

Title : Is custom made lower limb Orthosis beneficial for in post polio residual paralysis patients?

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ABSTRACT -

Objective : The purpose of this study was to find out the usefulness of custom made lower limb orthosis in post polio residual paralysis patients **Design :** Cross sectional Study. **Setting :** Department of Neuro Physiotherapy, Tertiary Hospital and Villages around Ahmednagar, Methods: This study was conducted between January 2009 - November 2010. Fifty participants from both gender, aged between 12 to 45 and those who met all the eligibility criteria were included. Results: The results of the study revealed that the discontinuation of lower limb orthoses was 72% in males and in females it was 64% .For Hip knee ankle Orthosis discontinuation was (86%) followed by Ankle foot orthosis (84%). **Conclusion :** We concluded that discontinuation of lower limb orthoses was more in males compare to females and the reason was physical intolerance.

Introduction : More than 1,000,000 survivors of poliomyelitis living in India about 80% experience symptoms associated with Post-Polio syndrome. Weakness, fatigue, & pain are the common symptoms that may appear in Post-Polio syndrome. It has been found that the new symptoms in Post-Polio survivors, which may be classified as Post-Polio syndrome, increase their walking & climbing stairs disability, increase their disability to perform daily activities & also decrease their satisfaction with life^[1]. Persons living with the effects of polio are often at increased risk for development of various condition & disabilities that can lead to further decline in health status, independence, functional status, life satisfaction & overall quality of life. Earlier studies indicate that various physical & mental conditions are prevalent &

associate with decrease life satisfaction. Prompt identification & treatment of these related condition before they progress to greater impairment & or disability & attention to an overall healthful lifestyle is important to preserve function & maintain quality of life of Post-Polio syndrome survivors^[1,2].

People suffering from post-polio residual paralysis require extensive orthotic & therapy interventions. The most common orthoses to be seen anywhere in developing countries are still the heavy metal calipers or braces fitted with mandatory orthopedic boots.^[1, 3] Most of the conventional lower limb orthoses designed & developed on western standards overlook innate problems of the rural areas in India where the floor is used for various activities like sitting, sleeping, eating, working, worshipping, toileting etc. Squatting & cross leg sitting has been a tradition. Due to warm climate closed shoes are uncomfortable. Most people walk barefoot or in open well-ventilated footwear. Barriers in the form of steps, staircase, & thresholds on doors make mobility of locomotors disabled more restricted^[3, 4]. Over & above this, few reports available in the literature indicate that there is a large dissatisfaction or low acceptability rate of the lower limb orthoses^[3-5]. There has been very little research data on patient's satisfaction with lower limb orthoses especially in the rural areas of our country. Thus this study has been undertaken to find out the level and reasons for rejection of lower limb orthosis by using questionnaire.

Key words : "Post-Polio Residual paralysis, Hip-Knee-Ankle-Foot-Orthosis" (HKAPO'S), "Knee-Ankle-Foot-Orthosis" (KAPO'S), "Ankle-Foot-Orthosis" (APO'S).

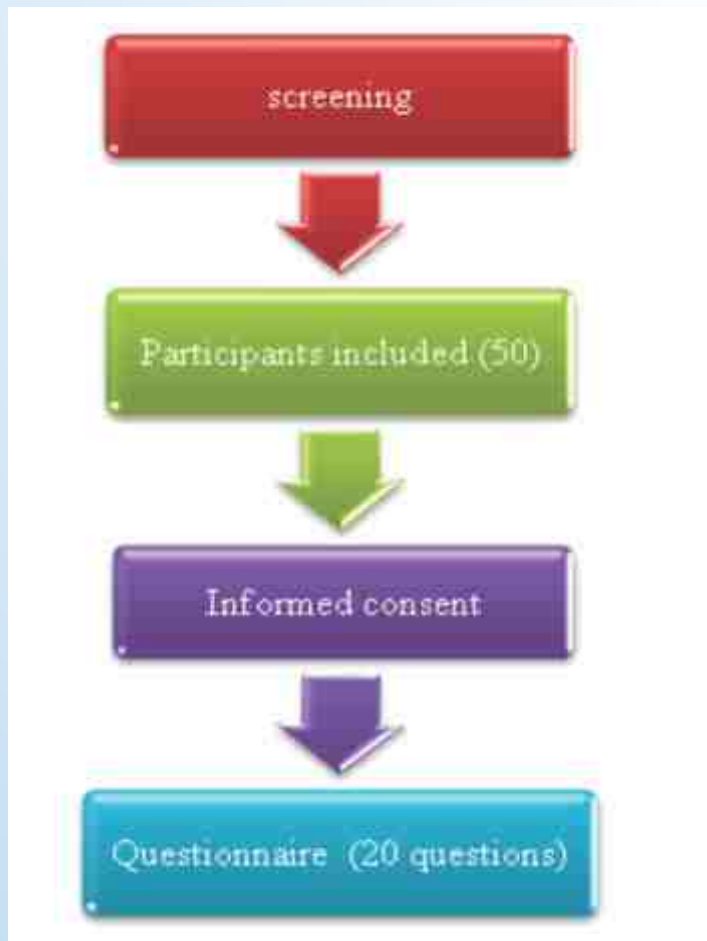
Methods : A total of fifty polio participants aged between 12yrs to 45yrs were selected in cross sectional study which based upon the inclusion and exclusion criteria. Participants were selected by convenient sampling technique and included those participants who agreed to participate in the study. Criteria's for inclusion were clinically diagnosed post-polio residual paralysis participants; participants who were prescribed with lower limb orthoses, both male and female were included. Participants were excluded if they had any other musculoskeletal, cardiac or chronic systemic diseases other than polio and mentally handicapped patients.

