

WHY NUTRITIONAL KNOWLEDGE MAY NOT INFLUENCE DIETARY BEHAVIOUR

Abstract

Despite the increasing reliance on nutritional knowledge by health campaigns, research investigating its correlation with dietary behaviour continues to generate conflicting findings. The reason for this variation may not be sufficiently explainable by sociodemographic differences between study subjects. Instead, it has largely arisen due to limited understanding and poor application of the subject- nutritional knowledge with regards to its domains, forms and level.

Keywords: Nutrition, nutritional knowledge, dietary behaviour

Background

Nutrition is generally described as the process of intake and utilization of nutrients in the body. This process guarantees the intake of nutrients for the maintenance of health, otherwise malnutrition ensues (1). The problem of malnutrition is faced by about one billion people worldwide, who are at increased risk of impaired immune function and increased susceptibility to disease, impaired physical functioning and reduced productivity (2). It is hence necessary to ensure adequate nutrition, although may prove challenging without knowledge of the required nutrients. Such knowledge is necessary to guide the understanding and application of sound nutrition principles termed, nutritional knowledge (3).

Nutritional Knowledge

Nutritional knowledge can be described as the understanding of nutrients and nutrition, a framework upon which facts are based (4). It refers to knowledge of the scope of nutrition, and like knowledge generally, it enables an individual make meaning of an aspect, meeting the need for cognitive consistency and predictability (5). An example in this context is, knowing that a food group such as carbohydrates are energy sources. Such knowledge can guide an individual towards the intake of

carbohydrates to derive energy. In other words, nutritional knowledge is critical for ensuring adequate nutrition, particularly regarding dietary intake.

That said, it becomes vital to understand the aspects which constitute nutritional knowledge. Previous research makes it obvious the aspects considered to be a part of nutritional knowledge. Steenhuis, et al (6) for instance focused on the knowledge of fat, while Resnicow, et al (7) emphasised the knowledge of fat, fibre and cholesterol. Anderson, et al (8) in their research considered familiarity with nutrition terms, knowledge about current dietary recommendations, and the practical applications of these recommendations as comprising the domains of nutritional knowledge. Apparently, these knowledge areas are crucial, however seem to represent only a limited aspect of nutritional knowledge. Parmenter and Wardle (9) and in a revised version (10) have rather recommended four aspects as comprising the full domain of nutritional knowledge; dietary recommendations, sources of nutrients, choosing everyday foods, diet and disease relationship. These aspects are more comprehensive than those fore-mentioned and reflect a broader scope of nutritional knowledge, necessary for appropriate assessment of the subject, and in consonance with the psychometric criteria which ensures that scaling of psychological attributes includes the full domain of the attribute in question (11).

Conceptualising nutritional knowledge, Wansink, Westegren and Cheney (12) assert that nutritional knowledge consists of a hierarchy of two forms; knowledge relating to the attributes of food and that regarding the consequences of consuming food. Another study (13) describes two forms of nutritional knowledge; knowledge of nutrient functions and knowledge of nutrient sources. Obviously, the knowledge forms indicated in both studies represent the knowledge of nutrition facts, which may be termed as declarative knowledge. Worsely (4) recognizes this form of knowledge though asserts that nutritional knowledge may as well occur as procedural knowledge. While declarative knowledge describes the knowledge of facts and information, procedural knowledge refers to the knowledge of how to perform certain tasks. For instance, knowing that glucose is a source of energy is declarative knowledge. On the other hand, knowing how to choose fresh leafy vegetable, rather than high-fat food product is procedural knowledge. Bruning, Schraw and Ronning (14) claim that declarative knowledge exists before, and is translated into procedural knowledge. Thus, to consciously choose a healthier snack, one needs to have knowledge of what makes it healthier than other alternatives

(declarative knowledge), which can prompt choices requiring the know-how (procedural knowledge).

