

Beneficial Changes Network

Case study

Bournemouth University

The Nutrition Wheel: an interactive tool to identify malnutrition in older people in the community

Summary

The Nutrition Wheel is an interactive tool which can be used as a conversation starter to help identify if an older person is at risk of malnutrition (as undernutrition) at an early stage. It provides guidance, advice and signposting to further information, and support on next steps. It is inexpensive, easy-to use and can be used by anyone who supports or cares for an older person. This includes voluntary sector, care homes and other community organisations.

Given the continued and rapidly growing problem of malnutrition across Dorset (and nationally), the Nutrition Wheel was developed in a collaborative way with the aim of preventing malnutrition in older people. Through intervention at an early stage, signposting to support, and appropriate treatment and management, this tool shows that the benefits of treating malnutrition far outweigh the costs.



Background

The National Institute for Health and Care Excellence defines a person as being malnourished if they have:

- *A body mass index (BMI) of less than 18.5 kg/m²*
- *Unintentional weight loss greater than 10% within the past three to six months*
- *A BMI of less than 20kg/m² and unintentional weight loss greater than 5% within the past three to six months.*

The majority of malnutrition (93%) (as undernutrition) in older adults originates in the community and has been compounded by the emergence of COVID-19. Before the pandemic, malnutrition was already a huge issue, affecting 1.3 million people over the age of 65 in the UK, representing one in 10 older people, resulting from medical (disease-related), physical and social factors that are often interlinked.¹

Malnutrition has significant consequences for older people and for health and social care services. Malnutrition is associated with increased risk of frailty, sarcopenia (loss of muscle function and strength), falls, dependence in activities of daily living, hospital admissions and longer length of stay, with poor wound healing and more complications, increased mortality and poor health-related quality of life. (Maybe bullet point these?) Malnutrition is largely preventable and treatable but remains under-detected, under-treated and under-resourced, and can be overlooked by those working with and for older people in the community.

Given the continued and rapidly growing problem of malnutrition across Dorset (and nationally), the 'Nutrition Wheel' was developed as a novel interactive tool to help identify risk of malnutrition (as undernutrition) in older people in the community and provide appropriate nutritional guidance and signposting. The 'Nutrition Wheel', is a simple tool that has been validated for use by the wider workforce including volunteers, community workers and carers to identify and better manage malnutrition at an early stage.

“I think the nutrition wheel gave me enough of an outline to advise a person, give them the information and then having more local knowledge on more specifics helped me as well”

Nutrition Wheel Participant

¹ State of the Nation 2021, Older people and malnutrition in the UK today. Malnutrition Task Force, <https://www.malnutritiontaskforce.org.uk/>. Revised August 2021.

The Solution

The Nutrition Wheel is an interactive tool which can be used as a conversation starter to help identify if an older person is at risk of malnutrition (as undernutrition) at an early stage. It provides guidance, advice and signposting to further information and support on next steps. It is inexpensive, easy-to use, requires no specific training and can be used by anyone who supports or cares for an older person. It can be used by the voluntary sector, home care staff, meals on wheels and other community organisations to signpost to support available to reduce the need to access health and social care services. The Nutrition Wheel is made from durable, coated card and can be cleaned and disinfected and used multiple times.

The 'Nutrition Wheel' was developed through partnership working between Bournemouth University enabling healthcare students to help pilot new innovations and undertake research, key stakeholder organisations in the community (e.g. One community) and charities (The Patients Association, Age UK) working together with the Wessex AHSN. Collaborative working was key to the success of the development and implementation of the Nutrition Wheel, with the initial proof of concept being tested with community providers, practitioners, and clinicians. Further proofs of concept were also coproduced with a range of people in the community to ensure a holistic approach.

