

# Exploring the contributing factors that influence the volition of adolescents with cerebral palsy: A directed content analysis

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## ABSTRACT

**Background:** Communication, behavioural disturbances and low motivation influence the functional potential and the effectiveness of interventions in adolescents with cerebral palsy (CP). While the model of human occupation (MOHO) is a conceptual model in occupational therapy, no research on the volition of adolescents with CP in daily activities has been undertaken. **Aim:** To explore the elements contributing to the volition of adolescents with CP based on their own experience. **Methods:** A qualitative approach using directed content analysis with volition of MOHO as a framework was applied. Semi-structured in-depth interviews were carried out with five adolescents with CP and five parents of the same adolescents. **Results:** In this study primary codes were categorized into eight categories: family and community-related values, individual values, individual perceptions of ability level, sense of control over conditions, enjoying performing activities, enjoying interpersonal relationships, physical context features and social context features. **Conclusions:** Personal causation in interaction with environmental features is strongly influenced by adolescents' motivation. **Significance:** Occupational therapists could improve the motivation of adolescents with CP in interaction with the individual's volition with focussing on self-efficacy for promoting personal causation. Adapting to the physical environment and changing the attitudes of others to these adolescents is necessary.

**Keywords:** Model of human occupation ; environment ; value ; interest ; personal causation ; motivation ; qualitative research ; occupational therapy

## Introduction

Cerebral palsy (CP), a permanent disorder of the development of movement and posture, which causes limitations in activity, is often accompanied by disturbances of sensation, perception, cognition, communication and behaviour [1]. CP is the most common physical disability of childhood, with a worldwide prevalence of 2.11 per 1000 live births [2], with the same ratio as in Iran [3]. Motivation is the most influential personal characteristic that determines motor and functional outcomes in children with CP, as reported by parents and clinicians [4,5] while its absence can impose limitations that prevent children from reaching their functional capacity [6]. A person's motivation to engage in occupations to give his or her life meaning is influenced by values, beliefs and spirituality [7]. Developmental changes during adolescence also include structural and functional changes in the neural systems involved in cognitive, emo-

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tional, social and motivational processes [8–10]. Levels of habitual physical activities significantly reduce in adolescents with CP compared with their normal peers [11]. According to Majnemer et al. [12], motivation may influence the process of intervention and outcome of therapy. Intrinsic motivation, as a type of motivation based on people's natural interest in various activities, provides novelty and challenge [13], which requires exertion in a child's motor performance and, more globally, their participation in leisure and other everyday activities [14].

In an occupational therapy context, the model of human occupation (MOHO) explains volition as the motivation for occupation [15]. Within MOHO, two aspects of motivation are explored: intrinsic motivation or volition, and extrinsic motivation or the environment. Volition consists of personal causation, values and interests. Personal causation alludes to one's sense of capacity and effectiveness, values refer to what one finds important and meaningful to do and, finally, interests point to what one finds enjoyable or satisfying to do. The environment, a critical part of the model, includes objects, spaces, occupational forms and social, cultural and political demands. MOHO asserts that the interaction between the person and the environment strongly influences occupational performance [15].

In previous studies, there has been no research about volition based on MOHO. However, there is a similar concept to personal causation as self-efficacy, which is believed to be the person's ability to produce the desired effects or the desired outcomes [15,16]. Furthermore, in young adults with a disability, including CP, participation is associated with the self-efficacy [17]. According to MOHO, the concept of occupational participation is referred to as 'engagement in work, play, or activities of daily living that are part of one's sociocultural context and are desired and/or necessary to one's wellbeing' [15]. Schwartz [18] presented a value theory identifying ten basic values that are derived from the universal requirements of human existence. A similar concept to value is 'self-concept', which is 'a psychological construct formed through interpersonal experiences in social contexts and is influenced by genetic endowment and the expectations as well as judgements of significant others (i.e. parents, siblings and peers)' [19]. Motor abnormalities, accompanying impairments and anatomic distribution in individuals with CP [1] exert influence over their self-concept [20]. Among studies that have examined self-concept in individuals with CP in comparison to children developing normally, several reported lower self-concept in children with CP [20–22], one reported no difference [23], and one reported higher self-concept [24]. Slot et al. [25] reported that adolescent's daily life included a diverse range of parallel interests bound strongly to a social context. Moreover, physical and social environments, as supportive and limiting factors, influence adolescents with CP from participating in daily life [26,27].