The Role of Nutritional Knowledge in Dietary Behaviour

The subject of nutritional knowledge has attracted a great deal of attention lately, evidenced in its frequent use in health campaign **strategies to influence dietary behaviour** necessitated by the present nutrition transition (15,16). To a large extent, this has been supported by studies attesting to the influence of nutritional knowledge on dietary behaviour (17,18,19,20), **while other researchers have queried the strength of this association (21,22)**. Assuming a unique view, Worsely (4) claims that nutritional knowledge is necessary but insufficient to influence dietary behaviour. These disparate views create pockets of skepticism regarding leveraging nutritional knowledge to influence dietary behaviour in health interventions. **Given the doubt, other factors influencing dietary behaviour have been proposed**. Baranowski, Cullen and Baranowski (23) for instance, posit that factors such as perceived consequences of behaviour, beliefs and attitudes, skills, confidence and motivators influence dietary behaviour. Although they also acknowledge the role of nutritional knowledge, they seem to agree with the views of Worsely (4) regarding the strength of its influence. Considering that nutritional knowledge may not be the only factor able to influence dietary behaviour, their claim is plausible but appears to undermine the full implication of nutritional knowledge.

A critical consideration of the factors proposed by Baranowski, Cullen and Baranowski (23) reveals that they are fundamentally reliant upon nutritional knowledge (or are inseparable from). For instance, the perceived consequences of engaging in the dietary behaviour stressed by the health belief model and theory of planned behaviour (24), describes what the perpetuator stands to gain or risk by the behaviour. Regardless of how accurate, such perceived consequences are usually subject to some level of knowledge gained through information. It is this knowledge that plays the key role in shaping perception (25). Furthermore, knowledge of certain kind (procedural knowledge) may also equip with skill required to perform a particular behaviour (4) and help to reinforce confidence at performing a task.⁽²⁶⁾ Other factors highlighted by the model include **“motivators” existing in** form of biological needs, social influences, environmental benefits, psychogenic needs, personal and cultural values defining the moral climate surrounding the perpetuation of a certain behaviour. Such **motivators reflect individuals’** shared beliefs (27),

which are related to individuals' knowledge. The concepts of belief and knowledge though contrast in terms of mental representation, are closely related. While knowledge refers to the representation of a proposition, belief is the representation of a truth-value associated with a proposition (28). In other words, belief is knowledge accepted based on how truthful it is considered to be. This implies that individuals' beliefs are dependent on their knowledge. That said, nutritional knowledge may be considered as the framework upon which other factors influencing dietary behaviour are built or based. If nutritional knowledge is accepted as such, it bears some reassessment to provide some understanding as to why its role in dietary behaviour has remained unrecognised in some studies.

Critical Issues in Understanding and Applying Nutritional Knowledge

Some factors which may limit the influence of nutritional knowledge on dietary behaviour are; poor conceptualisation of nutritional knowledge, variations in information source characteristics and the level of knowledge. These factors are discussed in more detail.

1. A major problem associated with applying nutritional knowledge is its poor conceptualisation. A balanced assessment of nutritional knowledge should embrace all the qualities of nutritional knowledge in terms of type and scope. Regarding scope, nutritional knowledge may consist of domains. These domains have already been described in detail by Parmenter and Wardle (9) to include; "Dietary Recommendations", "Diet and Disease Relationship", "Sources of Nutrients", "Choosing Everyday Foods." The authors have also claimed that all the aspects considered together constitute comprehensive nutritional knowledge. Actually, this broad classification has significantly improved the research into the subject of nutritional knowledge; however seems to have failed to address knowledge related to the manner or pattern of food intake (frequency and regularity) among the named domains. Meal frequency and regularity are becoming increasingly studied due to their impact on body metabolism and health. For instance, consuming small frequent meals is suggested to promote fat loss (29,30,31) by physiological mechanisms such as improved glucose homeostasis, (32,33) increased thermic effect of food (34) and appetite control (35,36). More so, since Brobeck (37) proposed irregular meals to enhance adipose deposition due to induced low thermic effect of food, more recent studies have observed the effect of time of food intake on the circadian rhythm in peripheral tissues (38,39). Studies (40,41) reveal that when humans engage in

alternate day fasting or energy restriction they show increased insulin sensitivity, reduced insulin and leptin **secretion, increased** mobilisation of fatty acids and increase ketones. The raised insulin **sensitivity in this** manner can result in weight loss (42). Thus, having knowledge of healthy nutrient intake patterns is critical.

