Focus on Undernutrition in Care Homes

A service evaluation

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In the UK, undernutrition affects three million adults,[1] 1.3 million older people[1] and 35% of residents in care homes.[2] Annual costs associated with undernutrition in England are £19.6 billion,[3] with the cost of caring for an undernourished individual being 2-4 times that of a well-nourished individual[4, 5] due to the strain on health and social care resources.[3, 6]

Undernutrition is largely preventable and treatable[7-9] through pro-active screening and early intervention, which can reduce complications by 70% and mortality by 40%.[10] Key to achieving this[8, 11] is integrating screening and treatment into routine practices.[11-13]

Over recent years numerous standards, guidelines, toolkits and campaigns on undernutrition have raised awareness.[14] Yet, despite countless guidance there is still a discrepancy between policy and practice,[6, 15] with undernutrition being under-detected and under-treated.[2, 6, 16] In 2000, prior to these national initiatives, a pilot called 'Focus on Food' (later renamed Focus on Undernutrition [FoU]) was implemented into care homes in North East England to determine the most effective way to facilitate the implementation of undernutrition screening and guidelines.[17]

The pilot was one of the first in England to implement practices in care homes which have now become accepted practice across the UK,[18-24] including the implementation of:

- The 'Malnutrition Universal Screening Tool' ('MUST')[25] to identify residents at risk of undernutrition. FoU simplified and adapted the 'MUST' layout, which is endorsed by BAPEN, incorporating a results table, core care plan, weight and ulna height conversion charts and a dietary assessment[26]
- Standardised care pathways for the treatment of undernutrition, which promoted food and drink-based interventions (FB) as treatment rather than oral nutritional supplements (ONS)[27]
- Standardised care pathways for appropriate ONS prescribing, prior to a dietetic referral[28]
- The dietitian's role as an educator facilitator, delivering proactive training to empower care home staff to identify and treat undernutrition.

In 2003, following the pilot, FoU was established as a permanent part of the dietetic service in County Durham and Darlington. FoU provides free training to care homes on the identification and treatment of undernutrition for healthcare staff, facilitated by a dietetic assistant (DA) through a combination of workshop and e-learning or workbook. Catering staff attend a six-week catering course on menu planning and special diets facilitated by a dietitian. Following training, homes implement FoU's adapted 'MUST',[26] identified by independent research to be more effective than original 'MUST'[29] and care pathways[27, 28] which fulfil national guidance,[18-21] promoting FB interventions alongside the appropriate prescribing of ONS. Further information on FoU can be found online.[30] Annually all care homes are re-accredited by a DA through an audit against 18 quality standards linked to undernutrition, which are incorporated into the Local Authority commission incentives linked to funding.

Despite FoU being nationally acknowledged as an exemplary service model[16, 31, 32] no formal evidence existed of FoU's impact on undernutrition in care homes regardless of collecting evaluation data. A retrospective study was completed to evaluate the FoU service to determine the impact on undernutrition outcome measures in care homes.

The objectives were to determine if FoU influences the:

- Weight of residents at risk of undernutrition
- Prevalence of undernutrition
- Prevalence of pressure ulcers (PU).

Methodology

A retrospective pragmatic service evaluation was undertaken using pseudonymised data collected by a DA over 13 years on weight, undernutrition risk and PU from long-stay residents' notes before and six months after FoU training. Ethical approval was not required; written consent was obtained from the home manager. Data was inputted into Access, then analysed using the Statistical Package for the Social Sciences (SPSS). Statistical advice was sought from Newcastle University.

Weight was calculated as rate of weight change, represented as kilogram per month, due to the confounding impact of duration. The majority of data were analysed as independent samples, because paired data was only available for 49% of residents.

Results

Retrospective data was analysed on 104 homes, 4315 residents (71.3% female; mean stay 10.8 (1-278) months), 55.3% residential, 25.0% nursing, 19.7% EMI care.

