

IMPLEMENTATION OF ICF-BASED ASSESSMENT AND TREATMENT COURSE FOR CHILDREN WITH CEREBRAL PALSY BY HEALTH PROFESSIONALS OF NEPAL: A CROSS-SECTIONAL STUDY

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ABSTRACT

The International Classification of Functioning, Disability and Health (ICF) provides a holistic framework for the assessment and management of cerebral palsy. Although ICF-based training was provided to Nepalese health professionals between 2016 and 2018, its implementation in clinical practice has not been evaluated. This study assessed the implementation of ICF-based practice among trained health professionals in Nepal and identified barriers, facilitators, and prerequisites for successful implementation. A cross-sectional survey was conducted from June 2020 - June 2021 using a pilot-tested, self-developed questionnaire based on normalisation process theory. The questionnaire assessed four domains: coherence, cognitive participation, collective action, and reflexive monitoring. Data were collected through Google Forms or direct administration. Of the 48 eligible health professionals, 32 responded (response rate: 66.7%). Most participants considered the ICF approach valuable, and 84.4% supported its integration into routine clinical practice. Family-centred care was identified as a major advantage over previous approaches. Most respondents believed ICF could be implemented with minor modifications. Time constraints were the most commonly reported barrier (24/32), with streamlined outcome measures and improved team workload distribution suggested as potential solutions. Overall, health professionals perceived the ICF framework as beneficial for multidisciplinary, standardized, and comprehensive care. Addressing organizational barriers and adapting implementation strategies may facilitate successful integration of ICF-based practice in Nepal.

KEYWORDS

Cerebral Palsy, Health professionals, ICF, Implementation, Nepal

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INTRODUCTION

Cerebral palsy (CP) is the most prevalent movement disorder in childhood.¹ It is a permanent disorder of movement and posture that causes activity limitations and is frequently associated with disturbances in sensation, perception, cognition, communication, and secondary musculoskeletal problems.² The global prevalence of CP is approximately 2 per 1,000 live births and is comparable across both developed and developing countries.^{3,4}

In developed countries, the assessment and management of CP are guided by the International Classification of Functioning, Disability and Health (ICF). The ICF framework has demonstrated benefits such as standardization of assessment and evaluation, facilitation of functional classification and communication, and provision of a comprehensive theoretical framework for rehabilitation.⁵ However, ICF-based rehabilitation approaches have not been widely adopted in developing countries, including Nepal.⁶

To promote the use of ICF in Nepal, Adelante Rehabilitation Centre, Valkenburg, the Netherlands, initiated the F.A.I.R. project in 2012. Through this project, health professionals working with children with CP in Nepal received training in ICF-based assessment and treatment.⁷ Despite this initiative, it remains unclear whether trained health professionals have integrated ICF principles into routine clinical practice and what barriers within rehabilitation settings may hinder its implementation.

Although the effectiveness of ICF-based practice has been well documented in developed countries, its feasibility in low-resource settings such as Nepal has not been sufficiently explored. Therefore, this study aimed to evaluate the implementation of ICF-based practice among trained health professionals in Nepal and to identify barriers, facilitators, and prerequisites for successful implementation.

MATERIALS AND METHODS

A cross-sectional study was conducted from June 2020 - June 2021, involving health professionals who had completed either the basic or both basic and advanced ICF-based assessment and treatment courses between 2016 and 2018. This study was approved by the National Health Research Council (Ref. No.: 339/2019) and Institutional Review Committee of Kathmandu University School of Medical

Sciences, Dhulikhel, Nepal (Ref. No.: 143/19). Eligibility required a minimum of six months to have elapsed since course completion. Health professionals were excluded if they had completed the course less than six months prior, were members of the research team, had discontinued clinical practice with children with cerebral palsy, were foreign professionals trained in Nepal, or had migrated abroad. A total of 53 eligible health professionals were contacted, of whom five participated in pilot testing and were excluded from the final analysis.

Data were collected from health professionals working across five rehabilitation centers in Nepal: Dhulikhel Hospital (Dhulikhel), Hospital and Rehabilitation Center for Disabled Children (Banepa), Self Help Group for Cerebral Palsy (Dhapakhel), Special Education Rehabilitation Center (Chapagaun), and Green Pasture Hospital (Rambazar, Pokhara).