Another misconception of the subject of nutritional knowledge has occurred due to limited insight into domain-specific characteristics. In a review, Alexander and Judy (43) state that in addition to procedural and declarative knowledge, domain specific knowledge consists of conditional knowledge. Conditional knowledge involves an understanding of the time and place to access necessary facts and apply specific procedures. This form of knowledge was recognised by earlier theories (44,45), however appears to have been undermined in nutritional knowledge research. Knowing the facts (declarative) and how to apply the facts **(procedural) are important**, but may not guarantee successful application of such knowledge if the individual in question does not know when to apply it **(conditional knowledge)**. A hierarchical arrangement of the forms of nutritional knowledge as suggested by Wansink, Westegren and Cheney (12) would place conditional knowledge as the third level knowledge; regulating the application and use of other knowledge forms.

Neglect of conditional knowledge is likely to be the problem associated with translating declarative to procedural knowledge. Although Worsely (4) also noted the limited translatability from declarative to procedural knowledge, failed to acknowledge the absence of conditional knowledge as a possible cause. From a biological standpoint, dietary behaviour like any other behaviour may viewed as a conscious response to an occasion presenting with a task. This can be deduced from **Bergner's review (46)** on the attributes of behaviour. For successful accomplishment of the task, the individual needs to know the facts regarding the task (declarative), how to accomplish the task (procedural) and if the situation or occasion demands the application of the facts and skills gained. Agreeably, their judgement regarding whether or not to apply their facts and skills in certain occasions may not be accurate based on health standards, but should not be undermined since it guides their response to the task expressed as behaviour.

2. Notwithstanding the necessity of the three forms of knowledge, an individual may yet fail to successfully perpetuate specific dietary behaviours due to inaccurate nutritional knowledge gained from invalid sources. For instance, an individual who imbibes **information on the** harmfulness of certain foods is likely to be skewed

against consuming such foods. Similarly, erroneous information regarding nutrient facts can lead to poor understanding and misuse of nutrient labels. The expanding interest in the role of food, health and wellbeing and consumers' need for nutrition information appears to have been matched with a corresponding increase in the volume of nutritional information from a variety of sources. Consequently, it has become challenging discerning the veracity of nutrition information. Since nutritional knowledge is gained through nutritional information (47,48) it stresses the need for reliance on valid sources. Inconsistent quality of nutritional information from media sources such as television news has already been highlighted (49,50). Diane et al (48) suggests this may be consequent upon the focus on recent dramatic and sensational news highlights rather than established guidelines for dietary moderation and diversity. As regards other sources such as the internet, newspapers and magazines, the reported variability of nutritional information and predominance of non-evidence based nutritional information has been accrued to difficulties in relating complex nutritional information by inadequately trained news reporters (51,52). Regardless of the rationale, there is need to ensure the use of valid nutrition information as it is key in shaping nutritional knowledge and dietary behaviour.

3. A critical aspect which can moderate the association between nutritional knowledge and dietary behaviour but apparently undermined in nutrition research is the level of knowledge. The term "level of knowledge" is oftentimes used in educational research literature to imply the extent of knowledge; how much of a subject a person knows. Jong and Fergusson-Hessler (53) categorises knowledge based on levels - deep and superficial levels. Knowledge is described as deep when information gained has been understood, and translated into basic concepts, principles relating to the domain. Glasser (54) asserts such knowledge does not occur as in the original information used, and associated with critical evaluation and judgment. Superficial knowledge on the other hand lacks critical judgment, and occurs as an exact replica of the original information – as that which is a product of rote-learning (54). Nutritional knowledge may be understood to exist similarly, with those of a deep level of knowledge being more apt to perpetuate dietary behaviours related to the knowledge gained.