Weight change

Following FoU a significant improvement in weight change was shown for 'at risk' residents (**Figure 1**). A significant difference was identified between undernutrition risk at baseline (p<0.001), evaluation (p=0.009) and overall (p<0.001). The greatest weight change was reflected in high risk residents (absolute change: 0.29 kg/month).

Further analysis of 'at risk' residents according to treatment identified all treatment options reversed from weight loss to weight gain after FoU, with the greatest improvements seen in residents prescribed ONS, but no significant difference (p=0.399) was found between treatments (**Figure 2**). Only 28.3% (208/735) and 31.1% (127/409) of 'at risk' residents were prescribed ONS at baseline and evaluation respectively, with 32.2% (101/314) prescribed ONS both at baseline and evaluation.

Undernutrition prevalence

Overall there was a significant reduction (11.0%) in the undernutrition prevalence following FoU (**Figure 3**).

Further analysis of 'at risk' residents according to treatment identified the greatest improvements in the 'food based' group (45.7%). Overall 42.4% (134/316) of 'at risk' residents experienced an improvement, 43.4% (137/316) no change and 14.2% (45/316) a decline in undernutrition risk (**Figure 4**).

A significant improvement (p<0.001) in undertaking nutritional screening was identified following FoU, increasing from 76.3% to 98.7%.

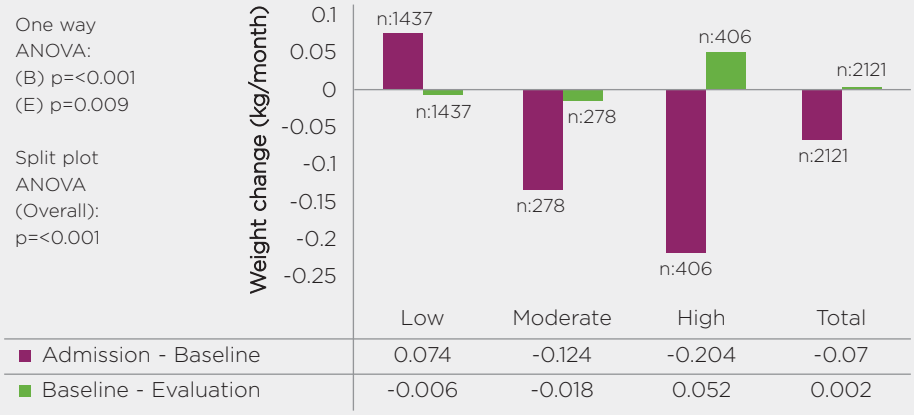
Pressure ulcers

Following FoU pressure ulcers (PU) overall significantly reduced 51% (p<0.001). At baseline there was a significant difference in PU prevalence which increased with severity of undernutrition (p<0.001) but following FoU no difference was found between risk groups (p=0.233) (**Figure 5**).

Undernutrition risk appears to have an impact on PU; the odds overall of developing a PU following FoU was 53% less, with the true population effect between 64% to 38%. The greatest reduction (78%) was in moderate risk residents. The odds identified a significant reduction in PU in all risk groups (**Table 1**).

Further analysis on PU prevalence in 'at risk residents' according to treatment identified those receiving dietetic care had the greatest reduction, but sample size was limited and no significance was found between treatments (p=0.105, p=0.580) (**Figure 6**).

