

Dry weight from the haemodialysis patient perspective

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Abstract

Background: The concept of dry weight is central to fluid control in patients on haemodialysis (HD). Few studies have explored the concept from the patient perspective. Thus, the aim of the present study was to explore how patients on HD perceive the concept of dry weight and how they act in relation to it.

Methods: A purposive sample of 10 HD patients was interviewed once during a dialysis session in May–June 2009. The narratives were analysed using manifest qualitative content analysis.

Findings: The findings indicated that the concept was regarded as either an aid to securing treatment-related health, as indicating the fluid surplus volume or as a reminder of the daily fluid allotment. Some informants, however, did not report any specific perception. Plans for dealing with the perceptions were expressed in terms of using self-care strategies to control fluid balance, transferring responsibility to the HD team, and managing the physical consequences or social and psychological concerns.

Conclusion: Four ways in which HD patients perceived the dry weight concept were demonstrated. It is important that HD patients understand the significance of dry weight, both for their own wellbeing and for treatment adequacy. Prevalent misunderstandings about the dry weight concept have to be addressed by the dialysis team in order to prevent further suffering. By acknowledging the patient's perspective of the dry weight concept, the dialysis team could help the patient to successfully develop self-care strategies for dealing with the consequences of chronic renal failure.

Keywords

Dry weight, haemodialysis, qualitative content analysis, renal nursing, water-electrolyte balance.

Introduction

The concept of dry weight is central to fluid control in individuals receiving haemodialysis (HD). Limited sodium and fluid allowance together with removal of excess fluid by intradialytic ultrafiltration are cornerstones of fluid management in these individuals (Baraz *et al.*, 2010; Barnett *et al.*, 2008; Macheck *et al.*, 2010). Nursing care during ongoing HD aims to deliver a safe and evidence-based treatment. The treatment is monitored by the attending nurse and by comprehensive assessment and planning the occurrence of treatment-related complications could be prevented. The safe removal of excess fluid is primarily the responsibility of the nurse, and the dry weight enables the nurse to determine the amount of fluid required to be removed (Bradshaw *et al.*, 2011; Chamney, 2007; Dasselaar, 2007).

The term dry weight (also known as ideal weight or target weight) refers to the body weight at which there is no clinical evidence of fluid overload (Agarwal & Weir, 2010; Charra, 2007; Raimann *et al.*, 2008a). However, the definitions of dry weight have changed over time. The term was introduced in 1967 as a status characterised by “reduction of blood pressure to hypotensive levels during ultrafiltration and un-associated with other obvious causes” (Thomson *et al.*, 1967, p. 155). More rigorous definitions have evolved over time, and in 2009 the definition of dry weight is “the lowest tolerated postdialysis weight achieved via gradual change in postdialysis weight at which there are minimal signs or symptoms of hypovolaemia or hypervolaemia” (Sinha & Agarwal, 2009, p. 480). Although there have been numerous studies and debates on the definition (Agarwal & Weir, 2010; Raimann *et al.*, 2008a; Sinha & Agarwal, 2009) and assessment of dry weight (Agarwal & Weir, 2010;

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Dry weight from the haemodialysis patient perspective

Canaud & Lertdumrongluk, 2012; Raimann *et al.*, 2008b) as well as on the benefits of and barriers to achievement of dry weight (Agarwal & Weir, 2010; Canaud & Lertdumrongluk, 2012; Sinha, 2011), few studies have explored the concept from the perspective of the individual receiving HD. The lived experiences of individuals receiving HD, on the other hand, have widely been explored and findings from such qualitative studies have recently been synthesised. Bayhakki and Hatthakit (2012) report four themes in their meta-synthesis of lived experiences of individuals receiving HD: having a physical shackle in life; feeling mental and emotional distress; relying on an HD machine; and dealing with problems. The content in these themes are included in Fisher's (2004) model of thirst and drinking, which involve a myriad of physiological, psychological, behavioural, environmental, or nutritional factors that could influence the individual's fluid management perceptions and skills. Sinclair and Parker (2009) have described in more detail the meaning of fluid restriction along with an individual's perspectives of fluid management and these authors summarise the consequences of restricted fluids as a loss of function and loss of social activities. In addition, the strict diet and fluid regimen, strict scheduling of life-sustaining treatment sessions, limited income, and limited ability to travel (Clarkson & Robinson, 2010) as well as the complex medication regimen (Lindberg & Lindberg, 2008) are often described aspects of what it is like to be receiving HD. In the case of fluid management problems Aasen *et al.* (2012) have reported that patients feel powerless because their dry weight is determined solely by the renal care team rather than involving patients in a shared decision-making process (Aasen *et al.*, 2012). To better understand an individual's perspective, the aim of the present study was to explore how individuals receiving HD perceive the concept of dry weight and how they act in relation to it.

