifat Pasha, Assistant Project officer, Work for a Better Bangladesh (WBB Trust), he also alleged that after examining some other provisions it seems that there is a tendency in the act to confer liabilities to the families or organizations of the disabled persons rather taking responsibilities on the shoulder of the concerned authority.

### ***Absence of Comprehensive Education Scheme***

Referring to education, in section 33 it is only mentioned that no discrimination will be spared in admission in educational institutions but no specific provision is found referring free education in normal school upon 18 years or likewise. Moreover conducting special part-time classes, providing free of cost special books and equipments, providing educational institutions teaching aid, special teaching materials are not been incorporated. When interviewed on 10<sup>th</sup> December 2015 Mr. Atiqur Rahman, Project officer, Work for a Better Bangladesh (WBB Trust), he added that no provision is found on comprehensive education scheme for disable a woman which is a major loophole of the Act. It may be said in defense that the ministry of social welfare is conducting projects and programs for such purpose but it is undoubted that a disabled-friendly state must provide full outline to execute disability rights in their legislations to give it a legal mandate.

### ***Addressing Employment Rights***

To add another point, employment opportunity in the Act got place ensuring non-discrimination on the ground of disability but no specific and special schemes are found. In India the act ensures the responsibility of the government to identify posts that can be reserved for PWD. [People with Disabilities (equal opportunities, protection of rights and full participation) Act, 1995, s.29] It tries to ensure appointment of 3% of vacancies to be filled by them. Further, special employment exchange programs are been introduced to enhance such opportunities. When interviewed on 4<sup>th</sup> January 2016 Ms.Sabrina Sultana, President and Founder, Bangladesh Society for the Change and Advocacy Nexus (B-SCAN) explained the importance of inserting those provisions along with strategies like access to small credit or negotiation with employers to include disable women in industries for their economic independence. She also added that according to the Labor law of Bangladesh provisions are there to provide compensation for injury caused to employee in course of employment which is insufficient. But it would be better if the employer keeps the labor in the employment and sifts her to any other division of work she is capable of doing.

No provision of participation of WWD as representative

Certain committee’s i.e. national co-ordination committees, city committees have been formed under the Act which are responsible to ensure disability rights but it is major mistake that no position for a representative from disabled women is found. It is a general principle of public law that in case of enforcement of rights, representatives must be appointed who can take part in the legal process. When interviewed on 12<sup>th</sup> January 2016 Dr.Shah Alam, Member, Bangladesh Law Commission he also mentioned that this provision should be amended and reformed to ensure participation of WWD in the concerned committees.

### ***Insertion of Less Affirmative Actions***

In the act, a few affirmative actions are mentioned whereas there should be a list of such act ions. As

example, for the preferential allotment of land to establish houses, special schools, special recreational centers, research centers or factories are essential for each defined territory. When interviewed on 9<sup>th</sup> January 2016 Mr. Iftekhar Mahmud, Vice President, Society for Unique Capable Citizens (SUCC) has also confirmed that without logistic support and access to those support, it would be hard for disable person including women to flourish.

#### ***Absence of Emergency Safety Provisions***

Most importantly assessments of risk situation and humanitarian emergencies have been absent which is surely a major gap. All necessary measures to ensure the protection and safety of persons with disabilities in situations of risk, including situations of armed conflict, humanitarian emergencies and the occurrence of natural disasters not addressed by the Act.

#### ***No Special Attention to Law Reforms for Disable Women***

The Act does not protect WWD from all forms of exploitation, violence and abuse, including their gender-based aspect which is another imperative under the Convention (Article-16). Provisions protecting the rights of women with disabilities must be included in the Dowry Prohibition Act 1980, Domestic Violence Act, Family Court Ordinance 1984, draft Victim Witness Protections Laws and other pending law reform initiatives. When interviewed on 12<sup>th</sup> January 2016 Dr. Shah Alam, Member, Bangladesh Law Commission mentioned that the new witness protection protocol will be beneficial in the case of witnesses for blind (and hearing impaired) victims of rape, abuse and violence. It is obviously a good sign of change. Moreover in cases of violence, exploitation and torture on disabled women, legal provisions related to summons of persons, trial in absentia, adjournment and appeals (Sections in Chapter VI, Section 339 B, Section 344 and Sections contained in the Code of Criminal Procedure (Cr.P.C.) should be strictly complied with (BLAST, 2014).

#### ***No directory provisions for making future laws and policies relating to women***

There are certain government policies regulated by Ministry of women and children along with

ministry of social welfare. In the Act, it was expected that some directory provisions will be there that can be used as guidelines while making relevant laws. As example in courts, no sign language is used which should be, so while making any change relating to court proceedings the convenience of WWD should be in consideration.

It is noteworthy that those shortcomings are affecting the enforcement of disability rights of PWD because it is not only the aim of a law to recognize substantive rights but to provide full process of effective execution and implementation. Moreover considering the three basic doctrines of disability rights (empowerment, participation and legal protection) it is found that the act has been admitted those but in a limited capacity which needs further reform.

#### **CONCLUSION ALONG WITH RECOMMENDATIONS**

WWD are the most vulnerable and disadvantage segment of the society and they have faced and continue to struggle against many social and economic disadvantage (The Danish Bilharziasis Laboratory, 2004). In Bangladesh, WWD face hardships and sufferings due to lack of proper declaration of their special requirements within a proper legal framework. In such background the paper has tried to discuss on the legal propositions relating to disability rights. The objective of the paper was to find out the legal lacunas of disability laws of Bangladesh with comparing international legal instruments and laws of progressive states.

With the above discussions I draw conclusion with recommendations as follows:-

- Necessary amendments should be done in the Act, 2013 and to insert most essential provisions for WWD like emergency safety provision and detail list of affirmative actions.
- Identify and modify contradictory laws and policies necessary to protect rights of WWD and to prevent violence against them.
- Participation of WWD or representatives of them must be ensured in the

committees because they deserve positions to ensure their special treatment.

- Insertion of provision that can direct law-makers while enacting disable women friendly public and private laws must be inserted in the Act.
- Judicious mind should be expanded particularly by courts in terms of ensuring substantive and procedural equality. Moreover, in the justice sector disability issues should be incorporated in the training module for the police, court and prison officials and in the Bar Council's 'Canons of Professional Conduct and Etiquette' for practicing lawyers.

So, disability laws should be improved to include women with disabilities within mainstream development efforts by ensuring their needs. Strategies must emphasize on the importance of simultaneously removing other barriers to inclusion such as negative misperceptions of disability, lack of physical convenience, difficulties in communicating and the low level of skill, self-reliance and leadership competence of women with disabilities themselves.