MOHO is the most developed model in terms of providing practical resources [28], because of the positive impacts of utilizing models in everyday practice, professional identity and its role in increasing the sense of confidence as an occupational therapist [29]. Thus a further understanding of the application of MOHO in relation to the volition of adolescents with CP in the socio-economic context of Iran seems to be necessary. Iran is categorized among the low and middle-income countries, with a population of about 80 million, of which 11 million are between 10 and 19 years old [30]. As cultural and contextual issues, in both Iranian national culture and in the religious beliefs of most Iranians, family is deeply rooted [31]. It is widely considered as the most important and basic social unit and where children play a central role. As a result, it is expected that many interpersonal and psychological problems, including children's mental health problems, to be dealt with at home and especially by the family members [32]. Moreover, the authors hope that the families and therapists of these adolescents would use the results of this study to promote motivation among these adolescents in everyday practice. This study aims to explore which elements contribute to the volition of adolescents with CP according to their experience. To the best of our knowledge, no research on volition in these adolescents has been conducted.

## Material and methods

A qualitative approach with using directed content analysis was chosen [33] while categorization was done using predetermined themes concerning volition from MOHO [15].

### Participants

Purposeful with maximum variation sampling was adopted [34,35]: as presented in Table 1, five adolescents with CP, 10–19 years old [36–38], a Gross Motor Function Classification System (GMFCS) level I–III [39,40], and five parents (four mothers and one father of the same adolescents) participated in the study. Two adolescents and their mothers were selected from two private occupational therapy clinics and two adolescents and their mothers were in-

troduced by colleagues. In addition, one adolescent and her father were selected from a high school. To participate, participants had to be willing and ready to participate as well as having the ability to communicate effectively with the interviewer so as to share their experiences of volition.

Table 1. Characteristics of participants.

Subject	Gender	Age (years)	Role	Education
P1	Female	18	Adolescent	Diploma
P2	Female	40	Mother of P1	Bachelor
P3	Female	14	Adolescent	High school student
P4	Female	48	Mother of P3	Diploma
P5	Male	17	Adolescent	High school student
P6	Female	46	Mother of P5	Diploma
P7	Female	15	Adolescent	High school student
P8	Male	45	Father of P7	Bachelor
P9	Male	12	Adolescent	High school student
P10	Female	39	Mother of P9	Diploma

## Procedure and data collection

Following ethical approval from the Iran University of Medical Sciences Ethics Committee, potential participants' parents were contacted by phone. After receiving a brief explanation of the study and providing oral consent, participants that met the inclusion criteria were invited to participate in the study after both parents and adolescents signed an informed consent. Five adolescents with CP and their parents were interviewed via a semi-structured in-depth interview methodology in which they chose where the interview to be conducted: in the occupational therapy department, the clinic, or in their own home. The interviews lasted 20–35 min. Until the saturation point was reached, interviewing for further information continued [41]. Examples of the questions were 'What are important issues to you?', 'What are you interested in and what do you enjoy doing?' and 'Do you think you have the ability to do the things you like?' To encourage the participants to talk and provide more detailed information, follow-up questions were used, such as 'It is what you do?' 'What prevents you from doing things?' and 'What facilitates them?'

## Data analysis

According to the MOHO, volition consists of three subcomponents as values, interests and personal causation [15] that directed the coding of the gathered data. After recording and transcribing the data verbatim, all interviews were reviewed, coded and immediately analysed by the interviewer [42]. According to the directed content analysis process [33], each interview was initially read carefully several times to acquire a deep understanding of the data. Later, significant statements were highlighted to identify the initial codes or meaning units existing in the interview text. After that, these similar meaning units (codes) were first categorized into three main themes associated with volition. Data that could not be coded were identified and analysed to provide a new theme or a category of existing code. Interviews were continued to the point where no new data could be gathered and saturation was attained [41].

## Ethical considerations

The participants signed the consent form prior to the interview and were notified formally of the study purpose. Since the participation was voluntary, they could withdraw whenever they wanted without any consequences. Interviews were conducted in places selected by the interviewees. The study was approved by the Iran University of Medical Sciences Ethics Committee on 24 June 2018 (ethics approval number IR.IUMS.REC.1397.048).

## Trustworthiness

To confirm credibility, prolonged engagement in the field helped to establish trust and rapport with participants, which provided an opportunity to assemble the data. To ensure that the analysis would reveal the participants' volition in exploring during the data collection, the process of checking with participants was conducted, and the necessary changes were made. To confirm the dependability and conformability of the data, the initial codes, subcategories, categories and themes of volition were audited by experts; the external check method was adopted using the author's expertise and familiarity with MOHO. Moreover, to ensure that the initial codes, subcategories, categories and themes of volition were robust, a focus group was formed with ten occupational therapists' who had a level of clinical experience with adolescents with CP for more than 10 years. Convenience sampling was applied to select participants with this level of experience regardless of the geographic area and place of work. The conformability and credibility of the data were confirmed by maximum variation in sampling. For a maximum variation to occur with a vast range of views and perspectives, sampling strategies were adopted [43].

## Result

In this study of volition in the context of Iranian adolescents with CP, 403 codes were classified under four themes, eight categories and 19 subcategories. The results are presented in Table 2, with excerpts of participants' quotes in the text along with the description of the themes.

Table 2. Identified themes.