"I think it was very user friendly, I like the layout of it and just the colours used and the illustrations, I think they're fun, I think they're engaging"

Nutrition Wheel Participant

The Nutrition Wheel has been developed primarily for use by non-clinical practitioners (carers, care workers and volunteers) and integrated with other validated screening tools for malnutrition such as the Malnutrition Universal Screening Tool 'MUST'. It thus provides a framework for having a conversation to explore the factors that could increase someone's risk of malnutrition in a pro-active way. The Nutrition Wheel could be used to highlight the 'clinical concern' cited by [NICE clinical guideline 32](#); Nutrition support in adults as a prompt to nutrition screening and signposting to appropriate nutritional guidance.

Throughout the [adoption journey](#) people with the lived experience, including older people, volunteers, and care staff, have played an integral part in the coproduction of the innovation. In 2017, the initial prototype of the Nutrition Wheel was developed by a group of Adult Nursing and Midwifery students at Bournemouth University as part of their assignment on service improvement. They worked with 7 volunteers and 12 service users at Dorset based lunch clubs who provided informed feedback through interviews on the concept and design. Participants said it was a 'friendly' way to have a conversation around nutrition.



Further work in 2018, with 17 volunteers aged 35 to 82 years from community organisations in Hampshire and Dorset were undertaken to evaluate the usability of a designed Nutrition Wheel. From 8 interviews and 4 focus groups, they reported on key design improvements and wording to enhance the user-friendliness of the Nutrition Wheel as a tool to support a conversation around nutrition. Taken together, valuable input from people with the lived experience and other stakeholders shaped the final version in 2019. Further work to understand the feasibility and acceptability of the Nutrition Wheel to identify older people at risk of malnutrition was conducted with volunteers and staff with wider reach to people from other communities and different socio-economic backgrounds in Dorset, Hampshire but also in Hertfordshire.

Key Questions of the Nutrition Wheel

The Nutrition Wheel uses four key questions as a conversation starter to help identify people likely to be at increased risk of undernutrition:

- 1. Are you or your family concerned that you may be underweight or need nutritional advice?*
- 2. Have you lost a lot of weight unintentionally in the past 3-6 months?*
- 3. Have you noticed that your clothes or rings have become loose recently?*
- 4. Have you recently lost your appetite and/or interest in eating?*

These questions are based on the [Patients Association Nutrition Checklist](#), suggest follow up questions and guidance if any of the above are answered 'yes'.

The questions asked on the Nutrition Wheel come from the [Patients Association Nutrition Checklist](#), developed in 2018 to address a gap that existed for self-screening tools that were simple and easy to use. The questions in this checklist have been validated in the Journal of Human Nutrition and Dietetics Article, Identifying older people at risk of malnutrition and treatment in the community: prevalence and concurrent validation of the Patients Association Nutrition Checklist with 'MUST'.²

The Impact

The team at Bournemouth University have investigated how the Nutrition Wheel can identify risk of malnutrition among a group of 153 older adults living in the community and how they were signposted to appropriate support for malnutrition in older people working with community groups in Hampshire, Hertfordshire and Dorset (including lunch and activity groups).

Of the 152 older adults, there were 29.4% (n 45) older adults identified early, rated at risk of malnutrition. Of these, 17% (n 8) had concerns about being underweight or need nutritional advice), 51% (n 23) had loss of weight unintentionally in the past 3-6 months), 38% (n 17) reported on clothes or rings have become loose recently) and 49% (n 22) reported recent loss of appetite and interest in eating.

Five key themes were identified from 15 interviews and one in-person focus group (with 9 volunteers/staff). The themes were:

- design and usability;
- outcomes and concerns identified (including quality and frequency of meals, physical and mental problems, hydration);
- person-centred approaches;
- barriers;
- sustainability.

