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GUEST EDITORIAL

Nutrition screening: science behind simplicity

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Nutrition screening triggers entry into the nutrition care process.[1] Screening has informally been described as simple, quick or low-intensity proxy for more complex procedures. More formal definitions for the nutrition setting have been proposed, describing nutrition screening as a process of identifying patients, clients, or groups who may be at risk of malnutrition or may already be malnourished to determine if a detailed nutrition assessment is indicated.[2] Nutrition screening can rely on anthropometric, dietary, clinical and/or biochemical parameters, can be "general" in nature or focus on a particular aspect of nutritional status, intended for a specific target group and/or context. One of the most important characteristics of a screening tool is its cost-effectiveness, i.e. whether it is able to adequately achieve its aim with the least resources. To determine whether the intended aim is achieved, the screening tool's findings are typically compared to those of a comprehensive nutrition assessment, a technique called comparative or relative validation.[3]

Whilst not explicitly indicated as such, an article in this edition of the SAJCN[4] by John, Ocheke, Diala, et al. determined, amongst others, the classification agreement between mid-upper arm circumference (MUAC) (i.e. a single anthropometric measurement) and various other anthropometric indicators (i.e. z-scores of weight for height, body mass index for age and MUAC) of acute malnutrition in Nigerian young children.

On the surface, validation appears straight forward. In good scientific practice at least three matters need to be considered when a nutrition screening tool (the index test[5] or test method) is compared to a detailed nutrition assessment (the reference standard[5]/method).

First and foremost, the aim of the screening tool has to be specified. In the relatively young science of human nutrition, imprecise language usage is still common. Generic terms such as "nutritional status" and "malnutrition" may soon be too vague. Overnutrition/obesity and micronutrient deficiencies – clearly important forms of malnutrition in societies such as South Africa[6] – may very well be the focus of a screening tool(s). Furthermore, the primary use and clinical role of a screening tool should be specified[5]: is it to be used only for once-off classification into "at risk" or "not at risk", or will it also be used for comparing, ranking or monitoring individuals or groups (i.e. for evaluative purposes),[7] or predicting clinical outcomes, such as length of hospital stay or the development of complications?[8] The target group and setting for which a screening tool is intended, need to be outlined. Clearly screening for geriatric oncology patients in an urban hospital of an industrialised country differs from that to be used among illiterate caregivers of pre-schoolers in a resource-limited rural community. Except when a screening tool exclusively relies on objective measurements (e.g. anthropometry as in the article by John, Ocheke, Diala, et al.[4]), practical language, format and administration-related matters (e.g. self- vs interviewer- vs digital administration) need to be clarified. One size does not fit all,[8] and validity is not transferable to non-comparable use.

Second, the reference standard has to be relevant and clearly conceptualised/justified and operationalised. This means that the aims of the screening tool and the detailed nutrition assessment used for the comparison must be aligned. To support clear conceptualisation, a strong movement towards standardised terminology in nutrition care is gaining momentum internationally for different contexts [9,10,11] even though general consensus has not been reached,[12] and the relevance in developing countries and in community settings may need to be further debated. A major, and still largely unresolved, challenge refers to the operationalisation of a detailed nutrition assessment (that may consist of various indices) into a final answer or "score" that can be meaningfully compared to the outcome of the screening tool. Whilst nutrition professionals generally agree that a detailed nutrition assessment involves combining multiple parameters from anthropometric, clinical, dietary and/or biochemical methods,[13] exactly what constitutes a "criterion", and in particular the cut-off or result categories for a positive outcome, remains a point of debate. To add to this, the differentiation between nutrition screening and detailed assessment has become blurred.[2]

The third main point to consider when judging the performance (i.e. diagnostic accuracy) of a screening tool refers to the statistical techniques used in the analysis.

Numerous methods for estimating or comparing diagnostic accuracy are available. The validity, for example, of screening tools with a dichotomous (i.e. "at risk" vs "not at risk") outcome can be calculated and described in terms of its sensitivity, specificity, and positive and negative predictive values. This is contained in the STARD guidelines for reporting diagnostic accuracy studies in general,[5] and also for nutrition-related research of this nature.[2,3] Researchers and readers of validation studies must understand the meaning and implications of the measures of validity for practice. A final consideration relates to the reliability (i.e. repeatability/stability) of a screening tool: reliability remains a prerequisite for validity, and this is also true for all screening tools – a screening result without test-retest consistency cannot be valid.

Since screening relies on quick and easy methods, it justifiably becomes increasingly popular in all health care settings. The development and validation of screening tools is, however, complex albeit indispensable for evidence-based and fair referral to detailed nutrition assessment and care. Development may be guided by a critical analysis of the many screening tools available [8,14-18] before adjusting and validating for the local context and need. Any qualified heath professional should be able to use a screening tool, but nutrition professionals have to take responsibility for the development and validation thereof. Evidence linking nutrition screening and assessment results to health outcomes (i.e. criterion and predictive validity) should be the next deciding factor and is also much needed in South Africa.

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