Method

Participants

A purposive sample of 10 individuals receiving in-centre HD was recruited from one dialysis unit at a hospital in Sweden. To be included in the study, the individual had to be 18 years of age or older; correctly orientated in time, place and in relation to themselves as a person; able to speak and understand spoken Swedish and they must have been receiving HD treatment for a period ≥ 12 months. The inclusion criteria were used to secure lawful age, cognitive and functional ability for sharing thoughts and having time for provision of HD treatment-related knowledge and treatment experience. In total, 27 individuals met the criteria; they were informed verbally and in writing about the planned study and 14 gave their informed consent to participate, although four potential participants were not interviewed due to an acute medical condition or patient transfer. Nine participants were men and one was a woman; their age range was 30–85 years; and their dialysis vintage range was 1–6 years.

Ethical considerations

The study was conducted according to the rules of the Helsinki Declaration (World Medical Association, 2008). A written enquiry was sent to the head of the department regarding the study protocol and approval was given. The participants were

given written and verbal information about the study and verbal informed consent to participate was obtained from each participant before scheduling the interview.

Data collection

The second (HBA) and third (RL) author conducted the 10 interviews at a time decided by the participant. Data collection took place during May–June 2009. Each participant was interviewed once during a dialysis session using a semi-structured, open-ended interview technique. The participants were asked to describe what they thought about the dry weight concept and how they act in relation to the dry weight. Follow-up questions, for example —“Can you explore that?” or “You mentioned ... what do you mean?” — were used when needed. Each interview was audio-taped and transcribed verbatim.

Data analysis

Before the process of analysis began, the interview transcripts were read through several times by all authors in order to get an overview. A manifest qualitative content analysis was chosen, building on the methodology described by Krippendorff (2004). However, the qualitative content analysis concepts were put into practice as suggested by Graneheim and Lundman (2004). The second and third author in addition to the last author, respectively, divided the transcribed text into two content areas: perception and action. ‘Units of analysis’ were marked in the transcribed material separately by each author. These units are parts of the interview and large enough to comprise a context for ‘meaning units’. The latter comprise words or sentences, extracted from the various units of analysis in the text, which correspond to the study aim. Each of these meaning units was then ‘condensed’, keeping in mind not to lose its core content, expressed in an abstract form, and labelled with a ‘code’. The codes were compared and sorted into ‘categories’ based on similarities and differences in a joint collaboration between the authors. The process of analysis involved a rigorous comparison moving back and forth between the whole text, the codes and the categories. The codes and categories were discussed by the authors until agreement was reached.

Findings

In the parts of the narratives that addressed ways in which the participants perceived the concept of dry weight, four categories were identified: *an aid; indicating excessive fluid; a reminder of fluid restriction; and no specific perception of dry weight.* An additional four categories were identified in the content area related to descriptions of the participants’ actions in regard to the dry weight concept: *using self-care strategies for control; transferring responsibility to the haemodialysis team; managing physical consequences; and managing social and psychological concerns.* The findings are structured by using the perception categories as headings while the participants described actions are embedded in the text. This way of structure was chosen because action categories are connected to more than one perception category. The connections between categories concerning the nature of the participants’ perceptions and reported actions are depicted in Figure 1. Representative excerpts from the interviews are presented.

Dry weight from the haemodialysis patient perspective

An aid

The dry weight concept was either seen as a personal aid for managing fluid balance or as an aid to the dialysis team to restore fluid balance. Participants clearly described that maintaining dry weight helps in ensuring a comfortable dialysis session with optimal fluid removal and prevents adverse reactions to treatment, such as hypotension, cramps and dizziness. Moreover, the dry weight concept was experienced as securing wellbeing and good health between sessions because with the aid it was possible to evaluate current fluid status and thereby experiencing self-control. The narratives also included descriptions on how the dialysis team uses the dry weight to calculate fluid overload and determine the amount of fluid required to be removed.

“... well [dry weight] means the combination of blood pressure and weight ... it’s just a target and really it’s only your blood pressure that matters. Dry weight is an aid.” (I10)

“I come to dialysis and then they [the staff] figure out how much I’m over my dry weight” (I9)

The dry weight as an aid was included in various self-care strategies used by the participants for personal control of food and fluid intake, as well as in physical activity and for shared decision-making regarding dialysis treatment scheduling. Choosing foods with low salt and fluid content, measuring fluid intake and weight gain, being economical with fluid before exercising, and considering one’s dialysis scheduling in fluid intake situations were described.