Development of questionnaire

Stage I: Questionnaire development: A semi-structured questionnaire titled “Implementation of ICF-Based Assessment and Treatment Course Questionnaire” was developed based on the core constructs of normalization process theory (NPT), which demonstrates good internal consistency (Cronbach’s alpha = 0.89) and acceptable face and construct validity.^{8,9} The questionnaire was designed to explore the implementation of ICF-based practice among health professionals and comprised four NPT domains.

The coherence domain (8 items) assessed participants’ understanding of the ICF-based course and their ability to differentiate it from previous practices. Cognitive participation (6 items) examined engagement, commitment, and motivation to adopt and sustain the practice. Collective action (6 items) evaluated how participants operationalized the ICF framework in daily clinical practice, including organization and allocation of activities. Reflexive monitoring (12 items) focused on participants’ appraisal of the ICF-based course, perceived outcomes, and changes in practice over time.

The questionnaire was developed collaboratively by primary investigator and team, who have been conducting ICF-based training programs in Nepal since 2016, in conjunction with the co-researchers of this implementation study. The development process was carried out under the supervision of the developer of the ICF-based assessment and treatment program for children with cerebral palsy in Nepal.

Stage II: Pre-testing: The questionnaire was pre-tested among five health professionals participating in the FITCare program at Dhulikhel Hospital who met the study's inclusion criteria. Feedback obtained from the pre-test participants and supervisory review was incorporated to refine the questionnaire. These participants were excluded from the main study.

Stage III: Evaluation of Implementation: A list of health professionals who completed the ICF-based training between 2016 and 2018 was obtained. After applying the exclusion criteria, the finalized questionnaire was distributed electronically via Google Forms to participants with available contact information (email or phone number). The questionnaire included an information sheet detailing the study's background, objectives, procedures, and voluntary nature of participation, with informed consent obtained prior to response submission. Participants were informed of their right to withdraw at any time. Reminder emails or phone calls were sent up to three

times at one-month intervals to maximize response rates.

Collected data were entered into the SPSS-25, and verified for accuracy. Sociodemographic characteristics and questionnaire responses were analyzed using descriptive statistics.

RESULTS

Health professionals participation in this study was 66.67% (32/48) excluding 5 Health professionals selected for pilot testing. The demographic characteristics of the participants are outlined in Table 1.

Among the participants, 23 had completed only the basic ICF-based course, while 9 had completed both basic and advanced courses. Most participants followed institution-specific assessment protocols, although some reported the absence of a standardized protocol. Only a few participants reported using treatment approaches such as Rood's method,

Table 1: Participants demographic characteristics (n=32)

Demographics	Frequency	Demographics	Frequency
Age (years)	n (%)	Practice years	n (%)
20-30	15 (46.9)	Less than 1 year	2 (6.3)
31-40	12 (37.5)	1-5 years	15 (46.9)
41-50	4 (12.5)	5-10 years	9 (28.1)
51-60	1 (3.1)	More than 10 years	6 (18.7)
Gender	n (%)	Speciality	n (%)
Male	8 (25)	Cerebral Palsy	15 (46.9)
Female	24 (75)	Others	17 (53.1)
Address		Education Level	
Kathmandu	10	Masters	4
Lalitpur	4	Bachelor	16
Bhaktapur	8	Diploma	5
Kavre	3	Training in specific course	7
Pokhara	6		
Others	1		
Workplace		Occupation	n (%)
SGCP	5	Physiotherapist	19 (59.3)
HRDC	6	Field facilitator	3 (9.3)
KUSMS	1	Physio-technician	2 (6.3)
Sathi Sansar Nepal	3	Home visitors	2 (6.3)
Neuro Hospital	2	Ass. Physiotherapist	2 (6.3)
SERC	2	Nurse	2 (6.3)
IFCH	1	Social mobilizer	1 (3.1)
NDF	1	Program manager	1 (3.1)
Others	13		