The difference between the deep and superficial knowledge levels perhaps is due to differences in individual ability to structure learned information. Addressing evidence on the structure of knowledge in an early research, Larkin, et al (55) concludes that individuals' understanding of information varied according to their

ability to chunk information into meaningful small units. Elio and Scharf (56) observe that structuring knowledge in this manner helps for quick and efficient processing. Thus, given the same scope of nutritional knowledge, the level of knowledge may differ influencing one's ability to perpetuate a particular dietary behaviour. Nutritional knowledge research should consider investigating subjects' level of nutritional knowledge in relation to dietary behaviour.

Figure 1. below shows an illustration of specific components of the critical aspects of nutritional knowledge.

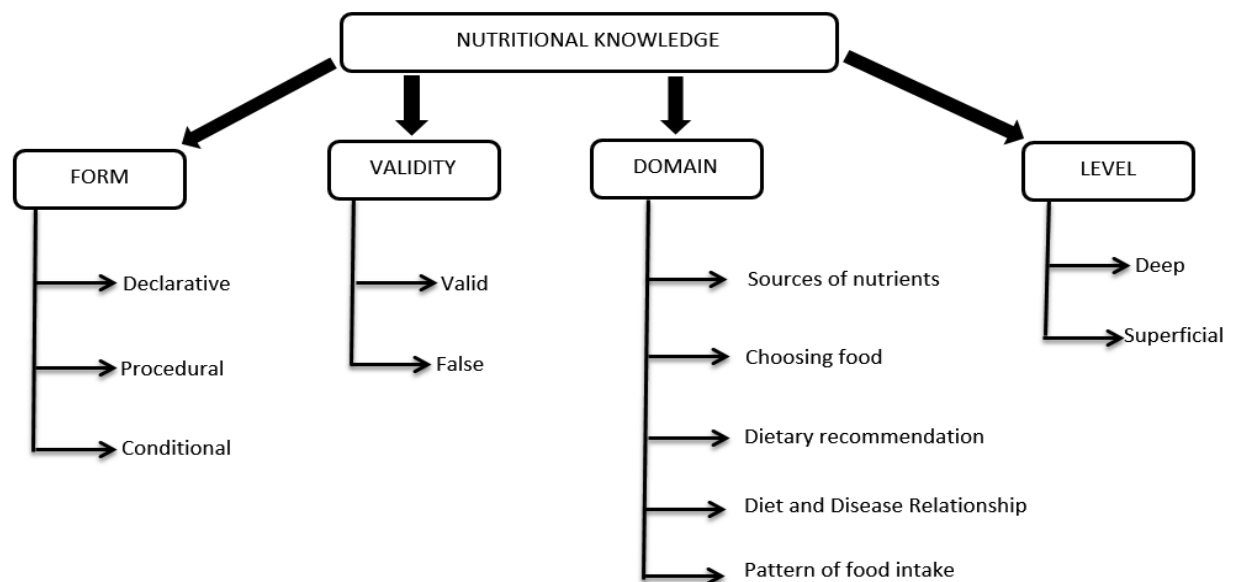


Figure 1. Components of Comprehensive Nutritional Knowledge.

Conclusion

In this review, nutrition information is recognised as the source of nutritional knowledge which plays a fundamental role in individuals' dietary behaviour. Although it is well acknowledged that other factors may influence dietary behaviour as well, clarity on the influence of nutritional knowledge on dietary behaviour can only be gained when nutritional knowledge is considered in the fullness of its characteristics- form, validity, domain and level. Thus, nutrition education campaigns may need to re-strategise, modifying the scope and quality of nutritional knowledge employed. More research is needed to explain the impact of varying

forms, domains and levels of nutritional knowledge on the different dietary behaviours.

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