Outcome measure : The outcome measure used in this study was self-made questionnaire. Questions were referred from Physical rehabilitation book and questions were related to the participant's problem or any abnormal feeling after wearing the orthoses like- do you feel any pain, heaviness, cumbersome, itching problem or any cosmetic problem, any uncomfotability after wearing orthoses? Are you walking comfortably after wearing orthoses on an uneven surface? Questionnaire was filled by primary investigator and validation of questionnaire was done by experts in physiotherapy.

Procedure:-

The subjects were explained the purpose of the study in their local languages. After that the consent form was signed by them to voluntarily participate in the study. Questionnaire filled by patients their own language. The data was analyzed& interpreted to find conclusion of the study.

Flow Chart-

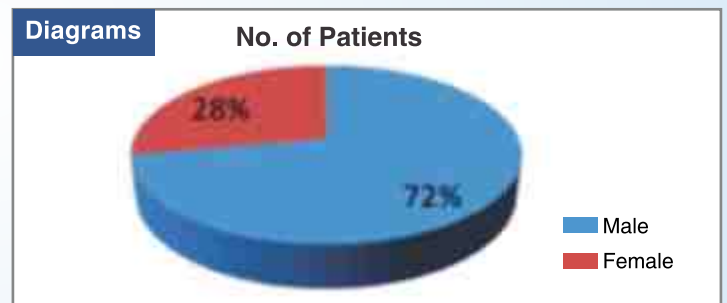


Results : The results of this study were analyzed in terms of lower limb orthosis is useful or not in PPRP patients. Statistical analysis was done by Graph pad instat software. Various statistical measure such a mean, standard deviation (SD) etc.

Demographics : A total fifty polio participants were screened for the study from January 2009 to November 2010 considering the inclusion and exclusion criteria. The mean age of the participants was 29.02 years and SD was 9.91. The gender ratio was 36 :14 (36 males and 14 females).PPRP patients 'p' valueAge (years)29.02±9.91Gender (M/F) 36 (72%)/14(28%)-

	PPRP patients	'p' value
Age (years)	29.02±9.91	
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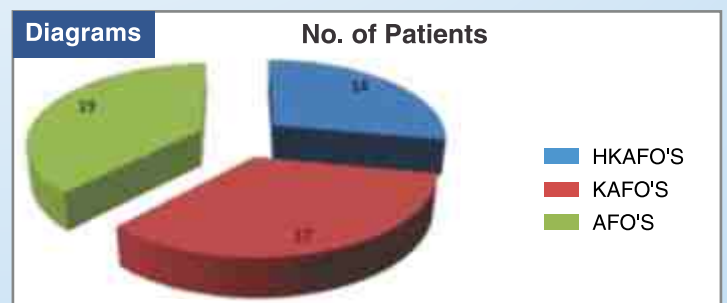
Table 1: Showing Demographic Profile.



Graph 1st shows no. of patients taken in this study are 50 out of which 36 (72%) males & 14(28%) females with their mean age.

Graph - II :- Distribution of patients according to HKAFO'S, KAFO'S AFO'S.

Orthosis	No. of patients(Percentage)
HKAFO'S	14
KAFO'S	17
AFO'S	19



Graph 2nd shows that 14 patients were prescribed with HKFO's, 17 patients were prescribed KAFO's & 19 patients were prescribed with AFO's.

Orthoses	Percentage (%)	
	Not Using	Using
HKAFO'S	85.71	14.29
KAFO'S	58.82	41.18
AFO'S	84.21	15.79