Table 2: Outcome measures mostly used

Outcome measure	Implemented in their practice (n)
Gross Motor Function Classification System (GMFCS)	26
Eating and Drinking Ability Classification system (EDACS)	13
Canadian Occupational Performance Measures (COPM)	21
Specific, Measurable, Relevant and Time (SMART Goal)	22
Goal Attainment Scale (GAS Goal)	9
Manual Ability Classification System (MACS)	19
Communication Function Classification System (CFCS)	18
Gross Motor Function Measure (GMFM)	16
None	5

Table 3: Normalization process theory frequencies of agreement (n=32)

Items	Yes n (%)	No n (%)
Sense making (coherence)		
I practice ICF module for assessment and treatment	23 (71.9)	9 (28.1)
This course is different from what I have practiced before	20 (62.5)	12 (37.5)
The course was able to meet its objectives	32 (100.0)	0 (0.0)
There is coherence between the course and goals of rehabilitation	32 (100.0)	0 (0.0)
Cognitive participation		
It's a good idea to use this treatment method	32 (100.0)	0 (0.0)
This ICF-module should be part of my daily work	27 (84.4)	5 (15.6)
I am willing to invest my time and energy to use this module	27 (84.4)	5 (15.6)
I will continue to support this course in further days	32 (100.0)	0 (0.0)
Collective action		
More training is required in order to apply this in practice	16 (50.0)	16 (50.0)
This module is compatible with existing work practice	13 (40.6)	19 (59.4)
There are sufficient resources and support to support this module	14 (43.8)	18 (56.2)
Reflexive monitoring		
I like to use this module further in your daily practice	26 (81.3)	6 (18.8)

Neurodevelopmental treatment (NDT), and functional therapy, while five reported using interventions including constraint-induced movement therapy (CIMT), bimanual intensive therapy (BIMT), and goal-oriented therapy. The Gross Motor Function Classification System (GMFCS) was the most frequently used outcome measure, followed by SMART goals (Table 2).

Implementation of ICF-based module for assessment and treatment of CP

As shown in Table 3, 71.9% of participants reported using the ICF module for children with CP, and approximately three-fifths perceived it as different from their previous practice. All participants agreed that the course aligned with rehabilitation goals. While all respondents expressed support for the future use of the ICF-

based course, 84.4% reported willingness to invest the required time and effort. Regarding collective action, 40.6% found the module compatible with their current work, although nearly 90.0% believed it could be integrated into practice with appropriate modifications. In terms of reflexive monitoring, 81.3% indicated a willingness to continue using the ICF module in daily practice.

A) Understanding ICF-based module: sense making (Coherence)

Although health professionals expressed varied interpretations of the ICF course, the majority (75.0%) described it as a structured framework for exploring functioning and disability (Fig. 1). Additionally, 72.0% of participants reported that the ICF course benefited multidisciplinary