	Theme	Category	Subcategory
Predetermined themes: volition of MOHO	Values	Family and community-related values	Having a social relationship
			Receiving attention
			The tendency to be consistent
			Obligation to others
		Individual values	Acquisition independency
			Believing in disability
			Looking ahead
			Religious beliefs
	Personal causation	Individual perception of ability level	Feeling ability in performing occupations
			Feeling limited ability in performing occupations
		Sense of control over conditions	Individual determination
			Control the emotions
	Interest	Enjoying performing activities	Enjoying the media
Enjoying performing soothing activities			
Enjoying performing happy and energetic activities			
Performing activities within the ability range			
Enjoying interpersonal relationships			

	Theme	Category	Subcategory
The new theme	Environmental feature	Physical context features	
		Social context features	Supportive community
			Limiting community
		Controlling family	

## Values

Their family and community-related values contained information about having a social relationship, receiving attention, the tendency to be consistent and obligations to others.

Not to upset others, these adolescents tried to be kind and create a social bond with them. Considering these values, it was of prime importance for them to make friends and communicate appropriately with others. Moreover, they wanted their abilities to be perceived, and desired to receive material and verbal rewards, while trying to avoid being mocked because of their physical disabilities. It was highly valued by them to accomplish their goals, and show self-ability to be the same as others and at the same level as others. They strove constantly to attend a better school and to acquire higher degrees in science and in position. When they attended a ceremony with their friends, it was important for them not to require help from anyone to deal with the environmental obstacles, when they attempted to do this independently. The important behaviour for them was not to be underestimated by their friends, even in sports activities. Furthermore, several of them valued studying as one of self-obligation while other adolescent participants studied because of their family and friends' pressure.

One adolescent's mother expressed her experience of her son's most important value:

For example, if a person ridicules or annoys him, he gets very upset... it is very important for him to be treated kindly... when a person looks kindly at him, he is very happy and is attracted to him. (p. 10)

One adolescent expressed his values as follows:

It is very important for me to prove this is not what you and people think about me, whether in terms of lessons, behaviour, or career... no matter what it is. (p. 1)

Individual values contained information about acquisition of independence, believing in disability, looking forward and religious beliefs.

Some of the adolescents with CP were dependent on others for performing their occupations, which in some cases, were interpreted as inter-dependence between mothers and children. However, becoming independent in all aspects of occupation was important for them which created a strong tendency to make efforts to achieve independence. The main causes of dependence were lack of motivation to live, believing that their physical disability was not improving, and believing in disability. As a result, these factors precipitated unwillingness in carrying out their activities, feelings of frustration leading to depression, and even beliefs in not having a good job in the future. Unlike these adolescents, some were looking ahead with long-term goals who attended a favourite university course.

One mother's expressed her experience of her daughter's dependency as follows:

My daughter depends on me because of her physical condition... because I thought she needed support, I was always with her... because of this, the dependency created between us is too deep... and my attempts fail as I get her away from me to enter the community. (p. 2)

Furthermore, they imbued religious activities with the belief that God would heal them.

## Personal causation

This theme included two subcategories: individual perceptions of ability level and sense of control over conditions.

Some of the participants had a strong belief that they could perform different occupations, such as managing home, helping their mothers in household chores and performing physically demanding occupations. Others thought that they were not able to perform their occupations well, nor have the skill and time to carry out their activities owing to their physical disabilities. Some of the adolescents with CP found themselves able to act as 'normal' people,

thus they assisted their mothers in household chores, as well as their fathers in their work. Despite physical disabilities, they were independent in terms of self-care. For instance they went to the toilet while resting their bodies on the wall and grabbing the handrail. These adolescents had a strong belief that they could achieve steady progress in their studies, improve physical disability and obtain their favourite job.

One adolescent as the reply to the question 'if he believes he can accomplish whatever he wishes' mentioned that:

Yes, just when I want to go to the toilet, I have to lean against the wall and sit down... now, thank God, I can walk and I'm fine.... for example, when I can ride a bike, I can go home, to a shop or to the park. (p 9)

Feelings of having limited ability in performing activities emerge in different forms. Some of these participants showed strong resistance to entering unfamiliar environments and did not go to parties with unfamiliar guests. These adolescents were not eager to learn new activities owing to having to reveal a personal disability, not willing to show themselves as a disabled person in learning new activities. They accepted themselves as the ones incapable of performing various activities due to their physical disability and its complications, and remarked that they would lose their balance in sports activities, have muscle weaknesses, and be slow in movement. Owing to their physical disability, they could not establish a friendly relationship with others, or even converse with others in the community.

One participant who had feelings of limited ability noted:

Everyone in the school is able to walk and use their own hands well... they can exercise, but I can't... whenever I want to exercise, the sports instructor says that you can't use your hands and feet correctly... when they say this, I think I can't. (p 7)

These adolescents were controlling their feelings over many conditions. They hid their distress from others, especially their families, and felt that they could be psychologically strong; accordingly, they tried to resolve the conditions causing these feelings.

