Supplementary file 1: English version of the questionnaire

University of Glasgow ErasmusMC Universitair Medisch Centrum Rotterdam Queensland Government

Undernutrition in Children - UK

1.

1 / 4 25%

1. What is your profession?
○ Medical Doctor
○ Dietician
Other (please specify)

2. What is your speciality/sub-speciality?

3. What healthcare setting do you work in?
☐ District General Hospital
☐ Tertiary Hospital
☐ Community
☐ Private Care
☐ Primary Care

Other (please specify)

4. Number of years work experience in
Paediatrics
Non-Paediatrics

5. Highest professional/educational qualification achieved (e.g MBChB, BSc, MSc, RD)

6. How important is nutrition as an aspect of your patients care?

Not important   Highly important

○   ○   ○   ○   ○

7. How involved are you in the nutritional care of your patients?

Not involved   Highly involved

○   ○   ○   ○   ○

8. Indicate the **importance** of the following **weight and body composition** features as **indicators of undernutrition risk** in paediatric patients

	Not important	Slightly important	Moderately important	Important	Highly important
Suboptimal (low) weight for height or BMI	○	○	○	○	○
A child with short stature (height below reference values)	○	○	○	○	○
A child with ongoing weight loss	○	○	○	○	○
A child who gains weight but slower than expected	○	○	○	○	○
A child who grows (height) slower than expected	○	○	○	○	○
A child with normal fat but low lean (muscle) stores	○	○	○	○	○
A child with low fat stores but normal lean (muscle) stores	○	○	○	○	○
A child with both low fat and lean (muscle) stores	○	○	○	○	○

Other (please specify)

[   ]

9. Indicate the **importance** of the following **intake and requirement** features as **indicators of undernutrition risk** in paediatric patients

	Not important	Slightly important	Moderately important	Important	Highly important
Suboptimal (low) energy/macronutrient (protein, carbohydrate, fat) intake	○	○	○	○	○
Suboptimal (low) micronutrient (vitamins/minerals) intake	○	○	○	○	○
Increased energy/nutrient losses (e.g. vomiting, malabsorption)	○	○	○	○	○
Increased energy/nutrient requirements (e.g. due to hypermetabolism)	○	○	○	○	○
Altered requirements due to impaired metabolism (e.g. phenylketonuria)	○	○	○	○	○
History of high nutritional risk condition (e.g. Crohn's disease)	○	○	○	○	○

Other (please specify)

[   ]

10. Indicate the **importance** of the following **miscellaneous** features as **indicators of undernutrition risk** in paediatric patients

	Not important	Slightly important	Moderately important	Important	Highly important
A child with an ongoing systemic inflammatory response (e.g. high CRP)	○	○	○	○	○
A child with poor functional capacity (e.g. muscle weakness)	○	○	○	○	○
A child with low activity (energy levels)	○	○	○	○	○
A child with cognitive/developmental delay	○	○	○	○	○
A child with abnormal blood markers indicating poor nutritional status	○	○	○	○	○
Age of child	○	○	○	○	○
Prematurity	○	○	○	○	○

Other (please specify)

11. Which of the following approaches do you use **to screen** for undernutrition in the majority of paediatric patients **in routine** clinical practice?

- ☐ We do not regularly screen
- ☐ Height for age growth chart
- ☐ Weight for age growth chart
- ☐ BMI charts or weight for height
- ☐ Undernutrition screening tools (e.g. PYMS, STAMP)

- ☐ Measure blood nutritional markers (e.g. albumin)
- ☐ Measure blood micronutrient status (vitamins and minerals)
- ☐ Classify them according to their underlying condition (e.g. high nutritional risk disease)
- ☐ Assess the impact of the current condition(chronicity and severity) on intake, requirements and losses
- ☐ Visual inspection (eye-balling)

- ☐ Measure body composition (e.g. skin folds, MUAC)
- ☐ Assess changes in weight (loss or slow weight gain)
- ☐ Assess changes in normal/usual dietary intake
- ☐ Measure inflammatory markers (e.g. CRP)
- ☐ Assess strength and energy levels

Other (please specify)

[   ]

12. Which growth charts do you use in your clinical area (e.g. WHO, CDC)?

[   ]

13. If you use a screening tool which do you use (e.g. PYMS, STAMP, STRONGkids)?

[   ]

14. Please rank the following according to their importance as **causes** of disease associated undernutrition (1 - most important 4 - least important).