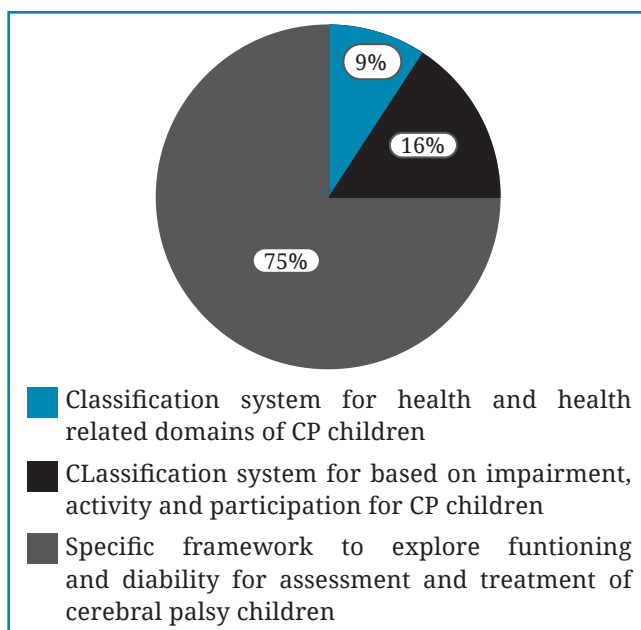


Fig. 1: Meaning of ICF based course

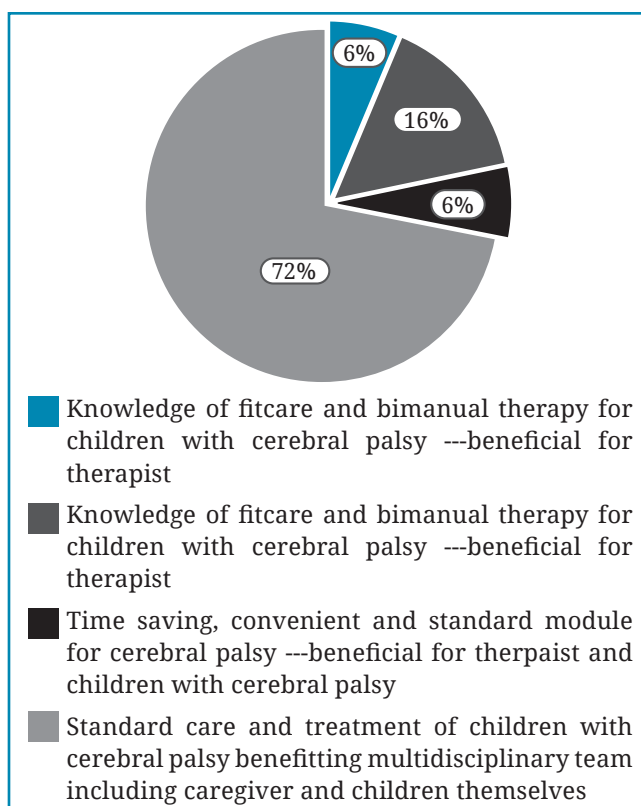


Fig. 2: Benefits and benefited groups

team practice by promoting standardized care for children with cerebral palsy (Fig. 2).

B) Engaging with ICF-based module: participation (Cognitive participation)

Regarding engagement with the ICF module, 53.1% of participants reported being able to allocate 30 minutes to 1 hour for its application, while 40.6% could allocate less than 30 minutes, and only 6.3% reported availability of more