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# A PROFILE OF CHILDREN WITH CEREBRAL PALSY: IDENTIFYING UNMET NEEDS IN HEALTH AND SOCIAL CARE

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## Abstract

Provision of care to a child with Cerebral Palsy (CP) requires individualized assessment and management of all associated problems. They need special education and their families need social support to face day-to-day demands of caregiving. We reviewed the characteristics of 375 children with CP attending Teaching Hospital, Karapitiya to identify their health problems and current level of health and social care utilization. Data were collected through questionnaire-based interviews with caregivers or extracted from child's medical records. The results revealed that approximately 2/3<sup>rd</sup> of the children had spastic quadriplegic CP and 54% had some co-morbidity. The majority (30.9%) had 3-4 functional problems. Problems with mobility (77.6%), social activities of daily living (69.3%), bladder/bowel function (70.4%) and speech (57.9%) were the common functional problems. Learning difficulties were reported in 29.3%. Nearly 17% had behavioural and emotional problems. Approximately 98% of the children received physiotherapy. Despite higher numbers having problems with speech and activities of daily living, only 48% received speech therapy and less than 10% received occupational therapy. Among pre-school and school age children, over 70% had never attended school. Only 17.2% of school attendees received special education. Although nearly 70% was from rural, low socio-economic backgrounds, only 12.8% received any form of external financial support. We conclude that children with CP and their families have many unmet needs in the areas of therapy, special education and social support. These needs should be addressed adequately in developing long-term care plans for children with CP, in order to achieve better outcomes.

**Keywords:** Cerebral palsy, unmet needs, health, special education, social support

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## INTRODUCTION

Cerebral palsy is a permanent disorder of movement and posture and the commonest cause of physical disability in children in many countries (Kriggler 2006, Werner 2006, Rosenbaum 2009). It is caused by non-progressive disturbances to one or more specific areas of the brain, usually occurring during fetal development; before, during, or shortly after birth; or during infancy.

The incidence of cerebral palsy among term infants is about 1.8 per 1000 live births (Rosen and Dickinson 1992). Increased survival of extremely preterm infants has led to a change in the clinical picture of the disease. However, the global incidence of cerebral

palsy has remained constant over the years, around 2.5 per 1000 live births (Missiuna *et al*, 2001, Kriggler 2006) and the incidence is supposed to be higher in developing countries (WHO 2005).

Cerebral palsy is characterized by an inability to fully control motor function, particularly voluntary control of muscles and coordination (Shanker and Mundkar, 2006, Kriggler 2006). Depending on which areas of the brain are affected, the affected children may show muscle tightness or spasticity, involuntary movement, disturbance in gait or mobility, difficulty in swallowing and problems with speech. Also these children can have abnormal sensation and perception, impairment of sight, hearing or speech, seizures,

and/or mental retardation. Other problems, such as difficulties in feeding, poor bladder and bowel control, problems with breathing due to postural difficulties, pressure sores, and learning disabilities may arise in some occasions.

Management of cerebral palsy aims at helping the child achieve maximum potential in growth and development. This should be started as early as possible with identification of the very young child who may have a developmental brain disorder. A multidisciplinary team consisting of paediatricians, physiotherapists, occupational therapists, speech therapists, educators, nurses, social workers, and other professionals can assist the child as well as the family. As these children grow up, they may require support services such as educational and vocational training, independent living services, counseling, transportation, recreation/leisure programmes, and employment opportunities, all essential to the developing into adulthood.

However, not all children with cerebral palsy have equal access to these health and social services. Utilization of health services by children with special health care needs could be far less than ideal, especially in resource poor settings (van Dyke *et al*, 2004, Szilagyi *et al*, 2004, Parish *et al*, 2012). Although children with special needs should receive special focus in health and social care and policy planning, data pertaining to such children and their care needs are scarce in Sri Lanka, both at the national and regional levels. Significant gaps exist in evidence relating to the status and services for people with disabilities, barriers to education and access to healthcare (Peiris-John *et al*, 2013).

While the functional capability of a child with cerebral palsy depends on his/her developmental stage, the actual performance of the child will relate to contextual factors like the role of parents, family and availability of resources (e.g. rehabilitation equipment). These children and their caregivers must therefore be empowered to face the mounting challenges of inclusive living to guarantee equal opportunities for them. Identifying the unmet needs in the areas of health, education and social care for these children is essential for planning and organizing the much needed services. This in turn will enhance the health and quality of life of the children themselves as well as their families. This study aimed to review the characteristics of children with cerebral palsy

attending a tertiary care hospital, with a view to evaluate current level of health and social care received by them.

## **MATERIALS AND METHODS**

This study was conducted using secondary data from a database of 375 children with cerebral palsy and their caregivers attending Teaching Hospital, Karapitiya (THK), Galle, Sri Lanka. THK is the only tertiary care institution in the whole of the Southern province which possesses a network of facilities necessary for multi-disciplinary management of children with cerebral palsy.

The database was created for a study on caregiver burden in cerebral palsy. Study participants were children aged between 1 to 12 years with a confirmed diagnosis of cerebral palsy and their principal caregivers, who were permanent residents of Galle district. The children receiving services from paediatric wards, outpatient paediatric clinics, Rheumatology and Rehabilitation Unit (RRU) and Speech and Language Therapy Unit (SLTU) of the THK were included in the sample. The original database included information collected through questionnaire based interviews with the caregivers or extracted from the child's medical records. Relevant socio-demographic, disease related and services related data were extracted and analyzed in this study. The initial data collection and data extraction were done by trained pre-intern medical officers. Ethical approval for the study was obtained from the Ethical Review Committee of the Faculty of Medicine, University of Ruhuna, Sri Lanka.

The socio-demographic variables included the age and gender of the child; age, ethnicity, residential area, educational status, employment status, income and social class of the caregiver. Social class was categorized according to the classification given by Barker and Hall (1991) based on father's occupation (or mother's occupation if father is unemployed or had a lesser occupational status than the mother). The professionals, semi-professional and non-manual workers were classified as upper social classes, where as skilled and unskilled manual workers or unemployed were considered as lower social classes.

The functional status of the child was assessed by a Consultant Paediatrician based on the information available in the medical records of the child. The data

analysis was done using SPSS (version 18.0) statistical software package.

## RESULTS

The study included 375 caregiver child pairs. The mean age of the children in the sample was 3.2 ( $\pm 2.7$ ) years and there was a slight male preponderance (51.2%).

Ninety seven percent of the principal caregivers were the mothers and nearly 2% were grandmothers.