² Identifying older people at risk of malnutrition and treatment in the community: prevalence and concurrent validation of the Patients Association Nutrition Checklist with 'MUST', J. L. Murphy, A. Aburrow, A. Guestini, R. Brown, E. Parsons, K. Wallis. Journal of Human Nutrition and Dietetics, October 2019

The Nutrition Wheel was launched nationally by the Malnutrition Task Force (MTF) on 23rd September 2019. On 24th September 2019, the Wessex AHSN ran a webinar on the Nutrition Wheel for the other AHSNs across England. The purpose of the webinar was to share the research, development and next steps for the Nutrition Wheel. The Wessex AHSN engaged with the MTF (hosted by Age UK) because it is an organisation who work with partners across a range of sectors and settings, to raise awareness of malnutrition in later life and provide information and guidance and spread best practice and innovation to improve the lives of older people across the UK. Currently the MTF distributes copies of the Nutrition Wheel to range of stakeholders including service users, carers, care workers, volunteers.



The Nutrition Wheel has now been adopted by the Malnutrition Task Force (MTF) as one of their key resources to help identify the risk of malnutrition and as part of a resource pack. Thus, a key enabler for the Nutrition Wheel has been the adoption of the tool by the Malnutrition Task Force (MTF) to enable dissemination and spread nationally. The work of the MTF is presented on the Malnutrition [Task Force website](#). Learnings for wider implementation have been informed by the pilot projects working with community organisations across Wessex (using PDSA cycles) and other key partner organisations nationally. With evidence of the usability and acceptability of the Nutrition Wheel, it has been adopted with scaling-up further enabled by the MTF.

Specifically, the annual UK Malnutrition Awareness Weeks (UK MAW) in 2019, 2020 and 2021 have significantly increased awareness of the Nutrition Wheel. The UK MAW was co-founded in 2018 by the Malnutrition Task Force (MTF) and British Association for Parenteral and Enteral Nutrition (BAPEN) with the aim to raise awareness and understanding of the risks of malnutrition across different sectors and settings, in local communities and with the general public and health and social care professionals.

An internal process evaluation showed that volunteers and staff were using the Nutrition Wheel as a conversation starter about nutrition as part of their role. The tool opened-up the opportunity for older people to raise other health related issues and concerns. Training raised awareness of malnutrition and improved understanding of appropriate actions volunteers and staff could undertake in response. The Nutrition Wheel was an easy-to-use tool to identify risk of malnutrition and could be linked with other tasks. However wider signposting was needed to link with appropriate nutrition resources to offer guidance for some conditions³. Further work is needed to understand how the Nutrition Wheel could be embedded as part of volunteer/staff roles in the community and link with wider health and social care pathways.

The overarching ambition of the Nutritional Wheel is to prevent malnutrition in older people by way of intervention at an early stage, signposting to support, appropriate treatment and management and show that the benefits of treating malnutrition far outweigh the costs. The latest cost analysis by the British Association for Parenteral and Enteral Nutrition (BAPEN) estimates that the cost of malnutrition to the health and social care systems was around £19.6 billion in England in 2011-2012⁴. Treating someone who is malnourished in the UK, whilst living at home are reported to have healthcare costs that are 2-3 times more expensive than for someone who is not malnourished⁵. The estimated health and social care per capita of the population is £2417, however this expenditure rises to £7408 for those malnourished or at risk. Thus, it is estimated that about £5000 could be saved per person through better nutritional management, particularly when malnutrition is caught early.

“It is a good conversation starter and it sometimes led to discussions about issues related to nutrition, not necessarily about being under nourished but there was one conversation that I had with somebody which was about staying hydrated”

Nutrition Wheel Participant

³ Murphy JI, Aburrow A, Davies C, Wallis K. Using the Nutrition Wheel to identify risk of malnutrition among older adults in the community: a process evaluation. *Clinical Nutrition ESPEN* 2022. 48;487-488 <https://doi.org/10.1016/j.clnesp.2022.02.032>.

