วารสาร
เทคนิคการแพทย์และกายภาพบำบัด
JOURNAL OF MEDICAL TECHNOLOGY AND PHYSICAL THERAPY

นิพนธ์ต้นฉบับ
ORIGINAL ARTICLE

ทัศนคติของนักกายภาพบำบัดไทยที่ทำงานด้านเด็กต่อการใช้เทคนิคการกระตุ้นการประมวลผลการรับรู้ในเด็กสมองพิการ

สมนึก ส่งวาณิชย์[1, 2]*, Lorna Campbell[2]

Received: *June 5, 2014*
Revised & Accepted: *June 30, 2014*

บทคัดย่อ

บทนำ: ความผิดปกติของการรับรู้เป็นปัญหาหนึ่งของเด็กสมองพิการที่สามารถจัดการได้โดยใช้เทคนิคการกระตุ้นการประมวลผลการรับรู้ แม้นักกายภาพบำบัดไทยได้นำเทคนิคนี้มาใช้มากขึ้น แต่หลักฐานสนับสนุนประสิทธิภาพของเทคนิคนี้ยังไม่ชัดเจน ดังนั้น งานวิจัยนี้จึงต้องการศึกษาประสบการณ์ของนักกายภาพบำบัดไทยด้านเด็กต่อการใช้เทคนิคการกระตุ้นการประมวลผลการรับรู้ในเด็กสมองพิการ เนื่องด้วยข้อสันนิษฐานที่ว่าประสบการณ์ในการทำงานของนักกายภาพบำบัดมีอิทธิพลต่อประสิทธิภาพในการรักษาด้วยเทคนิคนี้ **วิธีการศึกษา:** การวิจัยเชิงคุณภาพนี้ใช้วิธีการเชิงปรากฏการณ์วิทยาเพื่อรวบรวมประสบการณ์ของผู้เข้าร่วมงานวิจัยโดยการสัมภาษณ์แบบกึ่งโครงสร้างผ่านทางโทรศัพท์ในนักกายภาพบำบัดด้านเด็กจำนวน 8 คนที่ใช้เทคนิคการกระตุ้นการประมวลผลการรับรู้ในการรักษาเด็กสมองพิการในช่วง 1 ปีที่ผ่านมา **ผลการศึกษา:** ข้อมูลที่ได้จากผู้เข้าร่วมงานวิจัยมีความใกล้เคียงกัน โดยผู้เข้าร่วมงานวิจัยส่วนใหญ่รู้จักเทคนิคกากระตุ้นการประมวลผลการรับรู้จากการศึกษาในชั้นเรียน แต่นักกายภาพบำบัดมักเกิดความสับสน เมื่อนำเทคนิคดังกล่าวมาใช้ร่วมกับการรักษาทางกายภาพบำบัดอื่นๆ การศึกษานี้พบว่าบทบาทในการรักษาที่ทับซ้อนกันระหว่างนักกายภาพบำบัด และนักกิจกรรมบำบัดไม่ใช่ปัญหาของการนำเทคนิคนี้มาใช้ แต่ปัญหาที่แท้จริงจากการใช้เทคนิคนี้คือการสื่อสารในการทำงานระหว่างนักกายภาพบำบัดและนักกิจกรรมบำบัด **สรุปผลการศึกษา:** การศึกษาเพิ่มเติมเกี่ยวกับเทคนิคการกระตุ้นการประมวลผลการรับรู้เพื่อให้เกิดความเข้าใจทั้งในด้านทฤษฎีและการปฏิบัติ ทักษะการเลือกใช้อุปกรณ์การตรวจประเมิน รวมทั้งการมีปฏิสัมพันธ์ในการทำงานร่วมกันระหว่างนักกิจกรรมบำบัดและนักกายภาพบำบัด จะช่วยพัฒนาการนำเทคนิคการกระตุ้นการประมวลผลการรับรู้มาใช้ในการรักษาทางกายภาพบำบัดให้เกิดประสิทธิภาพมากยิ่งขึ้น

คำสำคัญ: เด็กสมองพิการ, การกระตุ้นการประมวลผลการรับรู้, นักกายภาพบำบัด, ทัศนคติ

[1]คณะกายภาพบำบัด มหาวิทยาลัยหัวเฉียวเฉลิมพระเกียรติ ประเทศไทย
[2] คณะ Health and Wellbeing มหาวิทยาลัย Sheffield Hallam ประเทศสหราชอาณาจักร
* ผู้รับผิดชอบบทความ

