



A STUDY ON THE PARENTS' GRASPING POWER ABOUT THE KNOWLEDGE OF CHATBOT- AN AI ASSISTED TELEPHYSIOTHERAPY FOR THEIR CHILDREN WITH SPASTIC CEREBRAL PALSY

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Abstract : Physiotherapy management for children with cerebral palsy is a comprehensive task that requires regular, consistent intervention. Parents, residing in rural areas, often, face difficulty in bringing their children to hospital-based physiotherapy due to transport constraints and the physical limitations of the child, which may lead the parents to experience physical and mental stress. An AI assisted chatbot-based telephysiotherapy model was introduced to educate the parents and enable them to do home-based physiotherapy exercises. This descriptive study was conducted among 18 parents of the children with spastic cerebral palsy aged between 3 to 5 years, who were selected by convenience sampling the parents were given a one-week structured physiotherapy orientation session, following which they were instructed to use the AI assisted chatbot independently at home. After the intervention period, the parents' understanding was assessed using five closed ended (Yes/No) questions. The data were analysed using descriptive statistics and chi-square goodness of fit test. Among the 18 parents, 12 (66.7%) found the chatbot easy to use and 11 (61.1%) understood the exercise instructions clearly. However, 11 parents (61.1%) reported facing difficulty while performing exercises, 4 parents (22.2%) felt confident that they performed the exercises correctly and 14 (77.8%) lacked confidence ($\chi^2 = 5.56$, $p = 0.018$). Totally 8 parents (44.4%) were willing to continue using the chatbot regularly at home. It is concluded that the AI assisted chatbot may be used as a supportive educational tool but should be combined with periodic hands-on supervised training to the improve parents' practical competence and confidence.

IndexTerms - Cerebral palsy, AI assisted chatbot, Telephysiotherapy, Parents' understanding, Home-based physiotherapy.

I. INTRODUCTION

The children with cerebral palsy can undergo physiotherapy treatment which is very comprehensive. In recent times, the physiotherapeutic exercises have achieved excessive development in managing children with cerebral palsy including advanced physiotherapy techniques. It is understood that the physiotherapy service can be done in hospital and home. Since individual and specific focus is given to the children with cerebral palsy, such centre function worldwide. The above mentioned physiotherapy application criteria is hospital and home.^[1,3,4]

The parents of children with cerebral palsy face certain practical problems, namely the parents find it difficult to commute their children, to the hospital atmosphere. The parents residing in rural areas face this discomfort in shifting their children to hospital for physiotherapy. The accurate reason Children with cerebral palsy are affected by paralysis of arms and legs that leads to loss of movements and fundamental mobility of the children. This is the reason that the parents experience mental stress.^[2]

The purpose of the study is to educate the parents about therapeutic exercise with the help of AI assisted chatbot. With this method, the parents can help their children do the exercises daily at home. It helps the parents to avoid spending time at the physiotherapy in hospital.^[5,6,7]

1. Dose the therapy cause significant effect on the child? 2. Can the researcher know the parents gain the knowledge of AI assisted therapy? Several questions are raised in this study regarding the application of AI assisted physiotherapy on the children with cerebral palsy. The significance of this study lies in promoting reorganization and awareness about the application among the parents. With the assistance of video images, the parents receive the knowledge of physiotherapy regimen and create the AI assisted chatbot in the cell phone. The AI assisted chatbot has information about cerebral palsy and the relevant physiotherapy methods. [8,9]

One of the delimitations of this study that it does not gather information about understanding of AI assisted chatbot from the parents and the other is that it does not enquire applying the physical therapy daily. This study may produce effective results. This study will be done purely home-based atmosphere.

II. OBJECTIVE

To determine the parents' understanding of AI Assisted chatbot.

III. RESEARCH METHODOLOGY

3.1 Sample Design

The inclusion criteria of this study is that in selected the children with cerebral palsy aged between 3 and 5 years. The parents who were interested in participating in the study, were included and whose children were diagnosed with spastic type cerebral palsy. The exclusion criteria include parents who were not willing to use smartphone-based application, and children with cerebral palsy having associated co-morbid conditions such as uncontrolled seizure disorder or severe visual/hearing impairment which might interfere with the therapy regimen.

3.2 Study Design

Descriptive study.

3.3 Study Setting

The study was conducted among the parents of children with spastic cerebral palsy and attending the physiotherapy department, through home-based telephysiotherapy model.

3.4 Sample Size

Totally, 18 parents of the children with spastic cerebral palsy were included in this study following convenience sampling method.

3.5 Study Duration

The study was conducted over a period of one week.

3.6 Procedure

The parents of children with spastic cerebral palsy who fulfilled the inclusion criteria were selected for the study. An AI assisted chatbot was developed and provided to the parents through their smartphones. The chatbot contains detailed information regarding cerebral palsy and its physiotherapy management, along with video and image-based demonstration of therapeutic exercises. Before initiating the home-based training, the parents were given a structured one-week physiotherapy orientation session by the physiotherapist. Following this, the parents were instructed to use the AI assisted chatbot independently at home to continue the exercise regimen for their children. After the intervention period, the parents' understanding and experience regarding the chatbot-based telephysiotherapy was assessed using five closed-ended (Yes/No) questions.

