

Abstract

Research Aim: The objective of this pilot study was to assess the impact of night time positioning equipment (NPTE) for adults with complex health conditions and postural asymmetry on their activities of daily living, posture and quality of life.

Methods: Twelve Participants living in a care home trialled the NPTE equipment over twelve weeks. Qualitative and quantitative data was collated at week 0 and 12 using standardised measures. Semi structured interviews were conducted at the end of the study.

Findings: There were notable clinical effects of using NPTE on pain, sleep, weight, choke risk, and Waterlow scores on the participants. Effects on function, activities of daily living and quality of life were evident.

Conclusions: In this small pilot study it was found that the use of NPTE demonstrated clinical effects and notable significant effects on the older adults' activities of daily living, posture, and quality of life.

Background

Most adults spend seven to eight hours lying in bed at night and if the body's position is inadequately aligned, changes can take place resulting in a damaging effect on posture if sustained over a period of time (Cary et al., 2016). This is especially pertinent for people who are unable to alter their lying position due to complex health conditions, abnormality of muscle tone, and immobility (Goldsmith, 2000). Postural asymmetries, musculoskeletal deformity and weakened joint stability especially in the pelvis and trunk can develop (Robertson et al., 2018; Crawford & Stinson, 2015; Hill & Goldsmith, 2010). These asymmetries can lead to hip subluxation, dislocation, wind sweeping and spinal distortion

such as scoliosis; pain and discomfort can ensue with a profound effect on quality of life (Robertson et al., 2018; Polak et al., 2009). The consequences are unequivocal in terms of the effect on basic bodily functions, for example breathing, digestion and circulation, which in extreme cases can result in death (Innocente, 2014; Waugh and Hill, 2009). A potential answer to manage the effects of postural asymmetry is the use of night time positioning equipment (NPTE); however, the efficacy of this is largely untested especially in adults and is mainly anecdotal (Stephens & Bartley, 2018; Innocente, 2014). Whilst there is no specific definition of NPTE, the NHS buyers guide (2009, p.3) describes it as *“a postural support system which may contain one or more component parts that are held in position by a base layer or sheet”*. There are several NPTE systems available made from a wide variety of materials such as foam-covered wooden supports; glide and lock memory foam pads; cushioned guides and rigid padded brackets with rolls (NHS Purchasing & Supply Agency, 2009). Historically, NPTE has been used to address postural asymmetries despite a dearth of published evidence to support its use and what evidence is available is focussed on children with disabilities (Pountney et al., 2004). There is however, growing support advocating the need for research studies using NPTE with adults who present with complex postural asymmetries (Robertson et al., 2018; Crawford and Stinson, 2015; Innocente, 2014). This pilot study responds to the call for research in this important aspect of 24-hour postural management in adults with complex health issues and postural asymmetries.

Literature review

A search of the literature revealed a limited number of published articles on NPTE. All the articles were focussed on children with disabilities which limits the generalisability and transferability of the evidence to the adult population. According to De Brún (2013) in

situations where relevant research studies have not been conducted, it is pertinent and valid to base information on the evidence that is already available ensuring that it is clearly acknowledged.

Applying Sackett et al. (1996) hierarchy of evidence to the studies, highlighted that most of the evidence was lacking in robust methodological design, e.g. some were single case studies (Waugh, 2009; Hill & Goldsmith, 2010; Waugh & Hill, 2009), clinical evaluations (Goldsmith, 2000), expert opinion (Lange and Waugh, 2004), reviews of the literature (Innocente, 2014; Robertson et al., 2016; Wynne & Wickham, 2009), product focus (Collins, 2007) and a retrospective clinical audit (Pountney et al., 2002). Findings from this search of the literature is substantiated by Blake et al. (2012) who conducted a Cochrane Systematic Review and found that the research available was low quality, with only two small-scale randomised control trials reported. However, as the Cochrane Systematic Review focused solely on appraisal of randomised control trials (RCT) this review will consider the findings of five studies, three of which were excluded from the Blake et al. (2012) systematic review.