One adolescent asserted how she controlled her sense in different conditions:

I'm saddened by the glance of my friends... many times, I did not say to my mother that it hurts me. I've always tried to solve this problem myself. (p 1)

## **Interest**

Their interests included enjoying doing activities and enjoying interpersonal relationships.

Adolescents with CP enjoyed performing joyful, entertaining and even energizing activities such as engaging themselves in sports and other exciting experiences. Their interest in performing activities within their ability range was clear. Surfing the internet and using social networks were two of these adolescents' interests. Many of them also expressed an interest in recreation with family and friends while others were interested in being alone while they had no particular interest in communicating with others.

One participant mentioned her interests as:

I am entertaining myself with a TV show to soothe myself.... it has a calming effect.... I like cooking and cleaning the house just as a housewife. (p 7)

## **Environmental features**

Physical environmental features exerted a decisive influence on the volition on these individuals.

Adolescents did not attend places with stairs not adapted to their movement. They showed interest in attending public places such as a park with stairs even though it was without a banister for individuals with walking disabilities.

One adolescent mentioned these environmental restrictions as follows:

When my friends want to go gaming, I can't go because of the stairs. I can't even go to many places because of stairs... I hate classroom chairs and desks because they cause some numbness in my feet... there must be a person next to me so that I can sit on the chair. (p 5)

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Social environmental features also had either an inhibiting or facilitating role. As an inhibiting role, the family's overprotection caused a decreasing tendency for their children to undertake activities. In some cases, their friends mocked their physical disability or even underestimated their abilities at school and social environments. As a facilitating role, some of the adolescents' families had a strong belief in their abilities to support and encourage their children in performing various activities.

One mother noted how her daughter was encouraged:

Her father, in addition to being a father, is her friend... for example, if her father says you can or you could do it well, she is encouraged to act better. (p 4)

## Discussion

The findings in this study provide an understanding of the volition in the Iranian sample of adolescents with CP based on MOHO.

### Value

As the values expressed by participants were family and community-related and individual values, they appeared consistent with the Schwartzian value theory in identifying ten basic values that are derived from the universal requirements of human existence [18]. One of the ten basic values, achievement, involves personal success accompanied by competency [18]; in this study, looking ahead closely matched this value. These adolescents planned for a more successful future and, as a result, they performed the appropriate activities to reach their goal. In some adolescents, looking ahead involved a healthy hope that they would succeed in future in healing their physical disability. Another Schwartzian basic value, power, as social status and prestige, control or dominance over people and resources [18], is matched with the tendency to be consistent. Moreover, some of these adolescents have strong religious beliefs and engage in religious activities in the belief that they will satisfy God and, even more importantly, this will result in being healed. These findings appeared to be consistent with various studies [18,44,45] that showed that tradition, which is defined as respect, commitment and acceptance of the customs and ideas that traditional culture or religion provides the self, is valued by adolescents. Iranian society is value-based [46]. Since Iranian society is a religious one and inclined towards spiritual values [47], in this study, adolescents with CP rely on beliefs and spirituality to achieve social values. Moreover, it was very important for adolescents to have a social relationship with their friends and family. This is in line with security, also termed as safety, which involves the 'harmony and stability of society, of relationships and of self' [18]. In addition, self-direction indicates independent thought and action [18], which was consistent with the adolescents' tendency to acquire independence in this study.

Some of adolescents in this research believed in their disability, subjective negative experience of being unable to do things. For instance, they believed that they would never achieve their goals, walk any further, or find a job, and thus felt a limited ability to perform various activities; this can be attributed to their belief in their disability. It is what has been presented in the previous research [20–22] that people with CP have a lower self-concept compared to healthy controls. Moreover, impairments experienced by individuals with CP have led to limitation in activity which subsequently decreased their self-concept [20,22]. However, Adamson [24] stated that there may be a very positive self-concept in CP adolescents in comparison to the typically developing peers. It seems that the level of impairment is contributing the self-concept which means that higher self-concept is associated with lower impairment levels and greater participation [20].

### Interests

Adolescent participants in this study expressed the idea that they enjoy having fun with family and friends. This interest seemed to be something that they would value too. It also had a lot to do with environmental features. In some cases, environmental restrictions, such as inconvenience of the buildings to attend social events, were reported as a limitation. This was expressed as a factor that influenced their sense of joy and accordingly their lack of engagement in activities that they enjoyed. Adolescents' interests, which depend very much on social context, are transformed in places involving peer groups, where they are pressured into new interests that differ from the ones in the family setting, where interests are often family centred [48]. Adolescents' interest in academic topics, achievement, and career selection may be positively or negatively influenced by friends or peers in or outside the school [49]. They endeavour to tailor their interests to their friends' interests and select friends with similar interests [25]. Interests in

social interaction, spending time with friends, going out, partying and shopping are regarded as socializing [25]. As these findings show, an important source of interest in adolescence is socializing because it precipitates feelings of intense engagement and belonging [50]. Therefore, satisfying the sense of belonging as well as socializing happen within the context of sharing interests while in these adolescents are restricted by the environment.