วารสาร
เทคนิคการแพทย์และกายภาพบำบัด
JOURNAL OF MEDICAL TECHNOLOGY AND PHYSICAL THERAPY

นิพนธ์ต้นฉบับ
ORIGINAL ARTICLE

Perspective of Thai paediatric physiotherapist on using sensory integration therapy in children with cerebral palsy

Somnuek Songvanich[1, 2]*, Lorna Campbell[2]

Abstract

Introduction: Sensory deficit is a problem in children with cerebral palsy (CP) which can be managed by using sensory integration (SI) therapy. The use of this intervention is gaining popularity in paediatric physiotherapy in Thailand although; the evidence to demonstrate its effectiveness is still unclear. Therefore, this study explored experience of physiotherapist who used SI therapy in children with CP regarding it has been postulated that experience of therapist influence on the effectiveness on using of this intervention. **Methods:** This qualitative study used a phenomenological approach to gather experience from 8 Thai paediatric physiotherapists who used SI therapy in children with CP within the past year using semi-structured interview via telephone Skype. **Results:** Information from every participant in each theme is almost the same. Mainly, an initiate learning of SI concept came from formal study. For clinical practice, the use of SI approach with other physiotherapy interventions made confusion on their SI practice. The role overlap was not a problem from using this intervention. The actual problem is communication between occupational therapists and physiotherapists. **Conclusion:** Further understanding on SI theory and practice, the use of outcome measure and collaboration between occupational therapist and physiotherapist were recommended to improve the use of SI approach in physiotherapy practice.

Keywords: Cerebral palsy, Sensory integration therapy, Physiotherapist, Attitude

[1]Faculty of Physical therapy, Huachiew Chalermprakiet University, Thailand
[2]Faculty of Health and Wellbeing, Sheffield Hallam University, United Kingdom
* Corresponding author: (e-mail address: s_songvanich@yahoo.com)

Introduction

Cerebral palsy (CP) is a group of non-progressive neurological disorders that affects movement and postural development of the children. Basically, the presence of motor impairment in CP is strongly due to an injury of periventricular area in the brain [1]. However, dysfunction of the gross motor functions in CP may have a correlation with sensory deficit. It would be said that if children have a problem to gather sensory information as a result of damage to sensory pathways and it affects on their motor movement, therapists may need to consider an intervention to manage this problem [2].

Sensory integration (SI) therapy has been introduced to manage sensory and motor problems in CP. It is an active activity which is the theory of Ayres [3] that aims to adapt their responsiveness to tactile, proprioceptive and vestibular senses. The therapeutic concepts hypothesize that providing an opportunity to enhance these sensory intakes will improve ability of the central nervous system to process and integrate sensory input and subsequently improve motor functions of the children [4].

In Thailand, the use of SI therapy has been increasing in paediatric physiotherapy management for children with CP. Nevertheless, there are only a few studies which demonstrate the effectiveness of this intervention specifically in children with CP. For instance, Shamsoddini and Hollisaz [5] found a significant improvement ($P < 0.05$) of gross motor functions of children with CP after they received SI therapy. However, this study did not state about sensory problems of the participants. The fact is that sensory deficit does not present in all children with CP and the degrees of responsiveness of individuals depend on severity of impairment. Although the use of SI is gaining popularity in paediatric physiotherapy in Thailand, the evidence to demonstrate its effectiveness is still unclear. The researchers believed that experience of therapists, as a practitioner, is important to promote and reflect the effectiveness of SI therapy [6]. Therefore, this study explored experience of paediatric physiotherapists in Thailand who used SI therapy in their CP management. It has been postulated that the effectiveness of this intervention can be attributed to therapists' understanding, decision making and expectations; therefore these 3 component areas were explored in the study.

Methods

The phenomenological approach was used in this qualitative study to gather information from physiotherapists' experiences as it helps to explore perception of people within situational context from their experience [7].

Participants

Paediatric physiotherapists who used SI therapy in children with CP throughout Thailand were the target population in this study. The participants were recruited from the Thai Paediatric Physical Therapy Group (TPPTG) and the universities where teaching physiotherapy. TPPTG is a grouped e-mail which has been built up to share knowledge and experience among paediatric physiotherapists in Thailand. Seventy seven members and thirteen physiotherapy schools were identified from TPPTG and Thai Physical Therapy Council respectively. Of the identified population, ten physiotherapists agreed to participate in this study. The screening questions were used to ensure that information was gathered from physiotherapists who used SI therapy in their CP management within the past year as it is enough time frame to capture physiotherapy practice within an adequate case load and also not too long to introduce recall bias [8]. Two of them did not meet the study criteria therefore, there were eight participants in this study.