Hill et al. (2009) conducted a two-day pilot study examining the effect of NTPE on sleep quality and respiratory function of 10 children with severe cerebral palsy. Quantitative measures that were collected included: snoring and daytime sleepiness subscales of the Paediatric Sleep Questionnaire, polysomnography, and apnoea/hypopnoea index. In the findings the authors reported that in contrast to sleeping unsupported, oxygen saturation levels when using NTPE was higher for three children but lower for six children. There were no significant differences in sleep quality when the children used NTPE or were unsupported. Limitations of the study are that the evaluation was conducted in a sleep

laboratory and could affect the findings in comparison to use of the equipment in their own home environment. The sample population was small, and the children's parents completed the sleep questionnaire, and this could lead to response bias.

Mol et al. (2012) investigated whether 55 children with cerebral palsy using NTPE experience more sleep disturbance than 27 children with cerebral palsy who did not use night orthoses. In addition, the parents experience of NTPE as a burden, based upon the parent's personality trait and competence was also examined. Employing a cross sectional questionnaire design, the researchers collected data using a sleep disturbance scale, a parenting stress index, Big Five Inventory personality test, and parental burden of night orthoses inventory. The authors found that there was no statistical difference in sleep disturbance in either group. They also noted that parents who were outgoing and emotionally secure had lower scores in the parental burden than those who were introvert and emotionally labile. Limitations of the study are the small sample size, the use of questionnaires and not observations to measure the impact on sleep disturbance, and the burden of using NTPE assessed by parents only. Also, by employing a cross sectional design, the researchers do not allow for an exploration of cause and effect of sleep disturbances in any depth, and although the parents and physical therapists reported that 55 of the children used NTPE this relies on accurate and honest reporting and highlights the issue of compliance bias.

Dawson et al. (2013) used a prospective study approach to evaluate the effect NTPE use had on night to night ventilatory function of children with severe motor disorders in comparison to developing healthy children. 15 NTPE users and 17 healthy children alternated their sleep

position between the use of NTPE and unsupported sleeping for 14 nights. Oxyhaemoglobin saturation (SpO₂) was monitored each night for four consecutive nights and transcutaneous CO₂ for one night in each sleep condition. Dawson et al. (2013) found that NTPE could impair or enhance ventilatory function in a small group of children. They recommended that oxygen saturation levels should be measured for three nights prior to and following the introduction of NTPE. This is to establish optimal positioning for effective ventilation. Limitations included the small sample size that reduces the ability to explore causative mechanisms between sleep and ventilatory function. Also, selection bias was highlighted towards the recruitment of families of children with less complex medical and social circumstances.

Whilst the evidence base is developing on the effect of NTPE on ventilatory function, what was not apparent in some of the literature was the impact on body symmetry and quality of life of the participants involved. Royden et al. (2013) conducted an analysis of retrospective routine audit data of 58 children who used NTPE. Measurements included hip radiographs, Goldsmiths indices for body symmetry, hip abduction measurements and QOL measure (CP Child questionnaire) at baseline and twelve months post-intervention. The researchers reported improvements or no change in clinical measurements and QOL following introduction of NTPE, particularly regarding body symmetry in children with cerebral palsy. Limitations of this study are that the findings are unpublished and unavailable for further scrutiny. However, the findings do examine the wider impact of the use of NTPE on a child's body symmetry and quality of life.

By conducting a cross over design study, Underhill et al. (2012) evaluated the effect sleeping in a NTPE system had on the sleep-wake patterns and pain levels of eleven children with cerebral palsy in comparison to sleeping in an unsupported position. The participants slept for four nights using NTPE and four nights unsupported. Data was collected using an actigraphy and paediatric pain scale. The researchers reported that although there was no statistical difference in the findings across the two conditions. However, they found differences across responses from the participants and recommended that pain and sleep patterns are discussed when initially prescribing NTPE. Limitations of the study are that the children were already users of the NTPE and this could result in response and compliance bias. There is no information on who collated the data, nor their level of training and expertise.