Fathers contributed as principal caregivers in approximately 1% of the children. Age of the caregivers ranged from 18-65 years and the mean age was 32.4 ( $\pm 7.2$ ) years. Over 70% were from rural, low socio-economic backgrounds. Majority of the caregivers (75%) were currently unemployed and 20% have given up their jobs to look after the child. The basic socio-demographic profile of the children and their caregivers is shown in Table 1.

Table 1: Characteristics of the sample of children with cerebral palsy and their caregivers (N=375)

Characteristic	Number (%)	
Age of the child	Less than 5 years	303 (80.8)
	5 – 8 years	44 (11.7)
	Over 8 years	28 (7.5)
Sex	Male	192 (51.2)
	Female	183 (48.8)
Caregiver age	Less than 30 years	147 (39.2)
	30 – 49 years	222 (59.2)
	50 years or above	6 (1.6)
Residential area	Urban	104 (27.7)
	Rural or estate	271(72.3)
Ethnicity	Sinhala	347 (92.6)
	Other	28 (7.4)
Caregiver educational status	Primary education or below	62 (16.5)
	Post-primary education	224 (59.7)
	Secondary education or above	89 (23.8)
Caregiver employment status	Employed	25 (6.7)
	Not employed	350 (93.3)
Monthly family income	Rs. 10,000 or less	263 (70.1)
	Above Rs. 10, 000	112 (29.9)
Social class	Upper social classes	100 (26.7)
	Lower social classes	275 (73.3)

Approximately 2/3<sup>rd</sup> of the children had spastic quadriplegic cerebral palsy and 54% had some co-morbidity such as epilepsy or heart diseases. Majority of the children (30.9%) had 3-4 functional problems.

The limitation of motor functions was the commonest functional problem (77.6%) in this

sample. Problems with bladder/bowel function (70.4%) and impaired social activities of daily living (69.3%) were also prevalent (Table 2).

Table 2: Type of cerebral palsy and the functional problems among the children (N=375)

Variable		Number (%)
Type of Cerebral palsy	Spastic Quadriplegic	250 (66.7)
	Spastic Hemiplegic	32 (8.5)
	Spastic Diplegic	27 (7.2)
	Athetoid cerebral palsy	2 (0.5)
	Unclassified	64 (17.1)
Functional problems	Seizures	191 (50.9)
	Visual problems	98 (26.1)
	Hearing problems	72 (19.2)
	Speech problems	217 (57.9)
	Learning difficulties	110 (29.3)
	Problems of emotion & behaviour	65 (17.3)
	Problems of mobility	291 (77.6)
	Problems of social activities of daily living	260 (69.3)
Problems of bladder and bowel function	264 (70.4)	

Table 3 shows the use of health, education and social care services by the children with cerebral palsy in this sample.

**Utilization of health services:** The vast majority of children in the sample used some form of therapy service. Approximately 98% of the children received physiotherapy. Despite the higher prevalence of speech problems (approximately 58%), only 48% received speech therapy. Although over 70% had problems with mobility and activities of daily living, only fewer than 10% received occupational therapy.

**Status of schooling:** Among pre-school and school age children (N=164), over 70% had never attended school and only 29 (17.7%) were receiving a formal education. None of the children attended a special school designed for children with special needs. Among those attending schools (N=29), only 17.2% received special education.

**Availability of social support and special facilities:**

Regarding Social care and assistance, the majority of the children with cerebral palsy in this sample (86.4%) did not have any special facilities at home. The only available special facilities included special equipments such as special seating and mobility aids.

**DISCUSSION**

In this study sample, many deficits in the use of specific therapy were observed, indicating the unmet needs in these areas. Similarly, the use of educational and social services was far from optimal, probably as a result of unavailability and difficulties in access. Lack of awareness and direction could be a contributory factor for poor utilization of available health care in some instances. While many were attending this tertiary care institution for physiotherapy, the speech and occupational therapy services in the same facility were not utilized by them (Table 3).

Table 3 Utilization of health and social care services by the children with cerebral palsy

Type of service	Number (%)	
Therapy services (N=375)*	Drug therapy	200 (53.3)
	Physiotherapy	367 (97.9)
	Speech therapy	181 (48.3)
	Occupational therapy	37 (9.9)

Use of educational services (N=164)	Currently attending school	29 (17.7)
	Currently not attending school	19 (11.6)
	Never attended school	116 (70.7)
Type of school (N=29)	Special school	0 (0.0)
	General school/special class	5 (17.2)
	General school/general class	14 (48.3)
	Preschool	10 (34.5)
Receipt of financial support (N=375)	None	327 (87.2)
	From Government	37 (9.9)
	From non-governmental organizations	11 (2.9)

\*Percentages do not add up to 100 due to multiple responses\*

Children with special needs have a greater demand for health care than those without special needs (Szilagyi 2004, Newacheck and Kim, 2005), resulting in increased health care costs. From our results it was evident that over 70% of the children with cerebral palsy belonged to economically deprived families and a considerable proportion (20%) of caregivers had given up their jobs to look after the child (Table 1). Moreover, the majority lived in rural areas, and the services of therapists are virtually limited to major hospitals in urban settings, compelling them to travel over long distances. The interplay of these conditions can create a vast economic burden. Van Dyke (2004) reported similar conditions among children with disabilities in the United States. Although unmet health care needs were observed in a minority compared to our study sample, the proportion with economic hardships was substantial, partly as a result of their caregivers cutting back or quitting work. Provision of financial assistance through government or non-governmental sources would be a crucial factor to ensure an acceptable level of health care for these children. The need of financial assistance for families of children with special health care needs has been highlighted by other studies also (Bertule and Vetra, 2014).

Children with disabilities are more likely to have low school enrolment and high dropout rates (UNICEF, 2012). Even with a high national primary school enrolment rate at 92%, many children with disabilities in Sri Lanka have not started schooling according to the Ministry of Social Welfare (2003). Similarly, the Ministry is concerned that the attrition rates of children who have disability are high. Both these concerns are reflected in our findings where

only a minority of children (less than 30%) had ever attended school and a substantial dropout rate of 11.6% was observed (Table 3).

The majority of the children who were attending schools or preschools in this sample were enrolled in general classes of mainstream schools along with the other typically developing children (Table 3). Although this could be viewed as a positive step towards inclusive education, the extreme competitiveness and the tight work schedules prevailing in the classroom settings in Sri Lankan schools may place them at a disadvantage.

Provision of care for a child with a disability is a challenging experience for the caregivers (Raina *et al*, 2005, Brehaut *et al*, 2009). The role of social support is identified as an important factor in preventing negative consequences of caregiving (Ha *et al*, 2011). Apart from the minority (12.8%) who received some financial assistance from the Department of Social Services and a few non-governmental organizations, the families of children with cerebral palsy in this sample have not received any other form of external social support (Table 3). Considering that over 70% of the sample is socio-economically deprived, our findings reflect an enormous gap between the needs and services. In addition, the financially stable families could also benefit from other forms of social support such as counseling and respite care. Such services are yet an unavailable luxury for the caregivers of the disabled in Sri Lanka.