“So I check it [fluid balance] by weighing myself at home too. So I see how much it’s increased [from the dry weight].” (I8)

Indicating excessive fluid

In contrast to participants’ perception of the dry weight as an aid, the dry weight concept was perceived as only indicating the fluid surplus that had to be removed during dialysis. Removal of excessive fluid was regarded as necessary in light of the risk of renal failure. The narratives described difficulties in

understanding the concept of dry weight, although it was clearly connected to the removal of excess fluid using intradialytic ultrafiltration.

“You have to remove the fluid ... because you have a lot of excess fluid in your body. It’s excess fluid you accumulate that you wouldn’t have if you were healthy.” (I7)

The participants described some participation in deciding on fluid removal volume and monitoring vital parameters such as blood pressure. However, they left it to the dialysis team to be responsible for achieving the normovolaemic goal. Management of the physical consequences of intradialytic ultrafiltration such as cramps, hypotension and long-term dizziness was expressed as actions that had to be taken and as concerns that prevented further fluid removal. The physical consequences were also expressed as having a negative impact on life.

“I’ve started doing a few things myself. Taking my blood pressure and trying to tell them [the staff] how much they should remove... I start getting cramps almost but still they [the staff] say there’s more fluid to remove” (I7)

“I can’t remove too much... because my blood pressure drops. Then I don’t dare remove more. If I eat then my blood pressure drops immediately. Then it stays there the next day.” (I1)

A fluid restriction reminder

Another way to perceive the dry weight was that the concept worked as a reminder of fluid restrictions. A certain psychological strain was also present in the narratives, expressed as feelings of guilt for having consumed more fluid than one is allowed. Being able to restrict fluid intake was described as a behavioural challenge, especially in social activities, taking medicines, and in thirst sensation owing to physical imbalances or seasonal variation in outdoor temperature. Furthermore, the participants’ experiences of cramps, hypotensive episodes, coughing or breathing difficulties cognitively reinforced the notion of dry weight as a fluid restriction reminder. In the efforts trying to maintain a low fluid intake, the dry weight

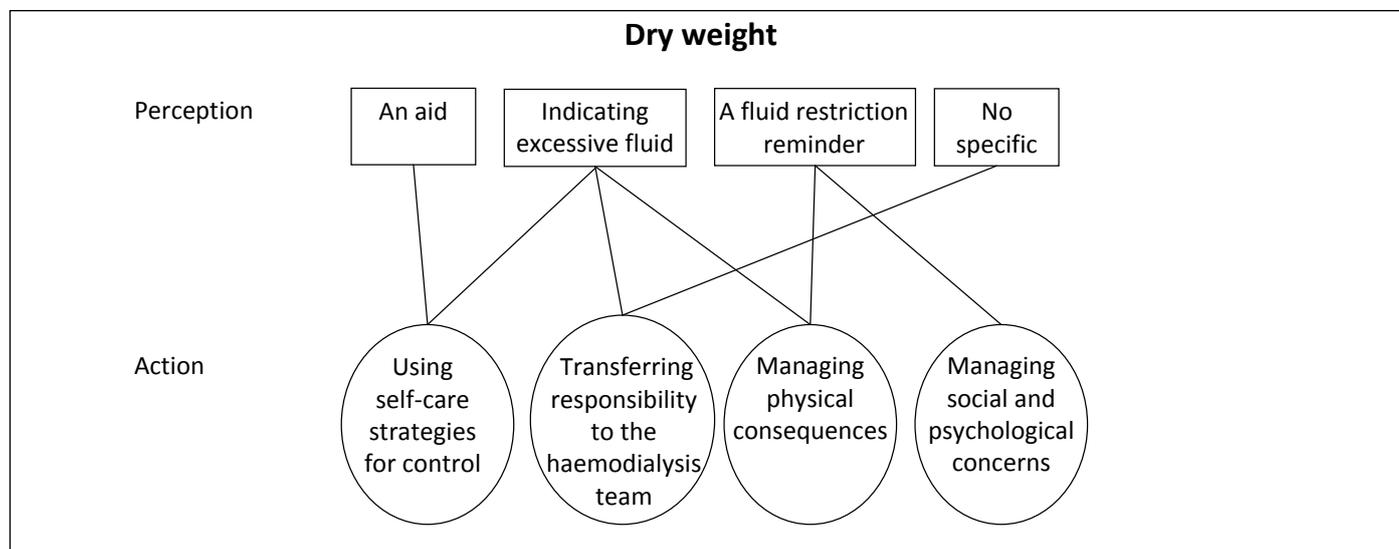


Figure 1: Categories of the different ways in which individuals receiving HD perceived the concept of dry weight (rectangles) and categories of how the individuals acted in regard to the concept (ellipses). The lines indicate connections between the nature of and reported actions.