Despite the lack of larger longitudinal randomised controlled studies with participants who have not used NTPE before, the recommendation for 24-hour postural care is becoming more prevalent to prevent or delay postural asymmetries (National Institute of Health and Care Excellence, 2012). As stated by Blake et al. (2012) research should include an examination of the effect of NTPE on sleep, pain and quality of life. The crux of the issue here is that the current evidence base is growing but lacks a body of support advocating research studies using NPTE with adults with complex postural asymmetries (Robertson et al., 2018; Crawford & Stinson, 2015; Innocente, 2014).

Methods

The purpose of the study was to assess the effect of a night time positioning sleep system

for adults with complex health conditions and postural asymmetry who lived in a UK care home facility.

The objectives were to:

- Measure the impact of using NTPE on the activities of daily living of the participants.
- Quantify changes between pain, sleep scores, weight, Waterlow risk score, choke risk score, and quality of life prior to and after the use of NTPE.

Design

Ethical approval was granted by the University of Salford UK, to conduct a small-scale pilot study. Using a mixed methods approach between September 2017 and April 2018, the researchers assessed the effects of introducing NTPE with twelve adults who have complex health needs and postural requirements. A variety of methods from posters on notice boards, letters to relatives and discussions between the lead nurse, the participants and their relatives were utilised in the recruitment process. Informed consent was obtained from participants themselves or relatives of those with reduced mental capacity (Royal College of Nursing 2011; Medical Research Council, 2007). At the beginning of the study, an assessment of the participant and their NTPE needs was carried out using an independent advisor. To reduce potential bias, the researchers supervised the delivery and set up of the equipment by the company. NTPE care plans were created using photographs to demonstrate correct use of the equipment for each participant. Training on the use of NTPE was provided to residential care facility staff.

Setting

The pilot study was conducted in a UK care home facility which provides both residential and nursing care to the residents. The purpose of choosing this setting was to respond to the call for more research in other healthcare settings where older people naturally reside (National Institute for Healthcare Research, 2018).

Subjects

From a population of forty residents, twelve older adults, all of whom had been identified as having multifaceted health and postural needs were recruited using an inclusion and exclusion criteria. In pilot studies ten to thirty participants are considered appropriate (Hill, 1996; Isaac, & Michael, 1995). Two participants died before the study concluded.

Equipment

The Simple Stuff Works NTPE was used for the duration of the study (www.simplestuffworks.com). Each participant after assessment was prescribed appropriate equipment to provide adequate postural support (see figure 1). The equipment used included soft fibre wedges, neck support pillows, foot supports and supine stabilisers.

Data Collection

On the first day of and at the end of the twelve-week trial period for each participant, quantitative data was collated using standardised measures: pain scales (Abbey et al, 2004),

sleep scores (Buysse et al., 1888), and weight. Other measures included: demographics, photographs, Waterlow (1988) score, choke risk and changes in medication. At week twelve qualitative data was also collected and digitally recorded verbatim using a semi structured interview schedule to explore the participants and relative's responses to the use of NTPE.

Data Analysis

Quantitative results were analysed using SPSS v 24 to:

- i) Summarise the mean/standard deviation for demographics.
- ii) Compare Pain Score, Weight, Waterlow Score, Choke risk score, Sleep score in order to measure any effect from the use of night time positioning equipment at week 0 and week 12.

A detailed thematic analysis using Burnard's (1991) stepped analysis process was used to analyse the transcribed verbatim comments and feedback regarding effect of night-time positioning equipment on quality of life and activities of daily living. This stepped approach provides an opportunity to ensure a transparent and auditable account of the data analysis process.