This study is the first attempt at identifying the health and social care needs of an important group of children with disabilities in a low resource setting. Its

major strength is the use of data from a larger sample. However, our findings are limited by the fact that the children and caregivers studied are those already accessing the health services. Therefore, the prevalence of health care utilization could be an overestimation of the actual usage observed in a community based survey. Since it is evident from the results that the receipt of care is not optimal even among the users, we can safely assume that the unmet needs are even greater among those whom we failed to capture in this study. Secondly, the sample was derived from those attending a government health care facility which offers free health services and normally caters to low and middle income categories. This can lead to an under-representation of economically stable families in the sample, which could partially explain the greater numbers of participants being among disadvantaged groups. A third limitation is the use of secondary data, limiting the comprehensiveness of the survey. For example, we were unable to assess the need for certain aspects of care such as dental services or nutritional care. Lack of recorded data on such aspects among the current assessment of children itself is a clear indication that these areas are not adequately addressed during the routine care provision and suggests the possibility of further unmet needs. Further research is needed to evaluate the specific health and social care needs in these children and the extent to which these needs are met by their care plans.

## **CONCLUSIONS**

This study revealed that there are many unmet health and social care needs among children with cerebral palsy, especially in the areas of specific therapy (speech therapy/occupational therapy), education and social support. Early identification of disabilities and formulation of long term care plans involving multidisciplinary management is a priority in provision of care for these children, in order to achieve better outcomes.

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# IN DEPTH STUDY OF EPIDEMIOLOGY IN TRAUMATIC SPINAL CORD INJURY PATIENTS PRESENTED TO THE MAIN SPINAL REHABILITATION UNIT IN SRI LANKA

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## Abstract

Spinal cord injury (SCI) has high mortality and morbidity. Prevention is the best way to reduce the burden on health sector and society. Lack of a large scale referral study on epidemiology of SCI in Sri Lanka, is a barrier to improve methods of prevention. A descriptive (prospective) study was conducted in Rheumatology and Rehabilitation Hospital, Ragama, where randomly selected 42 patients diagnosed of traumatic spinal injuries were presented with an interviewer-administered questionnaire after consent. Mean age of the study population was 32.74 years (SD 11.94), where 86.36% of them were males. 61.9% were married. 85.7% were occupied, out of which the majority had engaged in elementary occupations (33.34%). Only 28.6% had secondary or higher education. Most of the injuries (44.4%) were due to falls occurred during occupational activities. Other significant etiologies contributed include falls during recreational / house hold activities and road traffic accidents with 22.7% and 22.2% respectively. Interestingly 78.94% of the injuries occurred during weekdays while 47.37% of the injuries took place during routine working hours (8.00 am to 4.00 pm). The majority had thoracic spinal injuries (55.56%), while 33.2% and 11.2% had cervical and lumbosacral injuries respectively. 52.4% had severe presentation with complete ASIA (American Spinal Injury Association) level "A" injuries. The final analysis indicates that traumatic SCI are more common among young males with low level of education, who engaged in elementary occupations. Hence these populations should be mainly targeted when planning methods of SCI prevention in Sri Lanka.

**Keywords:** Spinal, injury, epidemiology

## INTRODUCTION

Spinal cord injury (SCI) is an insult to the spinal cord resulting in a change, either temporary or permanent, in the cord's normal motor, sensory, or autonomic function. Patients with spinal cord injuries usually have permanent and often devastating neurological deficits and disability. It was labeled as "an ailment not to be treated" in the Edwin Smith papyrus 5000 years ago. Unfortunately not much has changed, in many parts of the world known as the underdeveloped countries.

The incidence and prevalence of spinal injuries have been increasing, with the incidence rate estimated at

15 to 40 cases per million worldwide, although injury prevention initiatives have tried to reduce the occurrence of SCIs (1). Spinal cord injuries can be divided into traumatic and non-traumatic injuries. The four main causes of injury were traumatic injuries, including traffic accidents, being struck by falling objects, crushing injuries and high falls, followed by low falls, violence, non-traumatic causes, sports-related injuries, and other unknown causes (2).

Spinal cord injuries are highly disabling and concentrated in young adults. As shown by the data of other studies, SCIs had affected with a male to female ratio of 2.5:1 and the average age at injury was 35.5+/-15.1 years (35.4+/-14.8 for males and

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35.9+/-16.0 for females), which cause substantial burden for the affected individuals, their families and society. (3). But unfortunately in Sri Lanka there are no large scale studies regarding epidemiology of spinal cord injuries so far.

## **METHODS**

The study was designed as a prospective descriptive study which was conducted at the Rheumatology and Rehabilitation Hospital (RRH) Ragama, which has 270 beds dedicated to Rheumatology and Rehabilitation, of which 125 beds are exclusive for spinal cord injury patients.

Patients with traumatic spinal injuries who admitted to RRH during this study period were included & the patients with non traumatic spinal injuries were excluded. All the patients satisfying the inclusion criteria were recruited and data collection was proceed until the minimum sample size was achieved.

Interviewer administered questionnaire and a data extraction tool was used after pretesting. Face validity and consensual validity were assured beforehand. The investigators collected data by themselves from the patients or guardians.

## **RESULTS**

Mean age of the study population was 32.74 years (SD 11.94), where 86.36% of them were males. 61.9% were married. 85.7% were occupied, out of which the majority had engaged in elementary occupations (33.34%). SCI were more common among people with low level of education as only 28.6% had secondary or higher education level. The majority (76.19%) were referred to us from the National Hospital of Sri Lanka.

Most of the injuries (44.4%) were due to falls occurred during occupational activities. Other significant etiologies contributed include falls during recreational / house hold activities and road traffic accidents with occurrences of 22.7% and 22.2% respectively. Interestingly 78.94% of the injuries occurred during weekdays, while 47.37% of the injuries took place during routine working hours, which was defined as from 8.00 am to 4.00 pm.

In 94.4% SCI were due to blunt injuries while remaining had penetrating trauma. 95.24% had vertebral injuries and 28.57% had associated other injuries when admitting to our hospital. 26.32% had multiple injuries and 50% of the population had disc or posterior ligamentous complex injures. The majority (55.56%) had level 2 spinal cord injuries according to the ICD-10 classification. The majority had thoracic (T1-T12) spinal injuries (55.56%), while 33.2% and 11.2% had cervical and lumbosacral spinal injuries respectively. 52.4% had complete ASIA (American Spinal Injury Association) level A injuries while 47.6% had incomplete injuries out of which 9.5% and 38.1% had ASIA B & C level injuries respectively.