Data collection procedure

A semi structured interview was used to gather experience and in depth information from participants [9]. In this study, the researcher was the main data collector to avoid missing any important information for the study especially specific jargon that is hard to understand for non paediatric therapists [10]. Based on influencing factors on SI therapy practice from the literature reviews, a topic guide was built up to help the researcher to explore experience of the therapists. Understanding, decision making and expectations on SI therapy were the three main areas of questions in the topic guide. A problem regarding geography and cost limitation of the research product, Skype was used in the interviews. However, for those who were not familiar or not convenient with Skype, general telephone lines were also used. The conversation lasted approximately 45 minutes to an hour per participant and was recorded in order to write up a transcript. Then the transcripts were sent back to each participant to ensure that there was no missing or inexact information between transcribing and interviewing. In the interview, all participants spoke in Thai, therefore the transcripts were translated to English. This study was reviewed and granted ethical approval by Sheffield Hallam University Human Research Ethics Committee.

Data analysis

Framework analysis [11] was adopted to analyze the data in this study. Texts from the transcripts were coded individually by the author to ensure inter-rater reliability [12]. The coding which was derived from the aim of the study, literature reviews and narrative of participants were identified thematic frameworks. Then, these coding were indexed and managed to each category. The categories of individuals were combined to identify pre-determined themes for data interpretation.

Results

Details of the participants are included in **Table 1**. All of them were female with the average experience in paediatric rehabilitation 8 years (range from 3 to 10 years) and used SI therapy in their management within the past year. Key themes which emerged from the study and their associated concepts are explained in the following text.

Table 1 Profiles of participants.

Participant	Year of experience in paediatric rehabilitation	Clinical setting	Highest education
A	8	Physiotherapy school	Master degree
B	10	Physiotherapy school	Master degree
C	10	Private practice	Bachelor degree
D	3	Physiotherapy school	Master degree
E	8	Government hospital	Bachelor degree
F	10	Physiotherapy school	Doctoral degree
G	10	Physiotherapy school	Master degree
H	5	Private practice	Master degree

Theory of sensory integration

For the understanding of participants on the theory, they defined SI as a relationship between a sensory input, an integration of sensory information and the respond of sensory process on environment. Normally, humans receive sensory information from various inputs such as visual, auditory, olfactory, tactile, vestibular and proprioceptive receptions. Then this information will be adjusted in order to perform a good response which they refer to motor movements.

Sensory integration background

Seven from eight participants stated that they began to know about SI from formal learning. Three of them studied it in an undergraduate degree, while others had learned from a postgraduate study. However, the first group mentioned that they had learned only basic concept of SI. They became to understand it more from the postgraduate study or the physiotherapy conferences. Only one participant stated that she learned about SI from the advice of occupational therapists (OT) and observed their clinical practicing in the past working experiences. After that, the deep understanding of SI came from postgraduate study.

Nature of cerebral palsy

Problems which were found in children with CP were answered when therapists were asked regarding the using of SI therapy in CP. The primary problem in these children is motor impairment. However, there are more than motor problem in CP as a result of damage to the brain. Spasticity, hypersensitivity, reflex problem, postural control problem, sensory deficit and integration dysfunction are associated problems which can be found in CP and they may impact on motor function.

"It is because CP has associated problems. They do not have only a problem on motor system... to initiate movement, body systems have to receive sensory information and integrate it. In children with CP, their integration process does not work properly as a resulted of damage to the brain."

Clinical reasoning

Regarding the evidence to demonstrate the effectiveness of SI therapy in children with CP is still not clear, the following rational were given to support the use of this intervention.

: The theories

The theory which arose from participants was sensory motor control. They believed that sensory and motor systems are important components of movement because they work together in order to produce motor response.

"*...changing of postural control or movement is a resulted of co-operation between sensory and motor system. If we want to change or adjust something, we cannot do it from only one side as the body system is working together."*

In addition, SI theory was also given as it is a direct technique that influences on the motor system. *"I thought that an integrative process of neural system influences on movement or motor response as it works along with an action of muscle."*

: Clinical experience

An improvement of gross motor function is an expectation from using SI therapy as it is a primary goal of physiotherapy treatment. However, without an improvement of sensory and integration functions, the progression of motor movement cannot be performed. From experience of the participants, these expectations were improved after using this intervention in children with CP.