Results

Quantitative

Out of the twelve participants who started the study, ten completed the trial. Participants age ranged from 51 – 89 years of age, with an average age of 79.6 years. Eight participants

were female whilst four were male. All the participants had co morbidities (Cerebrovascular Accident $n=6$; Dementia $n=4$). The equipment used and tolerated most frequently by the participants included: neck support pillow, horseshoe shaped temperature regulating pillow, soft fibre wedges (large and small) and sausage shaped pillow (*see figure 1*). IBM SPSS v24 was used to calculate the descriptive statistics. The results demonstrated that there was a mean increase in weight, an improvement in the mean sleep scores, and pain, Waterlow and choke scores decreased (*see table 1*).

Analysis from a paired samples T-test showed that there was a significant decrease pre and post-trial of NTPE on; pain score, Waterlow Score and choke score. There was a significant increase in sleep quality (*see table 2*).

Qualitative Analysis

On analysis of the qualitative data, recurring themes on the impact of equipment on resident participant's activities of daily living were identified as; sleep, posture, support, temperature, function, aesthetics and comfort.

Sleep

Sleep scores improved for 70% of the participants with no change reported by the remaining 30%. Participants were reported as sleeping longer for example "*so, he's having a better sleep and he's staying in a position supported because he rolls, so his posture is*

being improved” (Staff member- participant 9). The horseshoe pillows were of relevance to participant one as they assisted her to attain a comfortable sleeping position.

Posture

The use of NPTE had a clinical effect on 80% of the participants’ posture (*see figure 1*). Prior to the start of the study participants were using standard pillows. On completion of the study staff, and relatives reported positive outcomes on posture for example *“I think using the horseshoe has kept her straighter. Cos when it was just a pillow on that side her legs sort of migrated to the left” (staff member- participant 10).* *“... I think it’s straightening him more, instead of pushing his leg over” (relative- participant 9).*

Support

Support was a dominant feature of the feedback from participants, relatives and staff with 90% giving positive feedback. The comments concentrated around being able to lie and sit in better positions as the equipment supported their arms, shoulders and head which had the effect of stabilising the trunk thus preventing participants from leaning. *“For me, having the equipment has made life a lot easier, as before we would be packing them with cushions and pillows and things like that, whereas now we have the equipment, which is a lot better for them” (staff member-all participants).* Participant ten reported liking the lateral pillows and felt that they offered sufficient support, *“Oh yeah they really give me support yeah. And I think that’s quite sufficient”.* One piece of equipment was abandoned as the residents found it restrictive.

Pain

Descriptive statistics noted a reduction in pain scores, on further exploration it was reported by staff that there was a reduction in administration of analgesia which they ascribed to the continuous use of the equipment. *"...if someone's in pain we'll change the position and then we'll say 'do you want some paracetamol? Whereas now the equipment is doing that and saving the cost of paracetamol."* (staff member -participant one, participant ten).

Participant ten reported that the pain had decreased as a consequence of using the equipment under her knees.

Temperature

Participants varied in their responses regarding body temperature when using the equipment with 70% commenting about the warmth or heat. On questioning, participant seven replied *"It's ideal"* and participant one reported feeling *"nice and warm...not too warm"*. Three of the participants thought that the equipment made them feel too hot leading to equipment abandonment.

Function

The use of NTPE had a positive effect on participants ability to carry out daily living activities. On commencement of the study participant three was nursed in bed and required PEG feeding as she was unable to tolerate sitting out in her wheelchair due to postural asymmetry. After trialling the equipment, she was able to achieve a functional sitting position, enjoyed participating in activities in the lounge and was taking food orally.

This resulted in weight gain. The relative of participant seven reported that he had, *"...an opportunity to watch television and play dominoes"* which led to positive husband/wife interactions during visiting times, something that had diminished prior to the study. The impact of NTPE on participant nine was remarkable, prior to the study he relied on staff to feed him due to his inability to maintain an upright stable trunk. After using the equipment for the trial period, he was observed sitting upright feeding himself independently.

