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Factors Affecting Patient Compliance with Upper Limb Bracing Following Physical Therapy

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Abstract

Background: The lack of patient compliance with upper limb bracing results in delayed healing, progression of deformity, and sometimes even permanent disability. Common upper limb musculoskeletal disorders require bracing and physical therapy, but patient non-compliance with bracing is widespread. The study aims to identify the factors that result in non-compliance with upper limb bracing following physical therapy, thus affecting the patient's recovery from injury.

Methods: A cross-sectional descriptive study on total of 300 patients between ages 20-50 was conducted at Centre of Benzair Bhutto Hospital. A self-designed questionnaire was used to evaluate the history and factors affecting patient compliance. Orthotic Prosthetic user survey form was used to assess non-compliance with the brace.

Results: Out of a total of 300 patients, 100 (33.3%) subjects correctly used the brace, 115 (38.33%) subjects did not use the brace, and 85 (28.33) subjects used the brace but did not use it as advised by the orthotist. Out of 115 non-users, 75 patients could not afford the brace, and 40 patients thought they were improving with physiotherapy, so there was no need to use the brace. The most common factors affecting patient compliance with bracing following physiotherapy are either the brace being uncomfortable (36.4%) or discomfort at night (18.8%).

Conclusion: Patient's compliance was reported following physiotherapy, though the participants were reluctant to use the brace due to high cost and discomfort. Efforts to decrease the cost of brace, and discomfort may be beneficial in increasing compliance with bracing treatment following physiotherapy

Keywords:

Compliance, Non-Compliance, Orthotics, Orthoses Physiotherapy.

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Introduction

A brace or splint supports the limbs or spine to prevent or assist relative movement. The word "Ortho" originates from Greek word, which means to straighten or align[1]. Braces or splints are categorized into different types, depending upon the body section, like upper limb braces, lower limb braces, spinal braces, and vice versa. The upper limb is one of the most important parts of the body that possesses the functional ability to perform daily activities, self-care duties, hobbies and sports. Upper limb rehabilitation following acute injury will help the patient restore the mobility and strength of the upper limb so that they can perform their activities of daily living independently[2-3].

An upper limb orthosis is an external instrument intended to enhance the operation and layout of the different areas in the top limb. Upper limb orthosis is further characterized into many types like Arm orthoses, fracture braces, Functional arm orthoses, Forearm-wrist orthoses, Forearm-wrist-thumb orthoses, Forearm-wrist-hand or those, Hand orthoses, Upper-extremity orthoses (with special functions)[4]. For the most part, musculoskeletal conditions that may be alleviated with upper limb orthoses/ braces are those arising from damage or disease[5]. They may likewise be gainful in helping people who have endured neurological impedance, for example, stroke, spinal string harm, or fringe neuropathy[6-7].

According to WHO (2003) compliance or adherence to the treatment is "the extent to which a person's behavior follows medical advice or corresponds with recommendations from the health care provider". Compliance with upper limb bracing is an essential precondition for the successful recovery from upper limb musculoskeletal disorders. In orthotic intervention, the changes are not visible at once, and they take form gradually over time, sometimes perhaps a large amount of time. It is, therefore, necessary to comply with the advice and prescription given by a physiatrist and PNO to obtain maximum results and benefits from the intervention. It is usually seen that proper compliance leads to better results both physically and mentally[8]. Patient's non-compliance to a bracing schedule following physiotherapy can affect treatment outcomes and recovery, increase the risk of disability, and cause unfair assessment of treatment effectiveness, especially in the case of assistive devices[9-10].

Sometimes, patients fail to comply with the prescription, which depends on many factors. It is there for necessary to root out the exact causes of non-compliance[11-12]. Identifying the problem is the first step in fixing problems. Instead of being assertive, sometimes a counselling approach must be utilized to achieve patient compliance[13]. The problem of enforcement is a challenge confronting all practitioners, particularly those of pediatric patients. "Orthosis would not work if

kept in the closet" is a sentence you probably use in your conversation with the patients' families. It is, therefore, necessary to identify all the causes of non-compliance and provide a solution[14]. In the majority of cases where non-compliance occurs, it results in delayed healing, progression of deformity, and sometimes even permanent disability[15-16]. All these factors, in turn, result in substantial economic and workforce losses to the country, which could have been utilized altogether in pursuing a common goal of national and individual prosperity and greater productivity alongside reduced poverty[17-18].