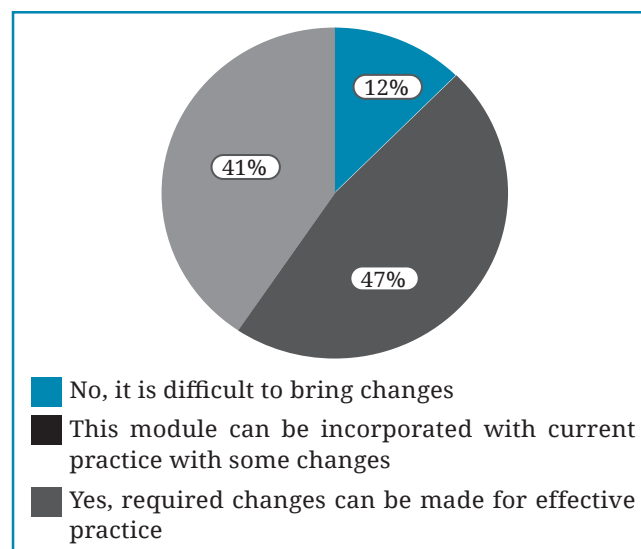


Fig. 3: Changes for effective practice

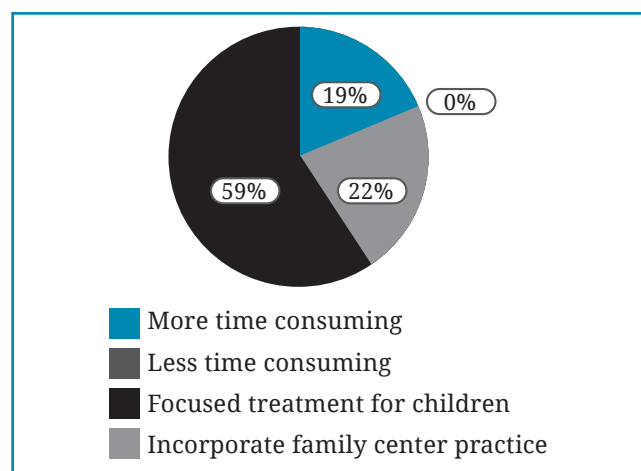


Fig. 4: Effect of ICF module on work

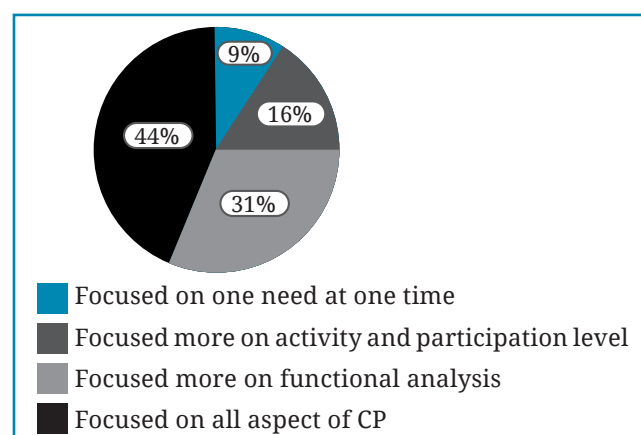


Fig. 5: Effect of ICF module on treatment

than 3 hours. The majority of respondents (88%) believed that effective incorporation of the ICF module into current practice would be feasible with appropriate modifications (Fig. 3).

C) Organizing change and relationships: enacting work (Collective action)

Collective action, which examines the practical

implementation of the ICF module, revealed that 59.0% of participants incorporated family-centered practices as a result of using the module (Fig. 4 and 5). Except for five participants who had not applied the module, the majority reported that it enhanced their work. Half of the participants felt they required additional training, while the other half did not. Approximately 56.2% reported insufficient resources and managerial support.

Furthermore, 59.4% considered the module incompatible with existing work practices, citing time constraints as the primary barrier, followed by high caseloads, limited staffing, and funding limitations.

Time constraints were the primary barrier for most participants (22/32), followed by limited availability of physiotherapists and caregivers, challenges in organizing