Aesthetics

All participants comments were favourable regarding the feel and look of the equipment with comments such as *"nice and soft"* (participant one) and *"ideal in shape and size"* (participant ten). As the fabric used for the equipment was made of terry towelling staff commented most older people could relate to it *"I think it's a nice fabric, the older generation are used to the flannelette sheets and I think in that respect it's better than a cotton fabric"* (staff member).

Comfort

Of the total number of participants 80% made comments relating to comfort with terms such as 'relaxation' and 'peace' used to clarify what this meant to them. Feeling *"calm and relaxed"* and *"...at peace with myself"* was the feedback from participant one. Comfort was attributed to quality of sleep for participant seven. Two participants found the equipment

too uncomfortable and abandoned its use. However, staff felt that *“if she’d had the softer laterals, I think she would have benefited more from that”* (staff member-participant 5).

Limitations

Twelve participants took part and although in a pilot study 10% of the sample population is deemed appropriate (Connelly, 2008) the results cannot be generalised to a wider population. Confounding variables such as the residents keeping the equipment on cessation of the study and the staff using the equipment when the researchers were not present cannot be excluded. The Hawthorne effect in relation to staff cannot be ruled out as this was the first study of its kind in a residential and nursing facility.

Discussion

The purpose of this small pilot study was to evaluate the effect of NTPE on an adult population residing in a care home facility. From the findings of this study there were considerable clinical effects of using NTPE on pain, sleep, weight, choke risk, Waterlow, food/fluid intake, depression score, medication, and analgesia intake. There were also notable effects on function, activities of daily living and quality of life. The evidence base to support the use of NTPE is founded on children’s studies only and is limited in the number of studies carried out (Blake et al., 2015). This has led to a call for further research in this area with a focus on the adult population to establish the value of NTPE. (Blake et al., 2015; Crawford & Stinson, 2015; Innocente, 2014). The effect on body systems and quality of life from the use of NTPE has already been documented (Goldsmith, 2000; Poutney et al., 2002; Lange and Waugh, 2004; Collins, 2007; Waugh, 2009; Waugh & Hill, 2009; Wynne &

Wickham, 2009; Hill & Goldsmith, 2010; Waugh & Hill, 2009; Innocente, 2014; Robertson et al., 2016) although a Cochrane systematic review found there was no effect on quality of sleep and pain reduction in children (Blake et al., 2015). However, it is important to recognise that this systematic review only reports on two randomised control trials (Underhill et al., 2012; Hill et al., 2009). Our study contributes to the findings by others excluded from Blake et al. (2015) review that NTPE does have an effect on body systems and quality of life (Dawson et al., 2013; Royden et al., 2013; Mol et al., 2012). This is demonstrated with all participants who completed the study varying in impact from decreased pain scores and analgesia intake to more profound effects, thus impacting on the overall Waterlow Risk Score. An example of this is one participant who was bed bound and PEG fed. She progressed to taking a normal diet orally and being able to participate socially within the care home in her wheelchair. This also corroborates the literature which asserts NTPE can have a positive effect on occupational performance (Innocente, 2014). The impact of NTPE on other activities of daily living and bodily functions were investigated by Hill et al. (2009) with children who have cerebral palsy. Bodily functions were measured overnight using polysomnography with and without NTPE. The researchers found no significant difference in sleep quality and variances between the children in oxygen saturation levels (increased and decreased). This differs to our findings where there was a significant difference in the participants quality of sleep. For NTPE to have a positive impact on posture, quality of life and bodily functions, perseverance and consistency in the use of the equipment is vital (Innocente, 2014; Hill & Goldsmith, 2012). In our study pieces of equipment that were perceived as generating too much heat or being restrictive were rejected.

Conclusion

This small-scale pilot study has sought to evaluate the impact of NTPE on the activities of daily living, posture and quality of life of adult residents living in an adult UK care home facility. The results found a significant difference between pre and post study scores for pain, quality of sleep, Waterlow and choke scores. A clinical effect was observed for posture, function, comfort, medication and nutritional intake. This study contributes to the urgent need for further empirical studies to determine how NTPE can be used to improve the quality of life of older people.