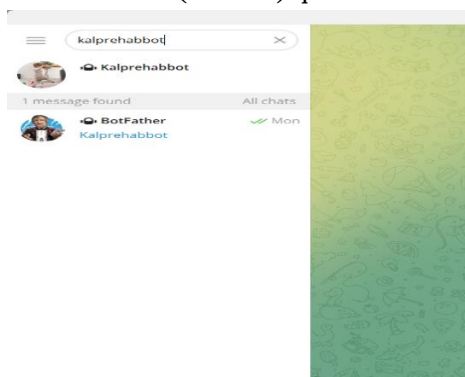


Fig.1: An chatbot named as kalprehabbot in telegram

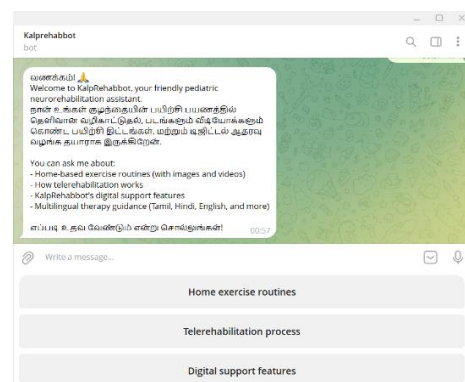


Fig.2: Parents used the chatbot which was available in all languages

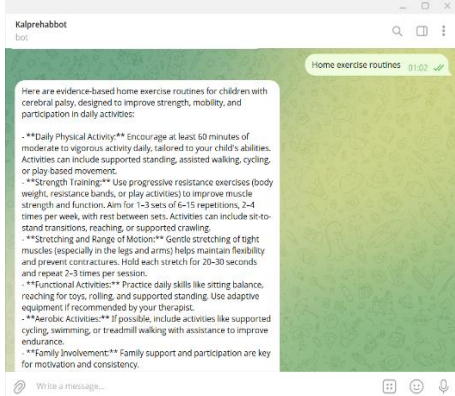


Fig.3:Instructions for home exercises

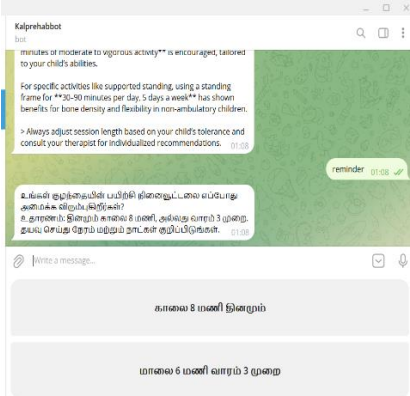


Fig.4:Reminder settings for exercise



Fig.5:Balance training explained in Hindi

3.7 Outcome Measure

A self-structured questionnaire, consisting of five closed-ended questions, was used to assess the parents' understanding, ease of use, clarity of instruction, confidence level and willingness to continue chatbot-based telephysiotherapy.

3.8 Statistical Analysis

The collected data were analyzed using descriptive statistics such as frequency and percentage. The Chi-square goodness of fit test was applied to determine whether the responses obtained significantly differed from the expected equal distribution (50:50). The p value of <0.05 was considered statistically significant.

IV. RESULTS

A total of 18 parents of children with cerebral palsy who received one week of telephysiotherapy training completed the chatbot-based follow-up assessment consisting of five closed-ended (Yes/No) questions. The responses are summarized below.

Regarding ease of use, 12 out of 18 parents (66.7%) reported that the chatbot was easy to use, and 6 (33.3%) found it difficult. Concerning comprehension of instructions, 11 parents (61.1%) stated that they were able to clearly understand the exercise instructions provided by the chatbot, whereas 7 (38.9%) reported lack of clarity.

When asked about whether they faced difficulty while performing the exercises with their child, 11 parents (61.1%) reported facing difficulty and 7 (38.9%) did not. This finding indicates that despite the chatbot being rated as relatively easy to use, a considerable proportion of parents still experienced practical challenges during hands-on exercise delivery.

With regard to confidence in performing the exercises correctly, 4 parents (22.2%) felt confident, and majority of 14 parents (77.8%) did not feel confident that they were performing the exercises correctly. This difference was statistically significant on chi-square goodness-of-fit testing ($\chi^2 = 5.56$, $p = 0.018$), suggesting that the low confidence level was unlikely to be due to chance alone.

Finally, when asked about whether they would like to continue using the chatbot regularly, at home, for their child's therapy, 8 parents (44.4%) responded positively, and 10 (55.6%) were unwilling to continue.