The average time of delay to the Rheumatology and Rehabilitation Hospital (RRH) was 126.05 days, which ranged from 15 to 703 days. Mean length of hospital stay for rehabilitation in our hospital was 143.5 days (SD 69.28).

## **DISCUSSION**

Most of the socio-demographic data of our study are compatible with other international studies. Majority of the population affected were married young males with low level of education, who were engaged in elementary, agricultural or fishery occupations, which indicate the effect of traumatic spinal injuries to the economy of the country as most were an important part of the nations' work force.

Risk factor analysis revealed that 94.4% SCI were blunt injuries where the majorities were due to falls occurred during occupational activities, followed by road traffic accidents and falls during recreational / house hold activities respectively. 78.9% of the injuries occurred during weekdays while 47.3% of the injuries took place during routine working hours. We believe that these data can be extremely useful in selecting target populations for future SCI prevention programmes in the region.

Injury severity analysis revealed that majority had thoracic spinal injuries with 95.24% had vertebral injuries and 50% of the population had disc or posterior ligamentous complex injures.

52.4% had severe complete ASIA (American Spinal Injury Association) level A injuries. However, we

firmly believe that data on disease severity has been biased by the fact that as a well established tertiary care center most of the patients referred to us have severe injuries with significant disabilities.

A significant delay in admitting these patients to the RRH for long term rehabilitation was noted indicating that urgent actions are warranted in improving the knowledge on importance of rehabilitation among SCI patients and health care workers. It also indicates that further studies are needed to analyze the factors which have contributed to this significant delay.

### **CONCLUSION**

Prevention is the best way to reduce the burden of SCI on health sector and society. SCI epidemiology and risk factors identified in this study can be highly useful in improving methods of prevention.

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<http://www.health.gov.lk>

Personal communicates from relevant hospitals

# COMPARING HAMSTRING FLEXIBILITY BETWEEN THE TRANSTIBIAL PROSTHETIC WEARERS AND THE CONTROL SUBJECTS AND ASSESSING FACTORS ASSOCIATED WITH HAMSTRING FLEXIBILITY

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## Abstract

Hamstring flexibility is necessary for mobility in transtibial prosthetic wearers. The aim of this study was to compare hamstring flexibility of transtibial prosthetic wearers and non-amputees and to assess factors associated with hamstring flexibility. A descriptive comparative study was carried out with participation of 50 male transtibial amputees who were prosthetic wearers and 50 male control subjects who were non-amputees. Study population mean age was 55.66 years (SD  $\pm$ 11.455) in transtibial prosthetic wearers while it was 51.28 years (SD  $\pm$ 10.784) in control subjects. Data related to amputation were collected by using an interview-administered questionnaire and hamstring flexibility was assessed using the back saver sit and reach test. Statistical analysis was done by using statistical package for social sciences 16.0 version. The study revealed that, hamstring flexibility has significant relationship ( $p=0.001$ ) with transtibial prosthetic wearers and control subjects. Further, the younger age ( $p=0.002$ ) and participation of prosthetic rehabilitation programme ( $p=0.005$ ) have significant relationship with hamstring flexibility. whereas it has no significant relationship ( $p>0.05$ ) with educational level, engaging in sports activity, reason for amputation, post prosthetic period, timing of wear the prosthesis and duration of participation of prosthetic rehabilitation programme. . It can be concluded that hamstring flexibility of transtibial prosthetic wearers is lower than non-amputees. In addition to that, age below fifty and Prosthetic rehabilitation programme was associated with better hamstring flexibility among transtibial prosthetic wearers.

**Keywords:** Hamstring, flexibility, transtibial amputee, prosthesis, age, rehabilitation.

## INTRODUCTION

Flexibility is recognized as important components of physical fitness. Poor flexibility in the hamstrings and lower back are the causes of muscular pain in the lower back, gait limitation, poor posture and increased risk of falling in older adults. In lower limb amputation, it has been theorized that hamstring length is a critical component for maintenance of proper lumbar curvature. Tightness in the hamstring muscles can pull the pelvis into a posterior tilt, decreasing the lordosis of the lumbar spine, leading to poor attenuation of forces and an increase in anterior compression forces of the lumbar spine. Hamstring

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flexibility is necessary for mobility in transtibial prosthetic wearers.

There are some articles say: "Joint contractures are serious problem that might affect prosthetic fitting and proper gait, and also it will increase the energy needs during locomotion". Just after post-operative period if the patient has not started the full range of motion, contracture can be developed in proximal to the amputation site (8). Amitabh J et al (53) report in this research, 19 days after transtibial amputation some patients had 15 degree of fixed flexion deformity at the knee. Also after prosthetic fitting, many patients ignore stretching after they start to walk again. As a result, hip and knee flexion

contractures may develop (3). Severe knee flexion contractures cannot be reduced by exercise once they become fixed. Thus, developing contracture is serious complication of amputees (9). It will reduce their functional activities. Therefore, they will become depended people in the society. Maintaining hamstring flexibility is one of the most important to reduce their dependency. We can improve hamstring flexibility through proper rehabilitation programme. However, amputees give less attention to rehabilitation training or other special needs (3). Therefore, through this current study, we can improve the patient attention towards the rehabilitation programme.

To date there is no research about hamstring flexibility in transtibial prosthesis wearers. In Sri Lanka to date, there is no related literature, which supplies any evidence to prove hamstring flexibility between transtibial prosthetic wearers and control subjects. At this stage in Sri Lanka, there are many transtibial amputees due to war injuries resulting in increase of dependent people. It can affect the development of our country. There is need of research about hamstring flexibility in transtibial prosthetic wearers.

Therefore, this research aims at assessing whether there is a difference in hamstring flexibility between transtibial prosthetic wearers and control subjects. In addition, assessing factors associated with hamstring flexibility. This study would be helpful to Sri Lankan society.

### **Research Objectives**

#### ***General objective***

- To compare hamstring flexibility between transtibial prosthetic wearers and control subject and assessing factors associated with hamstring flexibility.

#### ***Specific objectives***

- To assess hamstring flexibility in transtibial prosthetic wearers using back saver sit and reach test

- To assess hamstring flexibility in control subject using back saver sit and reach test.
- To compare hamstring flexibility between below knee amputees with prosthetic leg and control subjects.
- To assess the factors affecting the level of hamstring flexibility of the transtibial prosthetic wearers

### **METHODOLOGY**

This section illustrates the details about study design, study setting, study population with inclusion and exclusion criteria, sample size and study materials. Later part of the chapter consists of data collecting procedure along with a short description regarding data analysis.