Enjoying performing activities was another category where adolescents enjoyed performing joyful, entertaining, and even energizing activities. Similar to the previous study [51] that related interests to particular objects, such as existing events, activities or ideas, adolescents in this sample showed diversity in their interests despite their physical conditions. Having physical limitations in comparison to their normal peers, these adolescents performed most of their interests passively (such as watching TV, listening to music, writing and activities like that). Adolescents may also seek opportunities for further engagement in these interests [52–54].

## Personal causation

Adolescents showed different perceptions of their ability levels which sometimes changed slowly in interacting with their values, interests and the environment. Some of the adolescents with CP found themselves able to achieve the desired outcome in performing a variety of occupations. In contrast, to engage in activities, others had the feeling of a limited ability including inadequate time and skill, and feelings of limited physical ability and mental resistance to learning new activities. These perceptions, reflecting their self-efficacy, appeared consistent with studies that demonstrate the person's ability to produce the desired effects or outcomes [15,16]. Based on the social cognitive theory by Bandura [55], environment has an important role in self-efficacy. Since these adolescents (especially GMFCS level III) are faced with limiting factors in social and physical environment, the level of self-efficacy in these people was low. In fact, performing different occupations such as managing the home environment, helping with household chores, and performing physically demanding occupations confirmed a higher level of self-efficacy in these individuals. This is in line with another study which showed that in young adults with a disability, including CP, participation is associated with a higher level of self-efficacy [56]. Some studies revealed how a diverse range of positive and negative factors were associated with participation in physical activity [57–59]. This was illustrated in their level of participation in their occupations despite their physical disability. The impact of self-efficacy in participation in activities was emphasized by others as well.

## Environmental features

Adolescents in this study constantly complained about lack of adaptation in the house for self-care activities due to a difficult and time-consuming process that depended on the family's assistance. They also complained about lack of a suitable physical environment outside the house and lack of space for playing sports that placed limitations on their ability to participate in social activities. These findings appeared to be consistent with the studies that show the physical environment, as well as supportive and limiting factors influence adolescents participation in daily life [26,27]. Inasmuch as Physical environmental barriers significantly contribute to quality of life of people with CP [60], in this study, the adolescent participants suffered from impatience, loneliness and lack of volition.

Participants presented their perception of the level of support they received from the social environment as positive or negative. For instance, belief in their ability by others was perceived as a positive influential factor on these adolescents' participation, while overprotection that emphasized disability was considered as a limiting influential factor. Interestingly, using offensive language presented a strong negative impact on these adolescents' ability to participate in a social context. Other studies also emphasized the limitations and support of social environmental factors influencing social participation among persons with CP [26,27]. In this study, family played a significant role in the individual's interests by encouraging or preventing them. Mothers may prevent these adolescents from practicing autonomy that is a psychological need in adolescents [61]. In this study, mothers were often overprotective of their adolescents, which had an impact on the level of autonomy attained. Being unable to achieve in these adolescents was presented as a problem in this sample. Adolescents with CP are faced with disability-related challenges during transitions [62]. For instance, they have a desire to become more autonomous, in spite of the fact that they depend on their parents' assistance for personal care [63] and have to cope with negative comments from others [64]. These findings can be explained by the research that shows children's behaviour is shaped by setting limits and rules regarding what is acceptable and unacceptable behaviour, namely behavioural control [65]. This is an important aspect of child and

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adolescent socialization across cultural contexts [66]. In previous research, it has been noted that too much behavioural control is negatively linked to adolescent adjustment [66]. An important issue facing parents is finding a healthy balance between excessive and insufficient parental involvement. Adolescents are less likely to be motivated to pursue their goals and complete their schoolwork if their parents are too involved, or even insufficiently involved [67].

In this study, the environment played a significant role in motivation. Hence, motivation in these adolescents can be divided into intrinsic motivation, referring to volition and extrinsic motivation, referring to environmental features. From the particular physical, social, cultural, economic and political environmental factors that influence their motivation, the physical and social environmental features in the Iranian context of adolescents with CP played even a more important role in shaping the individual's motivation in interaction with the individual's volition. However, there is always the question of whether shaping intrinsic motivation happens within a family or environmental context. Thus, we are unable to completely separate one from the other and to study how the values or beliefs of the immediate social context and family, and/or the community have shaped the intrinsic motivation. Participants alluded to facilitating and barrier factors affecting adolescent motivation. The interaction between the person and the environment influencing occupational performance is addressed by the theoretical framework used in this study, MOHO [15]. Here, the interaction between the person and the environment depends on the social and physical characteristics of the environment and on each person's values, interests and formation of personal causation as the volition behind their activities [15].