Figure 1: Rate of Weight Change According to Undernutrition Risk

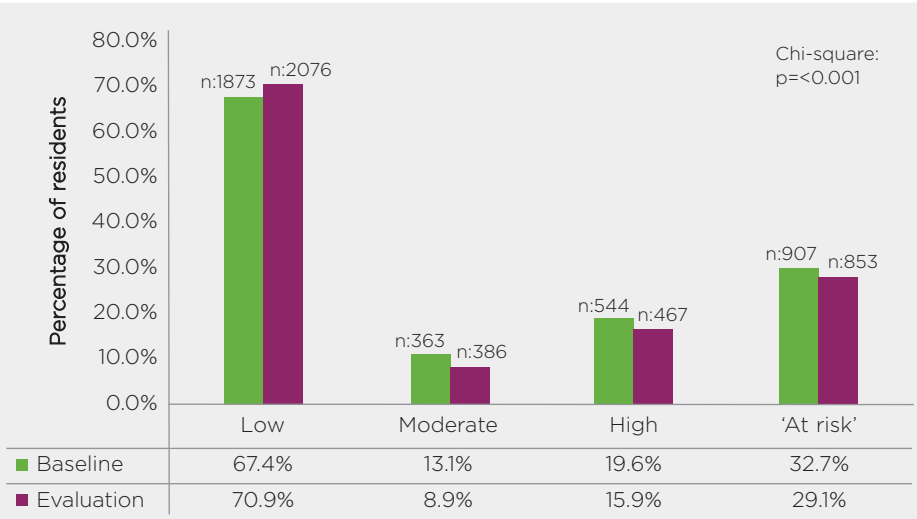


	Low	Moderate	High	Total
Admission - Baseline	0.074	-0.124	-0.204	-0.07
Baseline - Evaluation	-0.006	-0.018	0.052	0.002

Figure 2: Rate of Weight Change in 'at risk' Residents According to Treatment

	Food Based (FB)	FB and Supplements (ONS)	FB, ONS and Dietitian	Overall
Admission - Baseline	-0.094	-0.315	-0.168	-0.132
Baseline - Evaluation	0.037	0.058	0.122	0.057

Figure 3: Prevalence of Undernutrition



	Low	Moderate	High	'At risk'
Baseline	67.4%	13.1%	19.6%	32.7%
Evaluation	70.9%	8.9%	15.9%	29.1%

Discussion

This service evaluation has shown FoU delivered by dietetic assistants (DA) positively impacts undernutrition outcome measures in care homes, through achieving significant improvements in weight, undernutrition and PU outcome measures that are comparable to published research. FoU was one of the first dietetic services to promote food-based interventions.[27] No systematic review[33-36] has made specific conclusions regarding nutritional interventions for undernutrition in care homes,[23] due to inconsistent and limited strong quality evidence for the impact of FB on outcomes.[37] However, analysis of the three 'at risk' treatments clearly indicates FoU alone ('food-based) had a positive impact on all outcomes, although no significant difference was identified between treatments for any objective (**Figures 2, 4, 6**).

Weight change

The rate of weight changes significantly improved in 'at risk' residents following FoU. This is in keeping with findings from the nutritional screening week (NSW) survey,[2] where undernutrition risk was significantly related to weight change, accounting for 9.3% variability in weight.

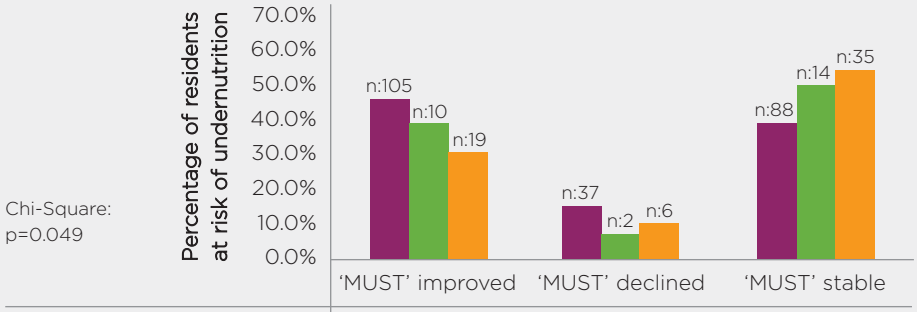
Undernutrition prevalence

Prevalence of undernutrition significantly reduced by 11% to 29.1% (**Figure 2**); 60% of 'at risk' were high risk, reducing to 54.7%. At baseline local prevalence (32.7%) was lower or comparable to other UK studies using 'MUST' (31.9%- 41.6%).[2, 23, 38, 39, 40-45] FoU's lower prevalence is encouraging, because the North has a 73% higher risk of undernutrition,[46] in addition the North-East is a deprived region[47] and undernutrition is associated with deprivation[9], although Parsons[44] identified that deprivation did not impact undernutrition in care homes.