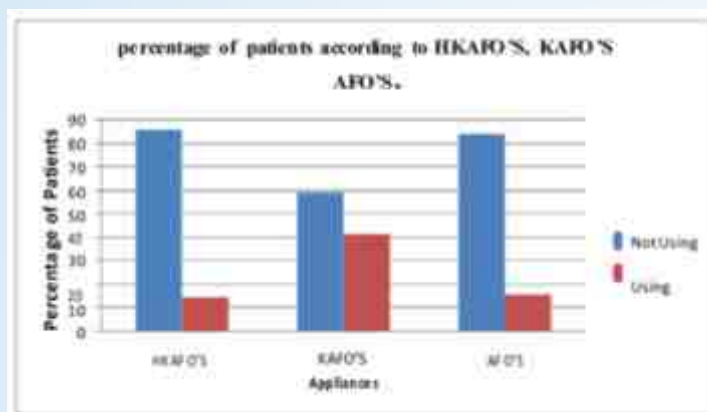
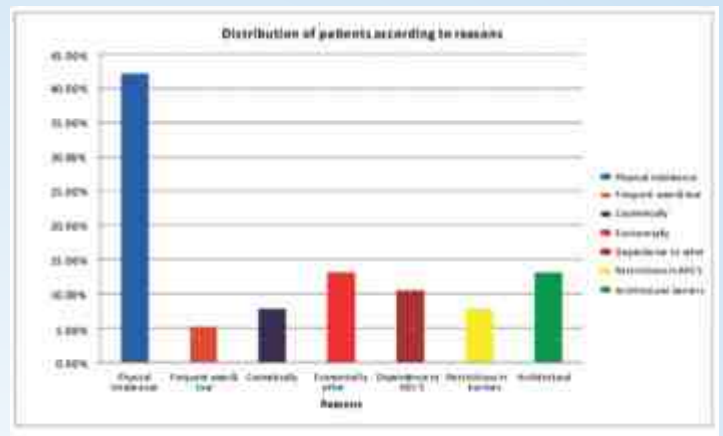


table 3rd shows percentage of HKAFO'S, KAFO'S, AFO'S; Out of 50 patients 14.29% (2) HKAFO's, 41.18% (7) KAFO's, 15.79% (3) AFO's were used & 85.71% (12) HKAFO's, 58.82%

(10) KAFO's, 84.21% (16) AFO's were rejected.

Graph IV- Showing distribution of patient's according to the reasons of rejection of orthoses

Orthosis	Percentage (No. Of patients)
Physical intolerance	42.10% (16)
Frequent wear & tear	5.26% (2)
Cosmetically	7.89% (3)
Economically	13.15% (5)
Dependence to other	10.52% (4)
Restrictions in ADL'S	7.89% (3)
Architectural barriers	13.15% (5)



Graph 4th shows distribution of patients according to the reasons of rejection of orthosis. Among those physical intolerance (42%) is the commonest reasons for rejection of orthosis.

Discussion : This study was carried out in Loni & neighboring villages. 50 participants were chosen out of which 36 were males & 14 were females. In spite of disadvantages of orthoses like physical intolerance, frequent wear & tear, cosmetically, economically, dependence to other, restrictions in ADL'S and architectural barriers etc. 24% of patients was found to be using lower limb orthoses and 76% rejected or discarded orthoses after using 6-7 months. Some patient's reported difficulties in walking on uneven surfaces or slopes or hills with lower limb orthoses. Discontinuation rate was higher in male's i.e.72% & in females it was 64%. In females it may be because of orthoses were not suitable for household activities where most of the work was done at the floor level.^[3,6] Presence of closed leather shoe & poor cosmesis could be other contributory factors for discontinuation in females. Physical intolerance (Pain, heaviness, fatigue, itching) was also a reason for discontinuation. Similar finding was also reported by Hariharan^[7] & Fisher^[3] that higher rejection among unilaterally involved cases due to the greater independence that these persons enjoy without the orthoses. Higher discontinuation among patients explained by a) lack of strength & co-ordination b) most of them ambulate without orthoses because of the unilateral involvement c) more association with social & religious activities where shoes are restricted^[8]. Association between discontinuation & educational level was significant in contrary to reports. However, discontinuation was

observed more among laborers, cultivators, housewives who need lots of activities at the ground level^[9,10,11]. Architectural barriers such as threshold in doorways, steps, staircases, high basement level of the traditional housing; uneven roads were present for all. Major problem was due to restriction of flexibility & loss of suppleness of foot imposed by the orthoses. Restriction of mobility of the locomotor disabled due to architectural barriers.

Few suggestions are made to minimize rejection: -

- 1) Prescription of orthoses should be done in an individualized approach keeping in view economic, social, cultural, religion, materials & resources, locally available form of technology^[12].
- 2) Proper exposure & training should be given for all medical officers involved in rehabilitation care services to avoid unnecessary & incomplete prescription, incomplete or wrong training methods, careless checkout etc.
- 3) Provision of locally available materials & technology should be given priority. Quality, function & cosmetics should never be compromised in the name of low cost appliances to avoid rejection.
- 4) Use of newer synthetic & lightweight materials, which are more acceptable to the patient both functionally & cosmetically, should be promoted^[13].

Conclusion : The discontinuation of lower limb orthoses was found higher in males (72%) than females (64%) & those who were using HKFO's (86%) followed by AFO's (84%). The most common reason for discontinuation of lower limb orthosis by Post Polio Residual Paralysis participants was physical intolerance (42%).

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