According to the aforementioned, it seems use of MOHO, as a conceptual model, in Iranian culture and for adolescents with CP will be practical for motivating them. As this model is able to reflect client's needs and provide their holistic perspective with respect to cultural background [15].

## Conclusion and clinical implications

This study provides an improved understanding of the volition with MOHO as the theoretical framework among Iranian adolescents with CP. While the interaction between the person and the environment influences occupational performance, motivation in adolescents with CP entails volition, as an intrinsic motivation, in interaction with environmental features, as extrinsic motivation. Adolescents with CP in Iran are value-based individuals. As a result, one of the important factors in motivating them is adherence to their values. Moreover, physical and social environments as limiting factors can reduce adolescent's motivation. A significant finding is that the most important factor affecting the intrinsic motivation of these adolescents is their personal causation. This finding lays the foundation for the role of occupational therapists in promoting motivation among these adolescents by (i) focussing on developing self-efficacy that promotes personal causation, socializing, and interests as a form of intrinsic motivation, (ii) adapting the physical environment, (iii) changing the attitude of others to adolescents with CP and (iv) using appropriately positive language in social communication.

## Methodological considerations and limitations

The focus of this study has been on the adolescents with GMFCS level I–III. Inasmuch as motivation may differ between the children who walk and children with limited self-mobility [68], the findings of this study cannot be transferred to other adolescents with CP, GMFCS level IV and V. Therefore, it recommends exploring the elements that contribute to the volition of adolescents with CP, GMFCS level IV and V, from their own experience. In this study, most of participants (parents) were mothers. Mainly because of the financial management of having a disabled child, the fathers in this study spent their time outside to earn a living. As a result, they could not provide any valuable information about their child's experience. A further recommendation is to explore which elements contribute to the volition of adolescents with CP from father's viewpoint. Finally, as it has been mentioned in the discussion section about the importance of environment, exploring and comparing the effects of other MOHO environments on the volition of adolescents with CP is recommended.

While the participants discussed their perspectives on adolescents' volition, the findings cannot be generalized to other patient groups. The applicability of the findings, particularly with respect to supporting the concept of volition category in MOHO increases since participants in this study were of both genders, at various GMFCS level I–III, and indifferent ages. Moreover, when data analysis was consistent with the volition of the MOHO, dependability and conformability of the data were corroborated by multiple reviewers (familiar with both MOHO and adolescents with CP) to ensure that the participants' viewpoints were adequately interpreted.

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The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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## References

1. Rosenbaum P, Paneth N, Leviton A, et al. A report: the definition and classification of cerebral palsy April 2006. *Dev Med Child Neurol Suppl.* 2007;109:8–14.
  2. Oskoui M, Coutinho F, Dykeman J, et al. An update on the prevalence of cerebral palsy: a systematic review and meta-analysis. *Dev Med Child Neurol.* 2013;55:509–519.
  3. Sajedi FSF, Ahmadi M. Cerebral palsy in children. *J Health Care.* 2014;15:88–97.
  4. Vroland-Nordstrand K, Eliasson AC, Krumlinde-Sundholm L, et al. Parents' experiences of conducting a goal-directed intervention based on children's self-identified goals, a qualitative study. *Scand J Occup Ther.* 2018;25:243–251.
  5. Miller L, Ziviani J, Ware RS, et al. Mastery motivation: a way of understanding therapy outcomes for children with unilateral cerebral palsy. *Disabil Rehabil.* 2015;37:1439–1445.
  6. Majnemer A, Shikako-Thomas K, Lach L, et al. Mastery motivation in adolescents with cerebral palsy. *Res Dev Disabil.* 2013;34:3384–3392.
  7. Association AOT. Occupational therapy practice framework: domain & process. North Bethesda (MD): AOTA Press/American Occupational Therapy Association; 2014.
  8. Crone EA, Dahl RE. Understanding adolescence as a period of social–affective engagement and goal flexibility. *Nat Rev Neurosci.* 2012;13:636–650.
  9. Nelson EE, Jarcho JM, Guyer AE. Social re-orientation and brain development: an expanded and updated view. *Dev Cogn Neurosci.* 2016;17:118–127.
  10. Piekarski DJ, Johnson CM, Boivin JR, et al. Does puberty mark a transition in sensitive periods for plasticity in the associative neocortex? *Brain Res.* 2017;1654:123–144.
  11. Carlon SL, Taylor NF, Dodd KJ, et al. Differences in habitual physical activity levels of young people with cerebral palsy and their typically developing peers: a systematic review. *Disabil Rehabil.* 2013;35:647–655.
  12. Majnemer A, Shevell M, Law M, et al. Level of motivation in mastering challenging tasks in children with cerebral palsy. *Dev Med Child Neurol.* 2010;52:1120–1126.
  13. Ryan RM, Deci EL. *Self-determination theory: basic psychological needs in motivation, development, and wellness.* New York (NY): Guilford Publications; 2018.
  14. Salavati M, Vameghi R, Hosseini SA, et al. Comparing levels of mastery motivation in children with cerebral palsy (CP) and typically developing children. *Med Arch.* 2018;72:41–45.
  15. Kielhofner G. *Model of human occupation: theory and application.* Philadelphia (PA): Lippincott Williams & Wilkins; 2008.
  16. Maddux JE. *Self-efficacy. Interpersonal and intrapersonal expectancies.* Abingdon: Routledge; 2016. p. 55–60.
-