Table 1. Parent responses to chatbot-based telephysiotherapy questions (n=18)

S.No	Question	Yes n(%)	No n(%)	χ^2	p-value
1	Ease of use of chatbot	12 (66.7)	6 (33.3)	2.00	0.157
2	Clarity of exercise instructions	11 (61.1)	7 (38.9)	0.89	0.346
3	Difficulty faced during exercise	11 (61.1)	7 (38.9)	0.89	0.346
4	Confidence in correct performance	4 (22.2)	14 (77.8)	5.56	0.018*
5	Willingness to continue chatbot use	8 (44.4)	10 (55.6)	0.22	0.637

*Statistically significant at $p < 0.05$

Overall, while a majority of parents found the chatbot easy to navigate and the instructions reasonably clear, this did not consistently translate into confidence or difficulty-free execution of exercises, and less than half expressed willingness to continue chatbot-based therapy delivery at home.

V. DISCUSSION

The present study was conducted to determine the parents' understanding of AI assisted chatbot-based telephysiotherapy for their children with spastic cerebral palsy. The findings of this study revealed that majority of 12 parents out of 18 (66.7%), found the chatbot was easy to use and 11 parents (61.1%) were able to clearly understand the exercise instructions provided through the chatbot. This indicates that the AI assisted chatbot, with the help of video and image-based demonstration, was reasonably successful in delivering the physiotherapy-related knowledge to the parents in a home-based setting, which supports the purpose of this study, (i.e) to reduce the burden of hospital-based physiotherapy consumption.^[6,7]

However, an interesting finding of this study is that despite the chatbot being rated as easy to use and instructions being clear, 11 parents (61.1%) still reported facing difficulty while performing the exercises with their children. This discrepancy between comprehension of instructions and actual practical execution suggests that understanding a chatbot interface and translating that understanding into correct hands-on physical therapy technique with a spastic cerebral palsy child are two different skill domains. Handling a child with spasticity, positioning, and range of motion exercises require tactile guidance and real-time correction, which a chatbot, however, well designed, may not be able to fully substitute.

This is further supported by the finding that totally, 4 parents (22.2%) felt confident while performing the exercises correctly, and a majority of 14 parents (77.8%) lacked confidence, and this difference was found to be statistically significant ($\chi^2 = 5.56$, $p = 0.018$). The low confidence level among the parents, even after receiving a structured one-week orientation session, highlights the point that those hands-on supervised training and periodic follow-up may be necessary to reinforce the parents' skill and confidence, rather than a single training session followed by independent chatbot-guided practice.

In relation to the willingness to continue the chatbot use regularly at home, totally, 8, out of 18 (44.4%), expressed willingness to continue, and 10 parents (55.6%) were not willing to continue. This finding may be attributed to the low confidence level and the practical difficulty faced by the parents while performing the exercises, which, in turn, may have discouraged the continuous use of the chatbot-based method. This finding answers the first research question raised in this study, that the method has produced only partial effect, mainly in terms of knowledge delivery, but not adequate in terms of parents' confidence and long-term acceptance.

Regarding the second research question, whether the parents have obtained sufficient knowledge through the AI assisted chatbot, the results suggest a partial success, as majority of the parents understood the chatbot interface and instructions, but sufficient practical competence and confidence were not achieved. This finding is consistent with the fact that physiotherapy for children with cerebral palsy is a skill-based intervention that may require repeated hands-on practice, physiotherapist feedback, and gradual home-based skill transfer, rather than a one-time chatbot-based training model alone.

The findings of this study emphasize the pointing the AI assisted chatbot can serve as a useful supportive tool for improving the parents' theoretical understanding and reducing transport-related burden for rural and home-bound families, but it may not be sufficient as a standalone method for building practical competence and confidence among parents, particularly within a short duration of one week.^[1,3,4]

VI. CONCLUSION

From this study, it is concluded that the knowledge of chatbot - AI assisted telephysiotherapy-is useful for the parents. This method of telephysiotherapy has created interest on the parents and be reduce the burden of the physiotherapist in managing children with cerebral palsy. The demonstration of chatbot telephysiotherapy is much better than that of physical demonstration of exercises as home programme for the parents of children with cerebral palsy.

LIMITATION OF THE STUDY

The sample size of this study was small ($n=18$), which limits the generalization of the findings. The duration of the study was limited to one week, which may not be sufficient to assess the long-term retention of knowledge and skill among the parents. The study did not evaluate the direct outcome of the child's improvement, as it purely focused on the parents' understanding.

RECOMMENDATION

This study used a small size of samples and a clear picture of chatbot based telephysiotherapy may be seen with a large-size sample. The same study can be done in future with large number of samples and different variables.

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APPENDIX

1. Was it easy to use the chatbot? Yes/No
2. Were you able to clearly understand the exercise instructions given by the chatbot? Yes /No
3. Did you face any difficulty while doing the exercise with your child? Yes/No
4. Did you feel confident that you understood the exercise correctly? Yes/No
5. Would you like to continue using this chatbot regularly at home for your child's therapy? Yes/No