"I used it because outcome after treatment is effective so, I still continually used it."

: Satisfaction

All participants used SI therapy because they liked it. Children had participated during a training session as a result of an attraction of this intervention.

"I found that children were happy and always had a good response during the treatment."

Clinical evaluation

An evaluation is necessary in order to plan a treatment programme. Normally, an observation of childrens' behaviour and the physiotherapy assessment were used to evaluate CP. Nevertheless, some of them stated that the evaluation is not proper as they cannot detect all presentations of SI. Even though SI evaluation was mentioned, these participants did not use it regarding this assessment as it was usually used by an OT.

"I did not specific to use SI test like OT or other SI specialists. I normally used physiotherapy assessment to evaluate them."

Selection of patient

The use of SI therapy can be divided into two groups. The first group considered that the presentation of problems in children with CP was different hence SI therapy was applied only in cases that related to sensory and integration problems.

"*It depends on individual condition... If the impairment that we found relates to sensory system, SI therapy will be applied."*

One of them added;

"*It does not mean that children lost sensation but, sensory information need to be adjusted or enhanced to work more properly."*

On the other hand, SI therapy was used in all CP because sensory and integration systems are part of children. Nevertheless, the selection of this intervention also depended on the majority of the problem, time, equipment and clinical setting and participation of children.

Sensory integration in physiotherapy practice

In clinical practice, SI therapy was normally used with other physiotherapy interventions in CP management. Bouncing, approximation, distraction and weight bearing were techniques that they normally used. Some participants did not feel confident regarding their clinical practicing on using SI therapy as they felt techniques of this intervention were not different to other approaches that they usually used together.

"For example, in children with developmental delay and blindness, tactile stimulation was considered in this case including other manual treatments such as NDT or PNF. An approximation or distraction of joint sense which is a part of both SI therapy and manual stimulation was used to guide movement. Sometimes, it made me confuse that these techniques belong to which interventions."

On the other hand, some participants stated that actually almost therapists already used SI therapy in their CP management, but they did not know.

"I thought that physiotherapists in Thailand understand SI in term of sensory-motor stimulation. If we take a look on the concept of sensory integration, we will see an exercise ball or an equilibrium board that we have been using in our management..."

From these points of view, they suggested that the understanding on SI influences on the effectiveness of the using of this intervention. Therefore, they recommended physiotherapists in Thailand to learn more about SI in order to improve their clinical skills. In addition, research which demonstrates how SI therapy can be applied in physiotherapy management is required as it will inspire therapists to use this approach.

Equipment and clinical setting

The aim of SI therapy in the understanding of participants is a process which enhances the ability to integrate sensory information from the environment by providing a sensory input. The treatment usually stimulates via visual, tactile, proprioceptive and vestibular receptors because these senses are particularly relevant to physiotherapy management. Equipment such as an exercise ball, balance board and roller including the clinical setting are important as they provide sensory information. This equipment was already set in the physiotherapy setting. However, equip-

ment and clinical setting should be adapted from the environment surrounding patients as they would enable to do the exercise at home.

Sensory integration therapy between physical and occupational therapy

All therapists stated that SI therapy in Thailand is normally used by OT as it is part of their main treatments. According to different goals of treatment and groups of patients on using this intervention between these two therapies, participants suggested that physiotherapists should learn more about this approaches as they thought it is useful in their CP management. They would like to exchange SI therapy experience with OT to improve their clinical practice. However, from their experiences they found out that the communication between physiotherapist and OT still have a problem in Thailand.

"...there are many techniques of SI therapy that have benefit on physiotherapy management for children with CP. However, there is lack of cooperation and communication between physiotherapist and OT."

Discussion

From this study, SI therapy has become interesting for paediatric physiotherapists in Thailand in the past decade. Sensory input, integration procedure and motor output were three main components of SI in the understanding of participants. For the rational on using SI therapy in CP, therapists considered that damage to the brain in these children influences more than motor impairment. It also affects on other systems and leads to problems such as spasticity, sensory deficit and integrative dysfunction. Even though these associated problems were concerned from all participants, the selection of patients on using of this intervention was divided into two groups. Sensory motor control was the first given from all participants as the evidence to support their rational. For the concept of this theory, sensory, biomechanical and motor procedures are main components which was required along with the previous response in order to product efficient movement [13]. Therefore, SI therapy was considered to apply in CP management. Only the first group added the theory of SI influence on their patient selection.