Table 4: Benefits and differences perceived from the course

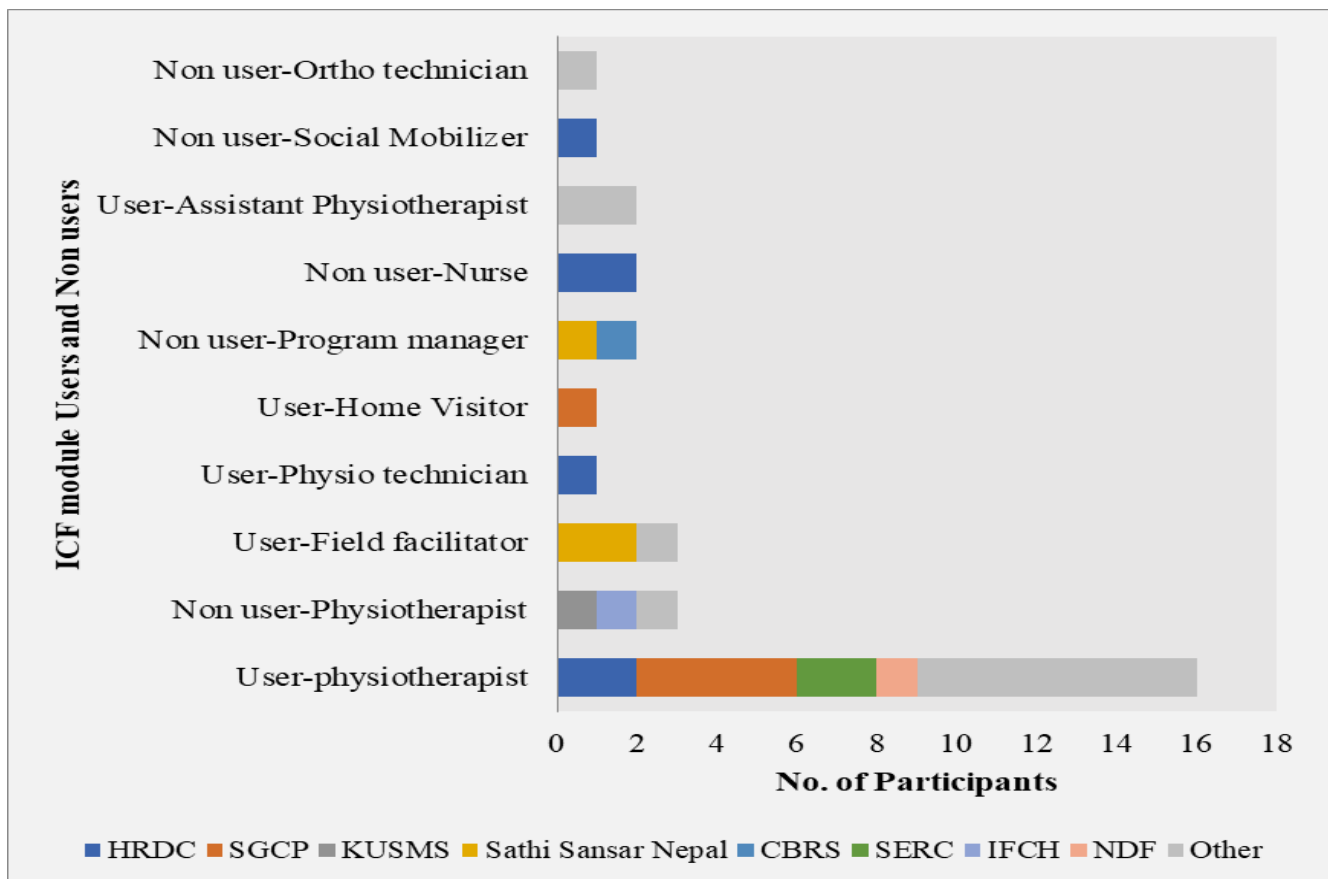
Items	n/ Total n (%)
Difference seen in practice of health professionals	
Give more time for one individual children	4/32 (12.5)
Implementation of ICF module for assessment and treatment	15/32 (46.9)
Implementation of FITcare and bimanual therapy for CP	9/32 (28.1)
No difference	4/32 (12.5)
Benefits resulted in practice	
Application of ICF based assessment for CP children	13/32 (40.6)
Application of goal-oriented assessment and treatment approach	10/32 (31.3)
Application of family centre practice approach	7/32 (21.9)
Application of new evidence bases treatment for CP	7/32 (21.9)
Difference perceived by patients and caregiver	
Active involvement of their children	20/32 (62.4)
More intensive and time consuming for caregiver	6/32 (18.8)
Address only need based on activity of daily life	6/32 (18.8)
Recreation routine than other treatment method	0/32 (0.0)

Table 5: Barriers, causes and solution for implementation

Items	n / Total n (%)
Barriers or Problems Perceived	
Time Limitation	22/32 (68.75)
Availability of physiotherapist and caregiver	11/32 (34.37)
Difficulty Organizing camp and infrastructural barriers	10/32 (31.35)
Financial issue	7/32 (21.87)
Associated causes for barriers	
Needed longer duration to assess outcome measure	20/32 (62.50)
Many job responsibilities of physiotherapist	16/32 (50.0)
Difficulty getting funds	10/32 (31.35)
Less cooperation from organization	6/32 (18.75)
Solutions	
Use of one outcome measure at one time	21/32 (65.62)
Work distribution among the physiotherapist	12/32 (37.5)
Applying grants	8/32 (25.0)
Involvement of director from different organization	6/32 (18.75)

Table 6: Suggested improvement to implement ICF-based course for CP

Items	n / Total n (%)
In terms of duration of course	
4-6 days course	15/32 (46.9)
6-8 days course	9/32 (28.1)
8-10 days course	3/32 (9.4)
More than 10 days course	5/32 (15.6)
In terms of method of teaching	
Role play	26/32 (81.3)
Focused group discussion	25/32 (78.1)
Video demonstration	24/32 (75.0)
Case based learning	20/32 (62.5)
Lecture	18/32 (56.3)
In terms of content	
More practical content than theory	13/32 (40.6)
More theory than practical content	0/32 (0.0)
Practical and theory content both equally	19/32 (59.4)
For Improvisation	
Pre and post test evaluation of the participants	12/32 (37.4)
Course conduction in Nepali language	10/32 (31.3)
Incorporation of other treatment approach as well	10/32 (31.3)
Minimize treatment duration for only 1 week	0/32 (0.0)