Comparing FoU's impact on undernutrition is limited because other UK studies using 'MUST'[23, 45, 48, 49] did not report on prevalence change; and foreign studies[50-55] used alternative outcomes or non-comparable nutritional screening tools. Similar studies[46, 56] implementing education and care pathways identified both a reduction[56] and no impact[43] in prevalence.

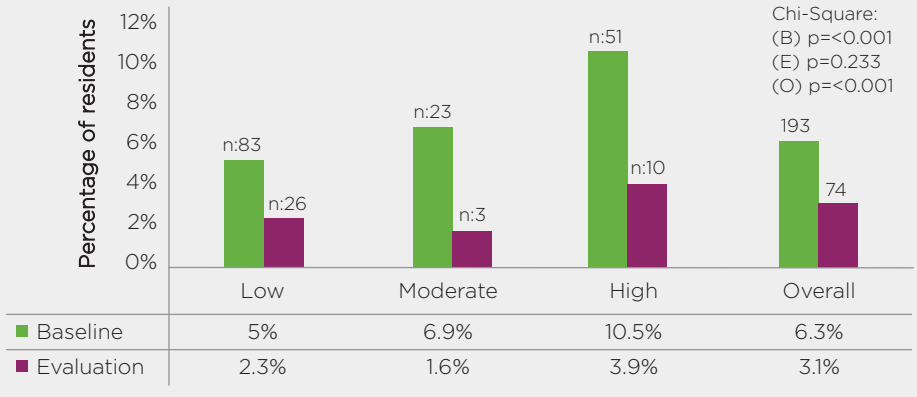
FoU uses 'MUST',[25] recommended by many UK organisations[2] as simple, acceptable and quick to use,[57] used by 96% care homes.[2] FoU was the first UK service to systematically implement 'MUST' into care homes, through adapting the layout for simplicity,[26, 58] which independent research has identified to be simpler, quicker, more accurate and preferred to original 'MUST'.[29]

Figure 4: Changes in Undernutrition Risk in 'at risk' Residents According to Treatment



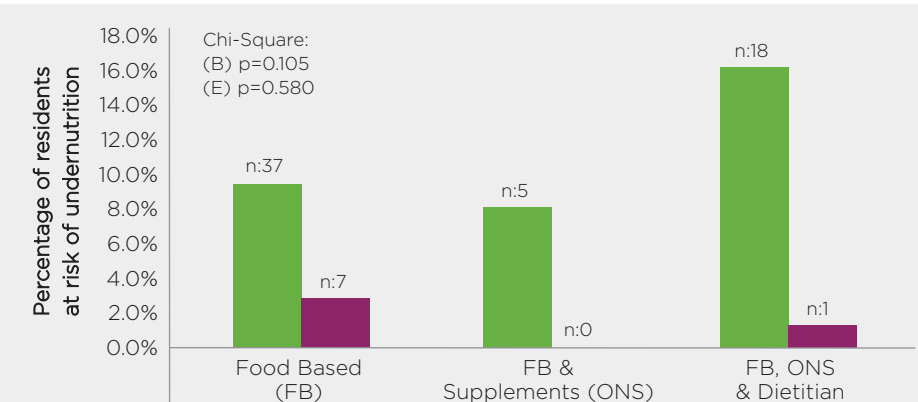
	'MUST' improved	'MUST' declined	'MUST' stable
Food Based (FB)	45.7%	16.1%	38.3%
FB and Supplements (ONS)	38.5%	7.7%	53.8%
FB, ONS and Dietitian	31.7%	10.0%	58.3%

Figure 5: Prevalence of Pressure Ulcers According to Undernutrition Risk



	Low	Moderate	High	Overall
Baseline	5%	6.9%	10.5%	6.3%
Evaluation	2.3%	1.6%	3.9%	3.1%