#### **Study Design**

This study was a descriptive comparative study and the study was conducted between February 2013 and June 2013 during 9am to 12pm

#### **Study Setting**

Both transtibial prosthetic wearers and control subject were selected from Colombo Friend-in –need Society, Colombo 2.

#### **Sampling Method**

A convenient sampling method was used for selecting the participants. In this method, all the eligible study units and controls were included in the study in a consecutive manner. The researcher did not previously know the participants.

#### **Study Sample**

The study was conducted in two groups: Lower limb amputees who were transtibial prosthetic wearers and a group of non-amputees males as the control group.

Inclusion criteria specified for transtibial amputees who are prosthetic wearers:

- Age between 23-73 male who used prosthesis for more than 1 year.
- No history of fracture in either lower limb

- No history of injury in hamstring muscles (either lower limb)

Exclusion criteria specified for transtibial amputees who are prosthetic wearers:

- Mental illness and serious illness
- Professional Dancers
- Deformity in both lower limb
- Neurological deficits and musculoskeletal disorders which affect hamstring flexibility

Inclusion criteria specified for controls who are non-amputees:

- Age between 23-73 male
- No history of fracture in both lower limb
- No history of injury in hamstring muscles (both lower limb)

Exclusion criteria specified for control who are non-amputees:

- Mental illness and serious illness
- Professional Dancers
- Deformity in both lower limb
- Normal subjects who have neurological deficits and musculoskeletal disorders, which affect hamstring flexibility.

### **Sample Size**

The study subjects were 50 transtibial prosthetic wearers who have worn prosthesis more than one year and 50 control subjects. The total sample was 100 participants (n=100)

### **Data Collection Instruments**

Data was collected in two methods, which are administering a questionnaire and doing measurements.

1. Interview administered questionnaire:

Socio demographic data was included as first part of questionnaire.

Information related to amputation like level of amputation, reason for amputation, duration of amputation, how long have they used prosthesis, whether they were using/used walking aids, how many hours have they wear prosthesis, did they participate rehabilitation programme were included as last part of questionnaire.

### **2. Measurements:**

Measuring device was used to measure muscular flexibility. This test is called as back saver sit and reach test. This equipment was prepared according to the standard methods (55).

Following is a description of how the measurements were done. Participants was advised to remove the shoes and sit facing the flexibility measuring device with fully extended one knee and foot flat against the end of box. Then they were advised to bend the other knee so that sole of the foot flat on the floor and 7-10 cm to the side of the extended knee and hands put on top of each other (tips of the middle fingers even), with their palms down. When performing test participant were asked to reach as far as forward, while sliding their hands along the box scale as far as possible. They were instructed to hold the position of maximum reach for about two second and the distance of maximum reach was recorded to the nearest centimeters. Average of three trials on each limb was recorded for analysis.

Participants had to perform the exercise two times. Warm up exercises, stretching and relaxing exercises had been carried at the beginning and at the end of the performing back saver sit and reach test.

### **Data Collection Procedure**

The data collection was carried out at the above study setting. Prior to administering of the information sheet, eligible study unit were educated about the study. Written informed consent was taken from participants after reading the distributed information sheet, which included the purpose, the nature of the study and the potential benefits of the research. Then, the principal investigator according to their answers filled the interviewer-administered questionnaire. The principal investigator did all the measurements by her. She provided specific instruction to these individuals on how to complete the back saver sit and

reach test and measured the hamstring flexibility. Transtibial amputees were asked to wear prosthesis during measures. These measurements were taken at a time convenient to the participants. Each measurement was taken three times using the same measuring equipment. The mean of three values were taken for the accuracy of data.

### Data Validation

The principal investigator according to their answers filled all questionnaires. She used simple language without medical terms and it was understandable to the participant's educational state. For the unclear parts further explanation was provided

The same measuring equipment was used to take the measurements and the principal investigator took all the measurements. To ensure the accuracy all the measurements were taken for three times.

### Data Analysis

Data was analyzed by the principal investigator with help of supervisor using the SPSS (Statistical Package for Social Sciences) version 17.0 software on a personal computer.

The socio-demographic characteristics of the study population were described using frequency distributions and the mean age of the two groups were calculated. In addition, information related to amputation was described using frequency distribution.

Mean values of hamstring flexibility of transtibial prosthetic wearers and control subject were calculated. The independent sample test was used for comparisons between the two groups. Paired sample test was used for comparisons within the group. A p value of 0.05 was be used to determine the significance.

Factors were cross tabulated to the two different levels of hamstring flexibility and their associations were assessed using the chi square test. Age, educational level, sports activity, reason for amputation, post-prosthetic period, timing of wear the prosthesis, participation of prosthetic rehabilitation programme and duration of participation of prosthetic

rehabilitation programme were the factors which were assessed for its association with hamstring flexibility.

The participants with a measurement of 20.33cm or more were categorized as having above average hamstring flexibility while those with a measurement 20.32 or below categorized as having below average hamstring flexibility (29,47,48). This cut off mark was decided prior to analysis of data in consultation with supervisor.

### RESULTS AND ANALYSIS

Table 1 shows the frequency distribution of the basic characteristics of study population

Table 1: Frequency distribution of basic characteristics of study population

Demographic information of study population	Transtibial prosthetic wearers	Control subject
Mean age	55.66	51.28
<i>Civil Status</i>		
Single	7 (14)	2 (4)
Married	43(86)	48(96)
<i>Educational level</i>		
No schooling	1 (2)	2(4)
Grade 1-5	11 (22)	16 (32)
Grade 6-11	19 (38)	16 (32)
G.C.E O/L	12 (24)	7 (14)
G.C.E A/L	6 (12)	5 (10)
Graduate	0(0)	3 (6)
Vocationally trained	1(2)	1 (2)
<i>Sports Activity</i>		
Not participated	47 (94)	48 (96)
Cricket	2 (4)	2 (4)
Karate	1 (2)	0 (0)

Table 2: Frequency distribution of information related to amputation among transtibial prosthetic wearers

Information related to amputation among the transtibial prosthetic wearers	No (Percentage)
<i>Amputation periods ( years)</i>	
1.5-6.4	30 (6)
6.5-11.4	5(10)
11.5-16.4	4(8)
16.5-21.4	5(10)
21.5-26.4	4(8)
≥ 26.5	2(4)
<i>Reason for amputation</i>	
Vascular disease	8 (16)
Diabetes	12(24)
Trauma	30(60)
<i>Amputation level between the knee and ankle</i>	
Upper	30
Middle	16
Lower	4
<i>post prosthetic period (years)</i>	
1-5	31 (62)
6-10	5 (10)
11-15	4 (8)
16-20	7(14)
21-25	1 (2)
≥26	2 (4)
<i>Hours of wearing the prosthesis at home (per day )</i>	
3	2
4	1
5	9
6	6
7	2
8	11
9	3
10	8
11	2
12	6
<i>Participate any prosthetic rehabilitation programme</i>	
Yes	27
No	23