⁴ Elia, M. for the Malnutrition Action Group of BAPEN and the National Institute for Health Research Southampton Biomedical Research Centre. (2015) The cost of malnutrition in England and potential cost savings from nutritional interventions (full report): A report on the cost of disease-related malnutrition in England and a budget impact analysis of implementing the NICE guidelines/quality standard on nutritional support in adults. Available from: <http://www.bapen.org.uk/pdfs/economic-report-full.pdf>

⁵ Guest, J. F., Panca, M., Baeyens, J.P., de Man, F., Ljungqvist, O., Pichard, C., Wait, S and Wilson, L. (2011) Health economic impact of managing patients following a community-based diagnosis of malnutrition in the UK. *Clinical Nutrition*. 30 (4)

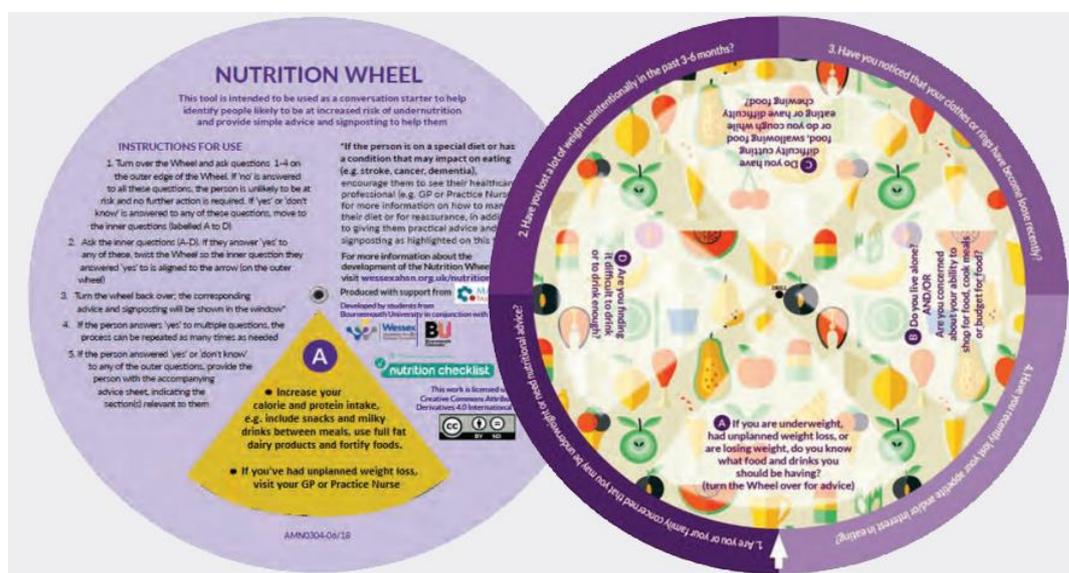


Figure 1: The Nutrition Wheel tool. Please note that the Nutrition Wheel is a hard copy tool. If you would like a copy, please contact the [Malnutrition Task Force](#).

Challenges and Enablers in Development

Process: Like many innovations, particularly those in the NHS, resourcing to support the development and implementation of the Nutrition Wheel was an initial issue. It was evident that it could potentially take time to bring an idea from concept to usability and implementation. This included recruiting participants, involving students, and allowing for cycles of feedback and coproduction.

Costs: Though the production and development costs for this tool are relatively small, with a significant potential return on investment, the team still had some challenges securing this resource. One of the ways costs were kept a minimum, was by producing a video with the support of a charity in a community church, allowing anyone who wanted to use the tool to learn how for free.

Time: Staff in the NHS have been under significant additional pressure during the Covid-19 pandemic, and with this pressure it can be harder to adopt new tools and innovations. The team behind the Nutrition Wheel has passion for their work in nutrition, and while it is everyone's responsibility, it is not always possible to make it a priority.

Staff Reaction: With anything new, a key enabler to sustainable use is how you implement it in a complex system. By collecting positive stories from those who had used the tool, people could see the value in this change and the team were able to spread the word about the Nutrition Wheel positively. The team received significant positive feedback from those using the tool at Age UK and could share this to increase awareness of the tool and its value.