Methodology

A Descriptive cross-sectional study was conducted from December 2020 to July 2021 at the Orthopaedic Rehabilitation Centre of Benazir Bhutto Hospital (BBH), Rawalpindi. A non-probability convenient sampling technique was used to select 300 male and female patients who were prescribed seven types of upper limb orthosis along with physiotherapy for musculoskeletal disorders. The patient's age was between 20 to 50 years. The study was initiated after the agreement of the Advanced Study & Research Committee (ASRC) of the Rehabilitation Institute of ISRA, the Islamabad University of ISRA and the BBH Director of the Orthopedic Rehabilitation Centre. The data were collected through the questionnaire/forms. The General demographic questionnaire, which included age, gender, education, marital status, and socioeconomic status, was used. A History form was used to evaluate history and factors affecting patient compliance. The Orthotic Prosthetic user survey form was also used to assess non-compliance with the brace. The data was analyzed using SPSS 21.

Results

A total of 300 subjects were recruited, out of which 170 were male and 130 were female with mean age of 36±3.22 years. Out of 300 patients 100 were totally compliant with bracing and 200 were non-compliant. The results as mentioned in Table-1, showed that the 100 (33.3%) subjects properly used the brace and 115 (38.33%) subjects did not use the brace, while 85 (28.33%) subjects used the brace but not used as advised by the orthotist, they removed the brace frequently.

Table-1 Types of bracing

Type of bracing	Number of Complaint patients	Number of non-complaint patients	Device not properly used
Wrist Hand Orthosis	30	10	4
Thumb spica splint	15	27	26
Aeroplan splint	10	4	18

Elbow orthosis	19	20	15
Finger splints	8	19	13
Cooper Compression Wrist Brace	4	3	19
Fracture Braces	14	3	20
Total	100	85	115

The main reasons for non-compliance were found to be non-affordability of brace by the patient and the perception that he is getting improvement with physiotherapy without brace. Out of 200 non-compliant patients, 115 were unable to afford the prescribed brace and 40 (34.7%) patients thought that they are improving with physiotherapy so there is no need to use the brace. Among 115 patients who were unable to properly use brace, (36.4%) complaint of comfortability, (18.8%) complaint of discomfort during night, so patients removed the brace at night time despite of the fact that are advised to use the brace at night time also (Figure 1 and 2).