Table 3: Frequency distribution of different categories of hamstring flexibility (average of both legs) between transtibial prosthetic wearers and control subjects

Hamstring flexibility categories (cm)	Transtibial prosthetic wearers		Control subjects		Independent sample test
	No.	Percentage	No.	Percentage	
1-5.50	3	6	1	2	
5.51-10.01	11	22	3	6	
10.02-14.52	10	20	8	16	t= -3.500
14.53-19.03	13	26	7	14	
19.04-23.54	5	10	20	40	
23.55-28.05	7	14	6	12	
≥28.06	1	2	5	10	df=98
					p=0.001
Total	50	100	50	100	

Minimum value for hamstring flexibility in the group of transtibial prosthetic wearers was 1.12 cm and the maximum was 43.50cm with a mean value of 15.1913cm (SD ±6.70752). Minimum value of hamstring flexibility in the group of control subject was 3.85cm and maximum was 32.55cm with a mean

value of 19.7740cm (SD ±6.38178). The mean value of hamstring flexibility in control subject was significantly higher than the transtibial prosthetic wearers (t= -3.500; df=98; p=0.001).

Table 4: Frequency distribution of hamstring flexibility between amputated leg and non-amputated leg in transtibial prosthetic wearers

Hamstring flexibility categories (cm)	Amputated leg		Non amputated leg		Paired sample test
	No.	Percentage	No.	Percentage	
1-5.50	2	4	4	8	
5.51-10.01	7	14	10	20	
10.02-14.52	16	32	10	20	
14.53-19.03	9	18	14	28	
19.04-23.54	10	20	4	8	t= 1.706
23.55-28.05	5	10	7	14	
≥28.06	1	2	1	2	df=49
					p=0.094
Total	50	100	50	100	

Minimum value for hamstring flexibility in the group of transtibial prosthetic leg was 1.17 cm and the maximum was 31.73cm with a mean value of 15.5253cm (SD  $\pm$ 6.69873). Minimum value of hamstring flexibility in the group of non amputee leg was 1.07cm and maximum was 31.47cm with a mean value of 14.8573cm (SD  $\pm$ 6.99598).

The mean value of hamstring flexibility in transtibial prosthetic leg was higher than the non amputee leg. However, this difference was statistically not significant ( $t= 1.706$ ;  $df=49$ ;  $p=0.094$ ).

Table 5: Frequency distribution of affecting factors and hamstring flexibility

Factors	Below average hamstring flexibility ( $\leq 20.32$ cm)		Above average hamstring flexibility ( $\geq 20.33$ cm)		Significance
	No.	%	No.	%	
Age group					$\chi^2 = 9.426$
$\leq 50$	9	23.1	8	72.7	$df=1$
$\geq 51$	30	76.9	3	27.3	$p=0.002$
Educational level					
G.C.E.O/L not complete and lower					$\chi^2 = 1.639$
G.C.E.O/L completed and higher	26	66.7	5	45.5	$df=1$
	13	33.3	6	54.5	$p=0.201$
Sports activity (before amputation)					
Yes					$\chi^2 = 0.239$
No	2	5.1	1	9.1	$df=1$
	37	94.9	10	90.9	$p=0.625$
Reason for amputation					$\chi^2 = 0.952$
Non traumatic	17	43.6	3	27.3	$df=1$
Traumatic	22	56.4	8	72.7	$p=0.329$
Post prosthetic periods(years)					$\chi^2 = 0.466$
1-15.5	32	82.1	8	72.7	$df=1$
15.6-30.1	7	17.9	3	27.3	$p=0.495$
Timing of wear prosthesis (hours)					
1-7	15	38.5	5	45.5	$\chi^2 = 0.175$
8-12	24	61.5	6	54.5	$df=1$
					$p=0.676$
Participate any prosthetic rehabilitation programme.					$\chi^2 = 7.734$
Yes	17	43.6	10	90.9	$df=1$
No	22	56.4	1	9.1	$p=0.005$
Period of participate in prosthetic rehabilitation programme. (weeks)					$\chi^2 = 3.038$
1-3	6	35.3	7	70	$df=1$
4-48	11	64.7	3	30	$p=0.081$

Younger age ( $p=0.002$ ) and participation of prosthetic rehabilitation programme ( $p=0.005$ ) were found to be significantly associated with having an above average hamstring flexibility. Educational level, engaging in sports activity, reason for amputation, post prosthetic period, timing of wear the prosthesis and duration of participation of prosthetic rehabilitation programme were not found to be significantly associated with a having an above average hamstring flexibility.

## DISCUSSION

This chapter consists of an evaluation of the results and research findings in respect to existing literature.

In current study, hamstring flexibility was assessed in both legs in transtibial prosthetic wearers and control subjects. Hennessey et al (54) has done a study about flexibility and posture assessment in relation to hamstring injury by using injured and non-injured athletes. In that study, they compared mean (SD) of both legs between the injured and non-injured groups. Results indicated no difference in flexibility between the injured and non-injured groups. Thus, in current study also mean value of both legs was compared between the transtibial prosthetic wearers and control subjects.

The finding indicated that transtibial prosthetic wearers had significantly lower hamstring flexibility than control subject ( $t= -3.500$ ;  $df=98$ ;  $p=0.001$ ). This may be due to the fact that physically active people have better flexibility than those who are not (34). In current study, after amputation, a majority (70%,  $n=35$ ) of transtibial prosthetic wearers who were employed before were not employed. Only 8% ( $n=4$ ) of control subjects were not employed. Also, as indicated earlier, most of the transtibial prosthetic wearers neglect the stretching programme once begin to walk, resulting in hamstring contracture(3). Furthermore, "Tidy's physiotherapy" by Ann (50) shows that postoperatively there is a tendency to develop the knee flexor contracture in below knee amputees. The literature to date does not conclusively support this result between the transtibial prosthetic wearers and control subject. There is no related literature about hamstring flexibility between transtibial prosthetic wearers and control subject. More investigations are clearly needed on this aspect in the future studies.