Implications for Practice

In this study the use of NTPE had a clinical effect on the posture and quality of life of the participants in the study.

A personalised and collaborative approach to 24-hour postural care that includes the use of NTPE can support older adult's health and wellbeing.

Education of staff in 24-hour postural care should include the assessment of postural asymmetry and its management when standing, sitting and lying.

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Recommendations

This study contributes to the urgent need for further empirical studies to determine how NTPE can be used to improve the quality of life of older people.

Conflict of Interest

This study was part funded by a grant from Simple Stuff Works

References

Abbey, J., Piller, N., De Bellis, A., Esterman, A., Parker, D., Giles, L., & Lowcay, B. (2004). The abbey pain scale: A 1- minute numerical indicator for people with end stage dementia.

International Journal of Palliative Nursing. 10(1), pp.6-14.

Blake, S. F., Logan, S., Humphreys, G., Matthews, J., Rogers, M., Thompson-Coon, J., Wyatt, K., & Morris, C. (2015). Sleep positioning systems for children with cerebral palsy. *The Cochrane Database of Systematic Reviews*. Issue 11. Art. No.: CD009257.

Burnard, P. (1991). A method of analysing interview transcripts in qualitative research. *Nurse Education Today*. 11(6), pp.461-466.

Buyse, D.J., Reynolds, III C.F., Mon, T.H., Berman, S.R., & Kupfer, D.J. (1988). The Pittsburgh sleep quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research*. 28, pp.193-213.

Cary, D., Collinson, R., Sterling, M., & Briffa, N.K. (2016). Examining the Relationship between Sleep Posture and Morning Spinal Symptoms in the Habitual Environment Using Infrared Cameras. *Journal of Sleep Disorders: Treatment and Care*. 5(2), pp.1-7.

Connelly L. M. (2008). Pilot studies. *Medsurg Nursing*. 17(6), pp. 411-2.

Crawford, S., & Stinson, M. (2015) *Management of 24hr-body positioning*. In Soderback, I., (Ed). *International Handbook of Occupational Therapy Interventions*. Springer: Switzerland.

Dawson, N. C., Padoa, K. A., Bucks, R. S., Allen, P., Evans, H., McCaughey, E., & Hill, C. M. (2013). Ventilatory function in children with severe motor disorders using night-time postural equipment. *Developmental Medicine & Child Neurology*, 55(8), pp.751-757.

De Brún, C. (2013). Finding the Evidence: A key step in the information production Process. The Information Standard. Retrieved from <https://www.england.nhs.uk/wp-content/.../tis-guide-finding-the-evidence-07nov.pdf>

Goldsmith, S. (2000) The Mansfield Project: Postural care at night within a community setting. *Physiotherapy*. 86(10), pp.529-534.

Hill, R. (1996) What sample size is “enough” in internet survey research? *Interpersonal Computing and Technology: An Electronic Journal for the 21st Century*, 6, pp.3-4.

Hill, S., & Goldsmith, J. (2010). Biomechanics and prevention of body shape distortion. *Tizard Learning Disability Review*. 2010; 15(2), pp.15-32.

Hill, C.M, Parker, R.C., Allen, P., Pau, A., & Padoa, K.A. (2009). Sleep quality and respiratory function in children with severe cerebral palsy using night-time postural equipment: a pilot study. *Acta Paediatrica*. 98(11), pp.1809–14.

Holmes, C., Brock, K., & Morgan, P. (2018). Postural asymmetry in non-ambulant adults with cerebral palsy: a scoping review. *Disability and Rehabilitation*.

Innocente, R. (2014). Night-time positioning equipment: A review of practices. *New Zealand Journal of Occupational Therapy*. 61(1), pp.13-19.

Isaac, S., and Michael, W. B. (1995). *Handbook in research and evaluation*. Educational and Industrial Testing Services. San Diego, CA.