Development of children which participants had seen from their experience was evidence that also supported the use of this intervention. An improvement of gross motor function was expected from therapists because it is a primary goal of physiotherapy treatment in CP [14]. However, this expectation cannot be achieved without an improvement of sensory or/and the integration procedure. Even though the written evidence to demonstrate the effectiveness of SI therapy is not clear, participants decided to use it from their previous experience as they found those improvements. Normally, the physiotherapy assessment and an observation from the behaviour of the children were used to evaluate CP both before and after treatment. Nevertheless, SI evaluation was suggested as it may be more appropriate to investigate SI related problem. Normally, there are two standardized outcome measures which are usually used to evaluate children with SI problem namely; sensory profile, sensory integration and praxis test [15]. The fact is that paediatric physiotherapists were unfamiliar with these measurements and limited time. Therefore, a modification of these sensory evaluations which can be used in physiotherapy management was recommended.

In clinical practice, SI therapy was used with other physiotherapy interventions in CP management. It is obvious because firstly, the evidence that participants used to support this intervention disagreed to the study of Hoon et al. [2]. Even though sensory deficit influences on motor function, therapists did not think that it was a main cause of gross motor impairment. Secondly, regarding the limitation of treatment

session, other physiotherapy interventions which directly focus on improvement of gross motor function was selected. From their opinion, SI therapy was added to achieve the goal of physiotherapy management. In addition, there are many factors that influence motor impairment in these children [16] therefore; the concept of SI may not improve development of these children.

Equipment and clinical setting was another factor which influences the clinical practice, satisfaction and selecting of treatment from participants' view. This factor provides sensory information which is part of the main concepts of this intervention. Reid [17] found that the motivation of CP can be promoted by environments which allow children to create, express or control the activity. Nevertheless, adaptation of equipment was also considered to provide home programmes.

However, the use of SI therapy with other interventions made confusion to participants. Therefore, they suggested that the understanding on SI theory influences on the use of this intervention which strongly agreed to the study of Tickle-Degnen [18]. A further SI study was recommended for themselves to improve their understanding. In addition, physiotherapists should learn more about SI therapy because their previous experience found that it is useful for CP. Research which demonstrates the use of SI therapy with other interventions is required as it may inspire or influence therapists to use this approach. An exchanging of SI knowledge between physiotherapists and OT was expected from participants as it will help to improve SI understanding and practicing. Even though an overlapping of roles between these two therapies in many working areas has been addressed for more than three decades [19], participants were not concerned that the use of the SI is a cause of this problem because their goals of treatment are different. The communication was issued as an actual problem between both therapists which may lead to the roles overlapping. Regarding the study of Newey [20], collaboration across disciplines is required to provide the best interest for children with CP.

This study showed that the understanding on sensory integration concept of Thai paediaric physiotherapists is still unclear and it may affect on the effectiveness of using this intervention. In their practical, they may also need more consideration about standardized outcome measures in their clinical evaluation to support their decision making and expectations from using this approach in children with CP. Collaboration between OT and physiotherapist may be improved by understanding each other's professional practice [21]. It may help therapists to promote the efficiency on using SI therapy with other interventions as collaboration allows staffs to share information [22]. The use of appropriate combination of interventions has been suggested that it helps therapists to achieve goals of treatment because it does not only promote function but also prevents secondary impairment and increases developmental capabilities of children with CP [23].

Small sample size is a limitation of this study. It might assume that theory of SI was mainly focused in formal learning while the therapy has been gaining popularity in Thailand from word of mouth. Therefore, physiotherapists may not be confident to participate in this study. Even though, results from sample size which less than 10 tend to be unstable [24], saturation of data was achieved in this study. Another limitation is data analysis method. Initially, content analysis was selected to analyze data. However, this data analysis focused to provide an actual phenomenon under research question rather than explore ideas of participants [25], therefore, framework analysis was used.

Conclusion

An increase of popularity on using of SI therapy in Thailand strongly comes from word of mouth rather formal learning which mainly focuses on the theory. Regarding the use of this intervention with other approaches in CP management, a further study on the effectiveness of using SI therapy with other physiotherapy interventions was recommended because it will inspire and also improve clinical practice experience of physiotherapists. The communication between OT and physiotherapists was also required as it is not only improving clinical experience of both disciplines but also providing the best interest for children with CP.