Hennessey et al (54) concluded that, no difference was observed between the injured limp hamstring flexibility and the non-injured limp hamstring flexibility for injured subjects. In current study also, statistical analysis of hamstring flexibility between the amputated leg and non-amputated leg in transtibial prosthetic wearers was not found to be significantly different. However, the mean value of hamstring flexibility in amputated leg was higher than the non amputated leg. This may be due to the fact that amputees put more stress on their intact limp during mobility and daily activities (16). Thus, this tendency can cause degenerative changes in their intact limb (16), resulting it can affect the flexibility of intact limb muscles. Furthermore, contractures can develop intact limb hip flexors, knee flexors and plantar flexors in lower limb amputees due to prolonged bed rest in the comfortable semi-Fowler position(3).

Jiabei (49) has done a study about physical fitness performance of young adults with or without cognitive impairment by using 75 young adults including 41 without disabilities and 34 with mild cognitive impairments. It showed young adults with cognitive impairments have significantly poorer flexibility than the young adults without disabilities. Another study on physical fitness of lower limb amputees by Chin (7) using 31 amputees and 18 abled bodies. In that study had shown that the  $VO_{2max}$ , AT, and maximum workload for the amputees were  $18.8 \pm 4.9$  ml/kg/min,  $12.8 \pm 2.0$  ml/kg/min, and  $67.6 \pm 20.2$  W, respectively. The equivalent figures for the able-bodied group were  $23.5 \pm 3.2$  ml/kg/min,  $14.3 \pm 1.6$  ml/kg/min, and  $102.4 \pm 33.6$  W. The values of the amputees has significantly lower than the abled bodies ( $p<0.005$ ). This indicates that more comparative studies are needed to study the flexibility of transtibial prosthetic wearers.

The book "The Brockport Physical Fitness Test Manual" By Joseph (29) had shown that youngsters with amputation and youngsters without disabilities has same level of flexibility between the non amputated leg in amputee person and youngsters without disabilities. In contrast to this, the current study showed that mean value of hamstring flexibility in control subject was higher than the non amputated leg in transtibial prosthetic wearers. According to the

statistical analysis this difference between the two groups were shown a significant relationship. ( $t= -3.671$ ;  $df=98$ ;  $p=0.000$ ). This may be due to the fact that the present studies included persons who are age between the 23 to 73. Whereas the present study had not only youngsters but also elders.

### **Factors Affecting the Level of Hamstring Flexibility of the Transtibial Prosthetic Wearers**

In the current study, age, educational level, sports activity, reason for amputation, post prosthetic period, timing of wear the prosthesis, participation of prosthetic rehabilitation programme and duration of participation of prosthetic rehabilitation programme were the factors, which were assessed for its association with hamstring flexibility.

Of these factors, a higher proportion of transtibial prosthetic wearers below 50 years of age had above average hamstring flexibility. In present study, being younger was found to be significantly associated with above average hamstring flexibility. The literature to date does not conclusively support this result in transtibial prosthetic wearers. As indicated earlier, physical fitness is highly important of mobility in lower limb amputees (7) and flexibility is recognized as an important component of physical fitness. Thus, flexibility may directly or indirectly affect mobility in transtibial prosthetic wearers.

Both the present age of patient and the age at amputation were not found to be factors associated with the outcome of success in rehabilitation among the amputee in the study conducted by Chan et al in the Department of Geriatrics Medicine, Tan Tock Seng Hospital, Singapore (51) but mobility rates of these amputees after one year of prosthetic fitting had worsened with increasing age at amputation in the study conducted by Davies et al in Northern General Hospital, Sheffield, England (45).

In present study, participation of prosthetic rehabilitation programme was found to be significantly associated with having an above average hamstring flexibility. The literature to date does not conclusively support this result in transtibial prosthetic wearers.

In present study, educational level, sports activity, reason for amputation, post prosthetic period, timing

of wear the prosthesis and duration of participation of prosthetic rehabilitation programme were not found to be significantly associated with a having an above average hamstring flexibility. Even this result is not conclusively supported by the literature on studies among transtibial prosthetic wearers.

The study to compare the lower body flexibility, strength and knee stability between 9 karate athletes and 15 non-athletes. Results indicated that this group of karate athletes demonstrated significantly greater hamstring flexibility (39). In contrast to this, current study indicated that participating in sports activity was not associated with a having a above average hamstring flexibility. However, it should be noted that the current study included transtibial prosthetic wearers and only few of them ( $n=3$ ) are participated in sports activity. Thus, it can be reason for contrast results of two studies.

The study conducted by Johnson et al in United States Of America (46) comparing pre and post amputations mobility and the influence of age and associated medical problems among 120 male patients who undergone unilateral transtibial amputations. They found that, either cardiac disease or diabetes mellitus lowered post amputation mobility score and peripheral vascular disease lowered pre amputation mobility score. However, they also found that cause of amputation did not influence the mobility scores. Physically active people were found to have better flexibility than those who are not (34). As indicated earlier, mobility may directly or indirectly affect the flexibility in transtibial prosthetic wearers. In current study also, the cause of amputation was not found to be significantly associated with a having an above average hamstring flexibility.

Miller et al (35) reported that those who underwent lower limb amputation long before reported relatively higher level of balance confidence. In contrast to this, in current study, post prosthetic period was not found to be significantly associated with hamstring flexibility. This may be due to the fact that varies with age at amputation, education level, included were not only youngsters but also elders and participation of rehabilitation programme. More investigations are clearly needed on this aspect in the future studies.

## CONCLUSIONS

- Hamstring flexibility of transtibial prosthetic wearers is lower than non-amputees.
- Age below fifty and Prosthetic rehabilitation programme was associated with better hamstring flexibility among transtibial prosthetic wearers.
- Educational level, engaging in sports activity, reason for amputation, post prosthetic period, timing of wear the prosthesis and duration of participation of prosthetic rehabilitation programme were not found to be associated with an above average hamstring flexibility.

## RECOMMENDATIONS

- Prosthetic rehabilitation programme is recommended to all transtibial prosthetic wearers to improve hamstring flexibility.
- More extensive studies to assess hamstring flexibility among transtibial prosthetic wearers are recommended to fully understand the issues among transtibial prosthetic wearers.
- As study setting and the sample size is limited in the current study, it is highly recommended to conduct a similar study among a large population of transtibial prosthetic wearers in Sri Lanka.
- More extensive studies to need for increasing the validity of back saver sit and reach test among the transtibial prosthetic wearers.

## LIMITATIONS

Compared with other studies sample size of this study was small and contains only male subjects within the particular age group. Another limitation was the selection of study population. The study sample was selected only from one setting. Thus, the finding results may not representative the entire transtibial prosthetic wearers and control subject. Current study did not include an assessment of different type of prosthetic device, which is affecting the mobility of

the amputees. Thus, this may directly or indirectly affect flexibility in transtibial prosthetic wearers.

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