17. Verhoef JA, Bramsen I, Miedema HS, et al. Development of work participation in young adults with cerebral palsy: a longitudinal study. *J Rehabil Med.* 2014;46:648–655.
  18. Schwartz HS. Values and religion in adolescent development. Values, religion, and culture in adolescent development. The Jacobs foundation series on adolescence. Cambridge: Cambridge University Press; 2012.
  19. Skaalvik E, Bong M. Self-concept and self-efficacy revisited: a few notable differences and important similarities. *Educ Psychol Rev.* 2003;1:67–90.
  20. Cheong SK. Self-concept of children with cerebral palsy [dissertation]. Australia: Australian Catholic University; 2017.
  21. Soyupek F, Aktepe E, Savas S, et al. Do the self-concept and quality of life decrease in CP patients? Focussing on the predictors of self-concept and quality of life. *Disabil Rehabil.* 2010;32:1109–1115.
  22. Mutsaddi S, Mahapatra R. Comparison of self-concept of children with cerebral palsy and children without impairments. *Indian J Cereb Palsy.* 2016;2:32–36.
  23. Teplin SW, Howard JA, O'Connor MJ. Self-concept of young children with cerebral palsy. *Dev Med Child Neurol.* 2008;23:730–738.
  24. Adamson L. Self-image, adolescence, and disability. *Am J Occup Ther.* 2003;57:578–581.
  25. Slot E, Akkerman S, Wubbels T. Adolescents' interest experience in daily life in and across family and peer contexts. *Eur J Psychol Educ.* 2018;34:25–43.
  26. Wintels SC, Smits DW, van Wesel F, et al. How do adolescents with cerebral palsy participate? Learning from their personal experiences. *Health Expect.* 2018;21:1024–1034.
  27. Shields N, Synnot AJ, Barr M. Perceived barriers and facilitators to physical activity for children with disability: a systematic review. *Br J Sports Med.* 2012;46:989–997.
  28. Wong SR, Fisher G. Comparing and using occupation-focused models. *Occup Ther Health Care.* 2015;29:297–315.
  29. Lee SW, Kielhofner G, Morley M, et al. Impact of using the Model of Human Occupation: a survey of occupational therapy mental health practitioners' perceptions. *Scand J Occup Ther.* 2012;19:450–456.
  30. Statistical Center of Iran. Selected findings of the 2016 national population and housing census 2016 [15 october 2019]. Available from: [https://www.amar.org.ir/Portals/1/census/2016/Census\\_2016\\_Selected\\_Findings.pdf](https://www.amar.org.ir/Portals/1/census/2016/Census_2016_Selected_Findings.pdf).
  31. Parvizy S, Ahmadi F. A qualitative study on adolescence, health and family. *Ment Health Fam Med.* 2009;6:163–172.
  32. Garrusi B, Garousi S, Safizadeh H. Identifying the norms of general population regarding child maltreatment, Kerman, Iran. *J Basic Appl Sci Res.* 2013;3:36–42.
  33. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res.* 2005;15:1277–1288.
  34. Speziale HS, Carpenter DR. Qualitative research in nursing: advancing the humanistic imperative. Philadelphia (PA): Wolters Kluwer Health/Lippincott Williams & Wilkins; 2011.
  35. Patton MQ, Fund R. Qualitative research & evaluation methods. Thousand Oaks (SA): SAGE Publications; 2002.
  36. World Health Organization. The health of young people: a challenge and a promise. Geneva, Switzerland: World Health Organization; 1993.
  37. Canadian Paediatric Society. Age limits and adolescents. *Paediatr Child Health.* 2003;8:577–578.
  38. Bundy DA, de Silva N, Horton S, et al. Child and adolescent health and development: realizing neglected potential. Child and adolescent health and development. 3rd ed. Washington (DC): The International Bank for Reconstruction and Development/The World Bank; 2017.
-