Collaboration and Coproduction: By including a wide range of stakeholders in the design and refinement of the Nutrition Wheel, the team were able to agree on a format that is straightforward, visually appealing, and accessible to a range of audiences.

Next Steps

The Nutrition Wheel has opened up opportunities for older people to raise other health-related issues and concerns, even for people not at risk of malnutrition. In future, there is an opportunity to develop a digital version to help signpost people to appropriate online trusted resources, to suit the needs of the individual and offer guidance, and to test the tool with wider reach to those from a range of ethnic and cultural backgrounds. This online version could also further reduce costs for the project through reducing the number of physical versions produced.

While the Nutrition Wheel was developed primarily for use by non-clinical practitioners (carers, care workers and volunteers), the team can see a number of further opportunities for where this tool could be used in the community:

- In waiting areas within GP practices, community clinics, community pharmacies
- In care homes for family/carers at open days and coffee mornings
- By wardens supporting people in assisted housing
- By other community services, e.g. shops, barbers, hairdressers and opticians

This novel tool was part of the Wessex AHSN's Nutrition in Older People programme (2014-18), and has now been taken forward as part of their Healthy Ageing programme (<http://wessexahsn.org.uk/nutritionwheel>).

The Dorset Innovation Hub team are also supporting the implementation of the Nutrition Wheel in Dorset in the context of a wider review of malnutrition services and how best to identify people at risk of malnutrition as early as possible. Dorset is one of four newly designated [Health Foundation Innovation Hubs](#) in the United Kingdom. [The innovation hub](#) hosted by University Hospitals Dorset is overseen by a programme group of 13 partners: primary, community secondary and social care, academia, innovation, research, economy, industry and with patient and public involvement and engagement. This team support staff to use new innovations to support patients and service users. Their vision is to establish the conditions to facilitate and sustain innovation adoption across the Dorset ICS ([Our Dorset](#)). The hub draws on the respective partners experience and expertise as outlined by the Health Foundation to focus on the adaptation of innovation to the local context, using patient and public involvement and co-production principles to ensure that the process takes account of and is sensitive to the needs of patients, staff, existing culture and working practices.

With the continued and rapidly growing problem of malnutrition across Dorset (and nationally), the simple and cost effective Nutrition Wheel tool provides an opportunity to prevent malnutrition in older people by way of intervention at an early stage, saving NHS resource and providing the best outcomes for patients.

Find Out More

- State of the Nation 2021, Older people and malnutrition in the UK today. Malnutrition Task Force.
<https://www.malnutritiontaskforce.org.uk/>. (Revised August 2021)
- British Association for Parenteral and Enteral Nutrition 'MUST'.
[Malnutrition Universal Screening Tool \(bapen.org.uk\)](http://malnutritionuniversal.org.uk/)
- NICE Clinical Guidance 32
[Overview | Nutrition support for adults: oral nutrition support, enteral tube feeding and parenteral nutrition | Guidance | NICE](https://www.nice.org.uk/guidance/CG32)
- The Adoption Journey of the Nutrition Wheel
<https://wessexahsn.org.uk/img/projects/Development%20of%20the%20Nutrition%20Wheel.pdf>
- Patient Association Nutritional Checklist
[Patients Association Nutrition Checklist | The Patients Association \(patients-association.org.uk\)](http://patientsassociation.org.uk/)

This case study has been produced by the Beneficial Changes Network with thanks to the Jane Murphy, Professor of Nutrition at Bournemouth University and her team.

Please be aware that due to the short-term nature of the Beneficial Changes that have come from adapting to Covid-19, there is limited or emerging evidence in supporting these case studies. We will continually review and update these resources as further data becomes available for evaluation. Furthermore the publication of this case study is no way an endorsement of the described initiative by NHS England & Improvement.