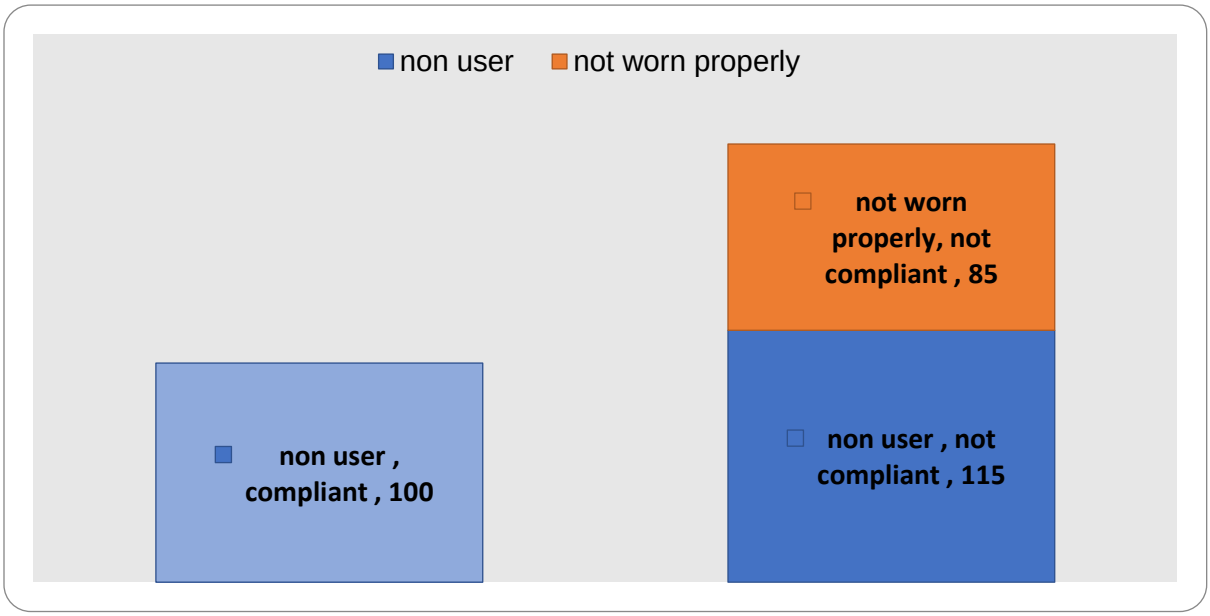

Figure-1 Frequency of Compliance with Brace

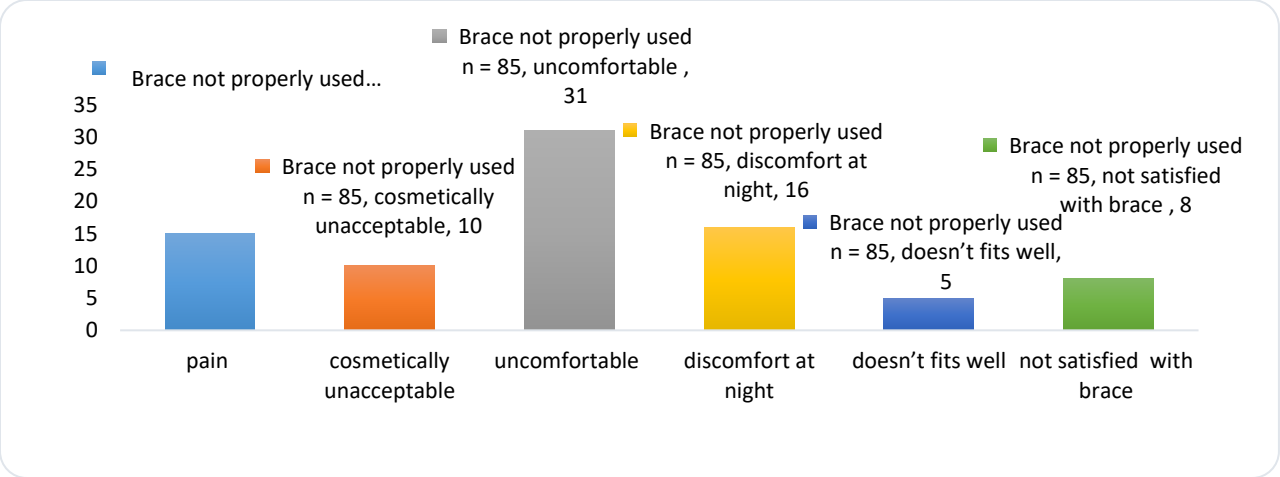

Figure-2 Factors Affecting Compliance with Brace

Discussion

The results of this study showed that most common factors affecting the patient's compliance are the high cost and discomfort specifically at night. Out of 300 participants, 115 were reluctant to use brace. 75 patients reported the unaffordability while 40 patients didn't consider the use of brace since they were improving with physiotherapy.

Based on the previous literature available, this level of compliance has been found to be in agreement with conclusions of different studies. Di Fabio et al. (2023) , conducted a cross sectional study in which the rate of compliance with physical therapy ranged from 85% to 89% in patients suffering from orthopedic diseases[19]. This study is in line with our results regarding patients considering physiotherapy as the most appropriate option as compare to bracing. Contrary to this, a cohort study was conducted by Derek J in January 2010 on the indication of arthroplasty after the non-operative treatment option showed no improvement in reducing pain and improving physical function. Patients were given immobilizers to reduce pain but showed no significant improvement[20]. Another study conducted by Florian Grubhofer (2019), a comparative analysis between sensory based and self-compliant braces, found that 50% of patients didn't wear the brace at least 80% of the recommended time. Thus self-reported compliance is noticeably lower than sensor-based compliance[21]. Additional research was carried out in the Milliken Hand Recovery Centre, Barnes Hospital, St. Louis, Missouri, on the impact of conformity on the rehabilitation of patients with Mallet Finger Injuries[22]. Same tools were used in majority of the previous studies showing similar findings[23-24]. It has been observed in other bracing trials, as causes for non-compliance are both postulated variables such as pain, bad fits, discomfort, skin sensitivity and conditions such as sleep disorder.

Multiple researchers report that between 25 to 30 % of braces are not used as advised[25]. According to the present study, 38.33% subjects did not use the brace, while 28.33 subjects used the brace several times but did not use every day as advised by the orthotist, they removed the

brace frequently. So the results of presents study are almost similar to the past studies done. Orthotic braces are used to correct, heal, slow down the progress of deformity. The brace works by stabilizing and providing support to the extremity. Observing the rate of correction or the duration in which healing occurs, one notices that duration takes more than estimated time in significant number of cases. The study started based on this observation. As the study progressed, the noticeable observation was that of compliance rate, which was low among a noticeable number of patients.

Conclusion

The idea of orthosis is based upon gradual correction, healing and maximum stability. The changes do not occur overnight. A significant amount of time is required to recover. Patients believed that their device is not working so it is not feasible to wear the device. If it "doesn't work". Thing is they should be counseled probably and should be explained, that the brace is not some miraculous pill, that can heal your deformity overnight. It takes time for the brace to work. Many factors were identified in the study, which lead to non-compliance. Two main factors identified are Economical Impediments and Cultural Impediments. Efforts to decrease the cost of brace, and discomfort may be beneficial in increasing compliance with bracing treatment following physiotherapy.

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Conflict of Interest
None.

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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

Conception or Design: Shahzad H

Acquisition, Analysis or Interpretation of Data: Rehman Z

Manuscript Writing & Approval: Asif S

All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.