39. Riahi A, Rassafiani M, Binesh M. The cross-cultural validation and test-retest and inter-rater reliability of the Persian translation of parent version of the Gross Motor Function Classification System for children with. Cerebral palsy. *J Rehabil.* 2013;13:25–30.
  40. Palisano R, Rosenbaum P, Walter S, et al. Development and reliability of a system to classify gross motor function in children with cerebral palsy. *Dev Med Child Neurol.* 1997;39:214–223.
  41. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. *Field Method.* 2006;18:59–82.
  42. Zhang Y, Wildemuth BM. Qualitative analysis of content. Applications of social research methods to questions in information library science. Vol. 308. Santa Barbara, CA: ABC-CLIO; 2009.
  43. Lincoln YS, Guba Y, Guba EG, et al. Naturalistic inquiry. Thousand Oaks (CA): SAGE Publications; 1985.
  44. Arnett JJ. Adolescence and emerging adulthood. Boston (MA): Pearson; 2014.
  45. Davis RF, III, Kiang L. Religious identity, religious participation, and psychological well-being in Asian American adolescents. *J Youth Adolescence.* 2016;45:532–546.
  46. Yazdani F. The dynamic nature of attributing meaning and value to occupation in Iran. *J Occup Sci.* 2012;19:371–375.
  47. Sharajabad FA, Mohammad-Alizadeh Charandabi S, Mirghafourvand M. Life satisfaction and its relationship with spiritual well-being and religious practice in Iranian adolescent girls. *Int J Adolesc Med Health.* 2017;31:1–7.
  48. Csikszentmihalyi M, Halton E. The meaning of things: domestic symbols and the self. Cambridge: Cambridge University Press; 2012.
  49. Bergin DA. Social influences on interest. *Educ Psychol.* 2016;51:7–22.
  50. Coatsworth JD, Sharp EH, Palen LA, et al. Exploring adolescent self-defining leisure activities and identity experiences across three countries. *Int J Behav Dev.* 2005;29:361–370.
  51. Renninger KA, Hidi S. The power of interest for motivation and engagement. Abingdon: Routledge; 2015.
  52. Hofer M. Adolescents' development of individual interests: a product of multiple goal regulation? *Educ Psychol.* 2010;45:149–166.
  53. Moeller J, Dietrich J, Eccles JS, et al. Passionate experiences in adolescence: situational variability and long-term stability. *J Res Adolesc.* 2017;27:344–361.
  54. Tsai YM, Kunter M, Lüdtke O, et al. What makes lessons interesting? The role of situational and individual factors in three school subjects. *J Educ Psychol.* 2008;100:460–472.
  55. Bandura A. Health promotion from the perspective of social cognitive theory. Understanding changing health behaviour: from health beliefs to self-regulation. London: Psychology Press; 2013.
  56. Bent N, Jones A, Molloy I, et al. Factors determining participation in young adults with a physical disability: a pilot study. *Clin Rehabil.* 2001;15:552–561.
  57. Bloemen MA, Backx FJ, Takken T, et al. Factors associated with physical activity in children and adolescents with a physical disability: a systematic review. *Dev Med Child Neurol.* 2015;57:137–148.
  58. Verschuren O, Wiart L, Hermans D, et al. Identification of facilitators and barriers to physical activity in children and adolescents with cerebral palsy. *J Pediatr.* 2012;161:488–494.
  59. Wright A, Roberts R, Bowman G, et al. Barriers and facilitators to physical activity participation for children with physical disability: comparing and contrasting the views of children, young people, and their clinicians. *Disabil Rehabil.* 2018;41:1499–1507.
  60. Badia M, Orgaz MB, Gómez-Vela M, et al. Do environmental barriers affect the parent-reported quality of life of children and adolescents with cerebral palsy? *Res Dev Disabil.* 2016;49:312–321.
-

61. Van Petegem S, Antonietti JP, Eira Nunes C, et al. The relationship between maternal overprotection, adolescent internalizing and externalizing problems, and psychological need frustration: a multi-informant study using response surface analysis. *J Youth Adolesc.* 2019;49:162–177.
62. Lilly H, Bitzel M, Pejnovic T, et al. Barriers and characteristics for successful transition to adult healthcare for individuals with cerebral palsy: a systematic review. *Phys Ther Rev.* 2019;24:195–207.
63. Schmidt AK, van Gorp M, van Wely L, et al. Autonomy in participation in cerebral palsy from childhood to adulthood. *Dev Med Child Neurol Suppl.* 2019;62:363-371.
64. Lindsay S. Child and youth experiences and perspectives of cerebral palsy: a qualitative systematic review. *Child Care, Health Dev.* 2016;42:153–175.
65. Baumrind D. Authoritative parenting revisited: history and current status. *Authoritative parenting: synthesizing nurturance and discipline for optimal child development.* Washington (DC): US: American Psychological Association; 2013.
66. Mastrotheodoros S, Van der Graaff J, Deković M, et al. Coming closer in adolescence: convergence in mother, father, and adolescent reports of parenting. *J Res Adolesc.* 2018;29:846–862.
67. Alhadabi A, Aldhafri S, Alkharusi H, et al. Modelling parenting styles, moral intelligence, academic self-efficacy and learning motivation among adolescents in grades 7–11. *Asia Pac J Educ.* 2019;39:133–153.
68. Chang HJ, Chiarello LA, Palisano RJ, et al. The determinants of self-determined behaviors of young children with cerebral palsy. *Res Dev Disabil.* 2014;35:99–109.

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