Dry weight from the haemodialysis patient perspective

caused participants to think about and estimate hidden fluid in foods.

“I think about not drinking too much ... when people offer you coffee all the time ... many ask if I want a beer. That’s a half-litre extra. I probably refuse about two litres a day.” (I6)

“Problems ... it’s very hard when you’re thirsty ... it’s impossible. I can’t learn it ... as soon as I touch something I think about fluids. If you eat ice cream or something else, how much fluid does this contain ...” (I4)

No specific perception of dry weight

Some of the participants did not have any specific thoughts about the dry weight concept, which they reported did not affect them and was thus nothing to which they had to pay attention. If anything, the concept was regarded as something used by the HD team when delivering HD treatment.

“... I don’t think about dry weight...//... I guess it’s some weight you should be at that they [the staff] are interested in.” (I3)

“The people at the hospital claim that dry weight is what I’d be if I were completely healthy. I must say I don’t go around thinking about it.” (I5)

Discussion

The participants’ narratives about the dry weight concept indicated that the concept was regarded as either an aid to securing treatment-related health, as indicating the fluid surplus volume, or as a reminder of the daily fluid allowance. Some participants, however, did not feel they had to pay attention to the concept and therefore had no specific perception to report. Furthermore, the narratives included descriptions of how the participants acted in relation to dry weight. Plans for dealing with the perceptions were expressed in terms of using self-care strategies to control fluid balance, transferring responsibility to the HD team, and managing the physical consequences or social and psychological concerns.

Accordingly, the present findings distinguish between four ways in which the participants perceived the dry weight concept. Whether these perceptions are related to the participants’ fluid management skills, treatment experiences, health state, or social support is unclear, because the present exploratory study cannot shed light on this aspect as it was not included in the study protocol. In theory (Forbes & While, 2009), however, it is tempting to suggest that HD patients’ thoughts about the dry weight concept may affect their skills and thus may need to be taken into account in patient education, focusing on fluid management (Baraz *et al.*, 2010; Barnett *et al.*, 2008; Welch & Thomas-Hawkins, 2005). It is described that health information tailored to patients’ thoughts, knowledge and skills should increase the likelihood of improving self-care (Lorig *et al.*, 2001). However, to date, no prospective trials have been conducted to evaluate the educational effects of tailoring fluid management education to patients’ individual perceptions of the dry weight concept.

Successful self-care requires that patients be allowed to participate in care, that they have the necessary knowledge and skills and that they be allowed to make decisions regarding their care on the basis of personal observations and goals (Lorig & Holman, 2003; Richard, 2006). Interestingly, dry weight was described as helping participants optimise their own wellbeing in daily life. As the dialysis team has a duty to contribute to the health and wellbeing of the patients they need to have knowledge about the patients’ perspective on treatment-related concepts. Such knowledge is necessary in team activities aimed at helping patients develop positive self-care behaviours. Consequently, the commonly used educational strategies such as one-to-one teaching providing an adequate knowledge foundation on food choices or verbal instruction and regular face-to-face reminders emphasising sodium and fluid restriction on self-care activities (Baraz *et al.*, 2010; Barnett *et al.*, 2008), might need to be adjusted to acknowledge the patient’s perspective. Thus, the patient’s perspective of the dry weight concept might enable successful development of self-care strategies for dealing with the consequences of end-stage kidney disease. Moreover, the dry weight was perceived as a valuable tool in daily living and not, as expected, only for achieving dialysis treatment goals, that is, for enabling calculation of fluid overload (Machek *et al.*, 2010).

In contrast, the perception of dry weight as the amount of excess fluid does not imply an understanding of the concept’s possible contribution to a self-controlled fluid management. Such perception may become a psychological burden for individuals receiving HD and if it is not appropriately managed the burden will develop into mental and emotional distress. The dialysis team are well positioned to help patients develop and enhance their coping and self-care strategies for dealing with experienced problems (Bayhakki & Hatthakit, 2012). Therefore, care settings practising a person-centred care philosophy and patient participation should address misunderstandings about the dry weight concept by using information adapted to each individual’s needs.