**Fig. 11: ICF module users and non users based on workplace and occupation**

camp, and financial constraints (Table 5). Suggested strategies to address these barriers included using one outcome measure at a time (61.6%), redistributing workload among physiotherapists (37.5%), securing grants (25.0%), and involving organizational directors from the outset (18.8%)

D) Monitoring ICF-based module: appraisal work (reflexive monitoring)

Reflexive monitoring, essential for sustaining new clinical practices, highlighted participant perceived benefits, differences from previous approaches, and caregiver perspectives, as summarized in Table 4.

As shown in Table 6, 46.9% of participants recommended a 4–6 day course. Role play was the preferred teaching method, followed by focused group discussion and video demonstrations, with lectures least favored. Over half preferred an equal balance of theory and practical content. Additionally, 37.5% suggested pre- and post-course evaluations, while 31.3% recommended offering the course in Nepali and another 31.3% suggested incorporating additional treatment approaches to improve the course.

Among respondents, nurses, social mobilizers, orthopaedic technicians, and program managers had not applied the ICF module, whereas physiotherapists in rehabilitation settings reported regular use in daily practice (Fig. 11).

DISCUSSION

ICF-based assessment and treatment for children with cerebral palsy (CP) has demonstrated effectiveness in high-income countries; however, its applicability in low-resource settings such as Nepal is less certain. Successful implementation requires health professionals to understand the cultural and familial context of their patients¹⁰ and introducing new clinical frameworks in healthcare settings can be challenging.¹¹ This study explored the implementation, perceptions, and barriers associated with ICF-based practice among health professionals in Nepal.

Most participants - primarily physiotherapists, assistant physiotherapists and field facilitators - reported using the ICF module and viewed it as a structured framework beneficial for multidisciplinary care. This aligns with previous evidence that ICF core sets support standardized assessment and treatment

while allowing for individualized care.^{5,12} In contrast, nurses, program managers, and physiotherapists in acute care settings reported limited use, likely due to fewer encounters with CP children or limited familiarity with the ICF framework, consistent with prior literature on nursing applicability.^{13–15}

Participants generally supported the integration of the ICF module into routine practice and recognized its benefits in promoting family-centered care, functional assessment, and multidisciplinary collaboration. Training in outcome measures such as GMFM, COPM, and GAS enabled participants to address multiple ICF components, reflecting evidence that no single measure fully captures ICF-CY domains and that combining measures enhances clinical utility.¹⁷ Despite these benefits, more than half of respondents reported that the module was still incompatible with routine practice due to insufficient resources, lack of managerial support, and workforce limitations. Nepal's physiotherapist-to-population ratio remains low, contributing to time constraints and high workload, which mirrors challenges reported in other low-resource settings.^{18–20}

Time limitations, limited availability of physiotherapists and caregivers, and organizational constraints were identified as major barriers, while suggested solutions included using one outcome measure at a time, redistributing workload, pre- and post-course evaluation, and securing managerial support. Participants also recommended improving training by using role play, focused group discussions, balancing theory and practical content, delivering the course in Nepali, and incorporating additional treatment approaches.

Overall, the study highlights that ICF-based modules can enhance rehabilitation practice in Nepal by promoting standardized, multidisciplinary, and family-centered care. However, successful implementation requires addressing structural, educational, and resource-related barriers. Larger studies, qualitative exploration, and evaluation of caregiver perspectives are recommended to optimize training and implementation strategies.

Health professionals, particularly physiotherapists, demonstrated a positive attitude toward ICF-based assessment and treatment for children with cerebral palsy, noting benefits for family-centered care and functional analysis.

Time constraints, driven by limited workforce and prolonged outcome assessment, were the main barriers to implementation. Strategies such as pre- and post-course evaluation, Nepali-language instruction, and workload redistribution may enhance feasibility and effectiveness of the course.

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