Medical Research Council. MRC Ethics Guide. (2007). Medical research involving adults who cannot consent. Retrieved 8th February 2019 from <https://mrc.ukri.org/documents/pdf/medical-researchinvolving-adults-who-cannot-consent/>

NHS Purchasing & Supply Agency. (2009). Buyers Guide: night time postural management equipment for children. Centre for Evidence-based Purchasing: London.

National Institute for Healthcare Research. (2018). ENRICH: A toolkit for Care Home Research. Retrieved 8th February 2019 from <https://enrich.nihr.ac.uk/>

Polak, F., Clift, C., & Clift, L. (2009). *Buyers Guide: night time postural management equipment for children*. Centre for Evidence-based Purchasing: London.

Pountney, T., Mulcahy, C.M., Clarke, S., & Green, E.M. (2004). *The Chailey approach to postural management*. Chailey Heritage Clinical Services: UK.

Robertson, J., Baines, S., Emerson, E., & Hatton, C. (2018). Postural care for people with intellectual disabilities and severely impaired motor function: A scoping review. *Journal of Applied Research in Intellectual Disabilities*.31(suppl 1), pp.11-28.

Royal College of Nursing. (2011). *Informed consent in health and social care research*. RCN *Guidance for nurses*. 2nd Edition. RCN: London.

Royden, H., Mithyantha, R., Clarke, S., Birch, J., & Bassi, Z. (2013). Impact of Sleep Systems (SS) on Posture and Quality of Life (QOL) in Children with Neurological Disabilities Archives of Disease in Childhood. 98, pp.51-52.

Stephens, M., & Bartley, C. (2018) Evaluation of night time therapeutic positioning system for adults with complex postural problems. Accessed 8th February 2019
<https://usir.salford.ac.uk/>

Waterlow, J. (1988). The Waterlow Card for the prevention and management of pressure sores: towards a pocket policy. *Care Science Practice*. 6(1), pp.8–12.

Waugh, A., & Hill, S. (2009). Body shape distortion: promoting postural care at night.

Learning Disability Practice. 12(7), pp. 25-29.



Figure 1: Participant three pre, during and post 12-week trial.

Descriptive Statistics					
	N	Minimu m	Maximu m	Mean	Std. Deviation
weight before study kg	10	47.60	92.80	62.64	16.44
weight after study kg	10	41.60	101.40	63.33	18.90
Pain before study	10	.00	10.00	3.50	3.72
Pain after study	10	.00	5.00	1.60	2.37
Sleep score before study	10	8.00	14.00	11.40	2.32
Sleep score after study	10	4.00	12.00	9.60	2.63
Waterlow score before study	10	18.00	31.00	24.60	4.11
Waterlow score after study	10	17.00	29.00	23.10	3.78
Choke score before study	10	6.00	109.00	56.20	31.47
Choke score after study	10	6.00	91.00	50.60	29.15
Valid N (listwise)	10				

Table1: descriptive statistics, weight, pain, choke score, sleep, Waterlow.

		Paired Samples Test								
		Paired Differences								
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)	
					Lower	Upper				
Pair 1	weight before study kg - weight after study kg	-.69000	4.89068	1.54657	-4.18858	2.80858	-.446	9	.666	
Pair 2	Pain before study - Pain after study	1.90000	1.85293	.58595	.57450	3.22550	3.243	9	.010*	
Pair 3	Sleep score before study - Sleep score after study	1.80000	1.93218	.61101	.41780	3.18220	2.946	9	.016*	
Pair 4	Waterlow score before study - Waterlow score after study	1.50000	1.77951	.56273	.22701	2.77299	2.666	9	.026*	
Pair 5	Choke score before study - Choke score after study	5.60000	6.44981	2.03961	.98609	10.21391	2.746	9	.023*	

Table 2: Paired sample t-test of weight, pain score, sleep score, Waterlow Score and choke score. NB: * significant at $P < 0.05$

Title of the paper:

Impact of night time therapeutic positioning system for older adults in a residential care facility: a pilot study

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