Acknowledgements

First of all, I would like to express my deep appreciation to Assoc. Prof. Dr. Sugalya Amatachaya for her kindness, support, excellent guidance and valuable advice throughout the completion of this study. I would like to thank all paediatric physiotherapists in Thailand who accepted to participate in this study including the modulators of the Thai Pediatric Physical Therapy Group and deans of physiotherapy schools who helped me to inform their members and staffs about my study. Without their participation, this study could not have been accomplished.

Grateful appreciation is further expressed to Miss Dina Mistry, Mr. Nitesh Mistry, Mr. Maytee Suksarn and Mr. Thanakorn Taveechokesupsin who appreciate improving my English grammar and expressions in this study.

References

1. Wilke M, Staudt M. Does damage to somatosensory circuits underline motor impairment in cerebral palsy. Dev Med Child Neurol 2009; 51: 686-7.
2. Hoon AH. Sensory and motor deficits in children with cerebral palsy born preterm correlate with diffusion tensor imaging abnormalities in thalamocortical pathways. Dev Med Child Neurol 2009; 51: 697-704.
3. Ayres AJ. Sensory integration and the child. Los Angeles, Western Psychological Services 1979.
4. Fisher AG, Murray EA, Bundy AG. Sensory integration, Theory and practice. Philadelphia, F. A. Davis Company 1991.
5. Shamsoddinin AR, Hollisaz MT. Effect of sensory integration therapy on gross motor function in children with cerebral palsy. Iran J Child Neurol 2009; 3: 43-8.
6. Cermak SA, Henderson A. The efficacy of sensory integration procedures. Sensory Integration Quarterly 1989; 1-23.
7. Cohan M, Kahn D, Steeves R, eds. Hermeneutic phenomenological research: a practical guide for nurse researchers, California, Sage 2000.
8. Luxford BK, Hale L, Piggot J. The physiotherapy management of infants with congenital muscular torticolis: a survey of current practice in New Zealand. NZ J Physiotherapy 2009; 37: 127-35.
9. Seidman I. Interviewing as qualitative research: A guide for researchers in education and social sciences. 3rd ed., New York, Teachers College Press 2006.
10. Denzin NK, Lincoln YS, eds. Handbook of qualitative research. 2nd ed., Thousand Oaks, Sage 2000.
11. Rabiee F. Focus group interview and data analysis. Proceedings of the Nutrition Society 2004; 63: 655-60.
12. Joshi A, Vaishampayan A. Sensory integrative therapy services in India – A qualitative analysis of parents' perspective. Indian J Occup Ther 2008; 40: 49-53.

13. Borghuis J, Hof AL, Lemmink, KA. The importance of sensory-motor control in providing core stability: Implication for measurement and training. Sports Med 2008; 38: 893-916.
14. Ostensjo S, Carlberg EB, Vollestad NK. Motor impairments in young children with cerebral palsy: relationship to gross motor function and everyday activities. Devel Med Child Neurol 2004; 46: 580-9.
15. Cermak SA, Mitchell TW. Sensory integration. In Mccauley RJ, Fey ME, eds. Treatment language disorders in children, Baltimore Md., Paul H. Brookes Publishing 2006; 435-69.
16. Bartlett DJ, Palisano RJ. Physical therapists' perceptions of factors influencing the acquisition of motor abilities of children with cerebral palsy: Implications for clinical reasoning. Physical Ther 2002; 82: 237-48.
17. Reid D. The influence of virtual reality on playfulness in children with cerebral palsy: A pilot study. Occup Ther Int 2004; 11: 131-44.
18. Tickle-Degnen L. Perspectives on the status of sensory integration therapy. Am J Occup Ther 1988; 42: 427-33.
19. Booth J, Hewison A. Role overlap between occupational therapy and physiotherapy during in-patient stroke rehabilitation: an exploratory study. J Int Care 2002; 16: 31-40.
20. Newey C. Improving care for children with cerebral palsy. Paediatr Nursing 2008; 20: 20-3.
21. Naidoo N, Budler L. The perceptions, attitudes and knowledge of physiotherapy and chiropractic student regarding each others' professional practice. South Afr J Physiother 2009; 65: 32-8.
22. Pinelle D, Gutwin C. Supporting collaboration in multidisciplinary home care teams. Proceedings of the AMIA Symposium 2002; 617-21.
23. Rosenbaum P. Cerebral palsy: what parents and doctors want to know? Br Med J 2003; 326: 970-4.
24. Velde BP. The experience of being an occupational therapist with a disability. Am J Occup Ther 2000; 54: 183-8.
25. Heish HF, Shannon SE. Three approaches to qualitative content analysis. Qual Health Res 2005; 15: 1277-88.