In some cases, dry weight was described as only being useful to the dialysis team (Bradshaw *et al.*, 2011; Dasselaar, 2007), implying that the participants themselves did not pay any attention to it. The latter could be interpreted as indicating that patients are uninvolved in dialysis care or that a dialogue about shared decision-making is lacking. Research has shown that, without dialogue, patient participation can not exist (Thompson, 2007). Similarly, lack of dialogue could also reflect a paternalistic model of the patient–dialysis team relationship, as the narrative describes a passive care recipient for whom all decisions rely entirely on the knowledge of the dialysis team. Moreover, the level of knowledge about HD-related concepts and treatment procedures influences how patients view, perceive and act to treatment. The patient’s provision of knowledge is necessary for shared decision-making and the dialysis team have the responsibility to improve the patient’s knowledge (Bayhakki & Hatthakit, 2012). Still, Aasen *et al.* (2012) described that HD patients’ feel that the dialysis team exercise their power and dominance and that they themselves have to fight for shared decision-making. Consequently, from a health care perspective, it is important that HD patients understand the significance

of dry weight, both for their own wellbeing and for treatment adequacy. To succeed in patient education work and achieve patient participation in everyday practice, the dialysis team must consider the patient as a person who can learn, and be aware of the team's own competence and willingness to identify the patient's learning needs and to identify and implement adequate educational strategies (Friberg *et al.*, 2012).

A perception that equates dry weight with fluid restriction was shown in the present findings. Such thinking is known to impact on HD patients' social life, as it is consistently associated with loss of social interaction as a consequence of minimising social triggers of fluid consumption (Fisher, 2004; Sinclair & Parker, 2009). Just as in earlier studies (Clarkson & Robinson, 2010; Lindberg & Lindberg, 2008; Sinclair & Parker, 2009), participants in the present study described the behavioural challenges associated with restricting sodium and fluid intake. A daily intake of 80–110 mmol sodium and a half-litre of fluid, plus an individual amount corresponding to the 24-hour urine volume is generally recommended (Ash *et al.*, 2006). The participants' self-care strategies for controlling fluid balance involved choosing healthier foods and fluid alternatives compatible with their medical condition.

Trustworthiness

The interrelated concepts credibility, dependability and transferability are commonly used when evaluating qualitative study procedures (Graneheim & Lundman, 2004). To achieve credibility (Graneheim & Lundman, 2004) several aspects were considered. A purposive sampling procedure was performed to include informants with various experiences of HD treatment. The number of participants in the study was regarded as sufficient (Sandelowski 1995), and all participants contributed to the findings. Sampling bias may have played a role, as only one woman was included in the sample and this could reduce the trustworthiness of the findings. This is unlikely, however, as there are no theoretical assumptions indicating gender differences in how HD patients perceive treatment-related concepts. Moreover, the perceptions expressed by the one woman included in the present study are also present in the men's narratives and vice versa. On the whole we did not see any potential gender bias in the sample. To strengthen dependability (Graneheim & Lundman, 2004), an open dialogue among the authors regarding the content of the analysis was continued over time. The planned study design was sustained during the entire analysis process, and data collection was conducted within a limited time frame. Furthermore, the use of a semi-structured interview guide guaranteed that the probed questions covered the study-specific area. Because the interviews were open-ended, the participants could freely share their perceptions. It also enabled the interviewer to explore and probe the research area to enhance the quality of the self-reported data (Polit & Beck, 2012). Accordingly, tailored follow-up questions were used in the interviews. To help the reader decide whether the findings are transferable to other dialysis settings or groups (Graneheim & Lundman, 2004), the data collection methods and analysis process used in the study have been well defined in the present article. The illustrative excerpts presented in the findings increase transferability, although it is up to each reader to make the final judgement.

Conclusion

Four ways in which HD patients perceived the dry weight concept were demonstrated. It is important that HD patients understand the significance of dry weight, both for their own wellbeing and for treatment adequacy. Prevalent misunderstandings about the dry weight concept have to be addressed by the dialysis team in order to prevent further suffering. By acknowledging the patient's perspective of the dry weight concept, the dialysis team could help the patient to successfully develop self-care strategies for dealing with the consequences of end-stage kidney disease. However, prospective trials need to be developed to evaluate the educational effects of tailoring fluid management education to patient's individual perception of the dry weight concept.

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Dry weight from the haemodialysis patient perspective

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