Figure 6: Prevalence of Pressure Ulcers in 'at risk' Residents According to Treatment



	Food Based (FB)	FB & Supplements (ONS)	FB, ONS & Dietitian
Baseline	9.1%	8.2%	15.7%
Evaluation	3.1%	0.0%	1.8%

Table 1: Odds Ratio for Pressure Damage According to Nutritional Risk

Risk of undernutrition*	Odds Ratio	Reduction in pressure ulcers after training	95% CI OR		Statistics
			Lower	Upper	
Low	0.45	55%	0.29	0.71	p=0.001
Moderate	0.22	78%	0.06	0.73	p=0.001
High	0.35	65%	0.17	0.69	p=0.003
Overall	0.47	53%	0.36	0.62	p<0.001

* Risk of undernutrition based on 'MUST'. CI: Confidence Interval. OR: Odds Ratio

'MUST' completion significantly improved (76.3%-98.7%), reflective of other studies, following training.[23, 45, 56] Accuracy not completion should be key to audits,[58-60] which is incorporated into FoU's annual reaccreditation.

Training is key to implementing 'MUST',[12, 58-59] supported by interventions identified by staff to help overcome barriers.[12, 60] Since conception FoU has embedded these principles through adapting 'MUST',[26] developing practical resources and training to empower and skill staff.[30]

Pressure ulcers

Overall PU prevalence significantly declined, 51%, with prevalence significantly increasing with severity of undernutrition risk at baseline, but following FoU there was no difference between risks. PU development is multifactorial,[61] but significantly associated with undernutrition.[62, 63] Accounting for 33% costs associated with PU,[64] nutritional intervention is one of the most cost-effective strategies for PU.[65] Undernutrition is a reversible PU risk factor,[63] so early identification and treatment is essential.[63, 65] Through screening and interventions FoU was associated with a 68% reduction of PU in 'at risk' residents (**Figure 5**). Although there is a lack of strong evidence between undernutrition and PU,[66, 67] these findings are comparable with predicted reductions when treated with ONS.[66, 68]

Increased odds of PU are identified with increased severity of undernutrition,[62, 69] or >5% weight loss.[63] FoU interventions reduced the odds of developing PU, with greatest odds seen in moderate risk, indicating a 78% PU reduction. This is in keeping with other studies where improved nutrition knowledge,[69] undernutrition screening,[69] and ONS treatment[66] have reduced PU odds.

Strengths and limitations

This is the first large scale service evaluation on undernutrition for care homes in England. However, as a retrospective service evaluation the limitations were the constraints on data collection to evaluate outcomes compared to research, such as usage of health resources and health economics. While FoU demonstrated the potential to reduce possible harms, such as PU, it was out of scope to evaluate the impact on other potential harms such as infections or falls, which reduce with improved nutritional status.[10] Nevertheless, the strengths of being a large-scale pragmatic service evaluation undertaken over 13 years and incorporating an uncontrolled generic care home population, suggest these findings are reflective of everyday practices.

Conclusion

Elia[13] advocated *'it is imperative national policy ensures undernutrition detection and treatment are embedded in routine care'*, through training, integrated accurate systems of recording and auditing undernutrition management.[2, 13, 15, 16, 18, 38, 61, 70-73] FoU is multifaceted, delivering multi-disciplinary whole home training, alongside tailored support, practical resources and annual reaccreditation against quality standards which are linked to local authority funding incentives, all of which have been identified to be key to undernutrition management.[12, 16, 31, 38, 58, 61, 70] Although numerous studies have shown improvements in undernutrition following training,[45, 49, 50, 54, 56, 59, 74] FoU's multifaceted approach to undernutrition is identified to be more effective than a single approach, such as training or FB.[50, 75] This service evaluation demonstrates FoU delivered by dietetic assistants is a significantly effective approach for dietetic services to improve the management of undernutrition in care homes.

The full article is available: Masters, R (2019) Focus on Undernutrition in Care Homes: A Retrospective Service Evaluation.[76] For further information email: info@focusonundernutrition.co.uk

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