	Rank
Suboptimal intake	[▼]
Increased nutrient/energy requirements	[▼]
Increased losses	[▼]
Inflammatory response	[▼]

15. In your opinion what are the **three main long-term consequences** of undernutrition in paediatric patients?

☐ Increased risk of morbidity (complications)

☐ Increased risk of mortality (death)

☐ Slower recovery from illness

☐ Suppressed immune system defence

☐ Reduced daily activity/functionality

☐ Poor growth

☐ Delayed pubertal development

☐ Poor bone health

☐ Poor brain (cognitive) development

☐ Poor quality of life

Other (please specify)

[   ]

16. What are the main barriers to the **routine evaluation** of nutritional status in paediatric patients **in your area of clinical practice** ?

☐ There are no barriers

☐ No local policy or guidelines to screen for undernutrition

☐ Low staff awareness on the role of nutrition on patient care

☐ Inadequate equipment to assess nutritional status

☐ No training on how to assess/screen for undernutrition

☐ Lack of nutrition support teams

☐ No method in place to screen for undernutrition

☐ Lack of staff

☐ Not many dietitians to intervene in undernourished children

☐ Inadequate management strategies to intervene for undernourished children

☐ Lack of time to screen

☐ Nutrition is not as important as other aspects of patients' care

Other (please specify)

[   ]

Respondents: N=937

No clinical experience in pediatrics: N=109

No medical doctors or paediatric dietitians: N=12

No paediatric gastroenterologists or expertise in nutrition: N=123

Included in final analysis: N=693

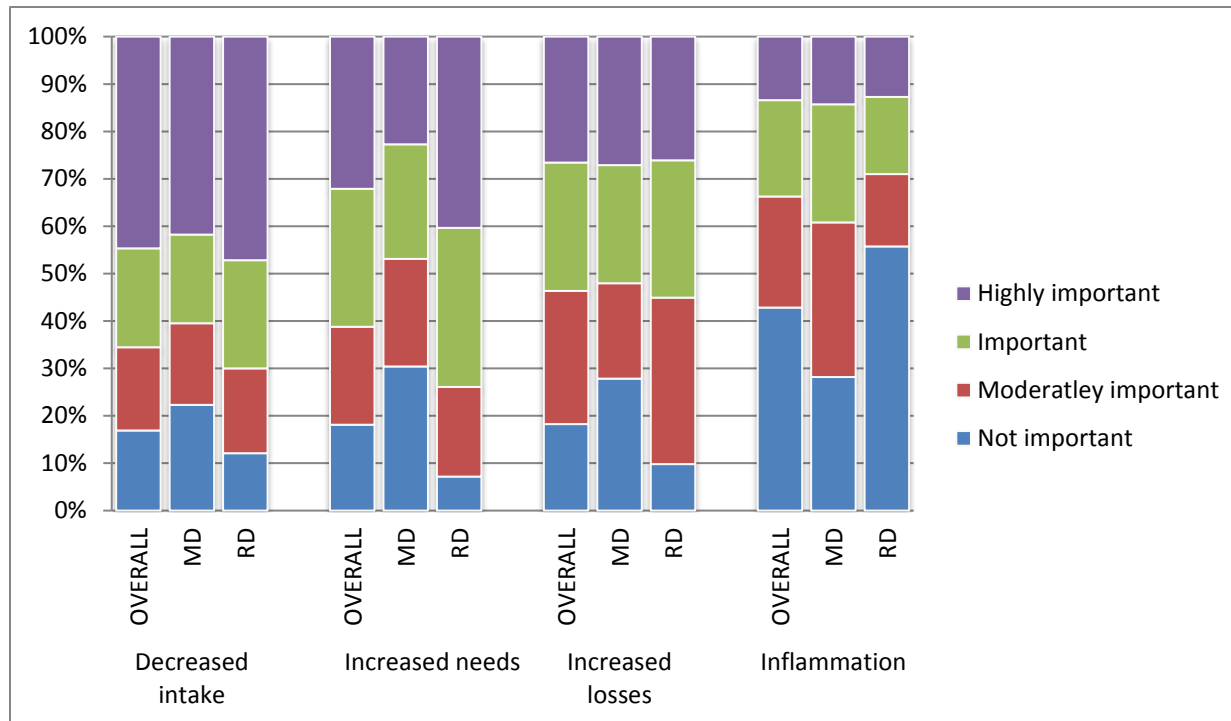**Supplementary file 3A. Aetiology of disease associated malnutrition (presented per profession).**

Not answered: n= 112

Supplementary file 3B. Aetiology of disease associated malnutrition (presented per country).
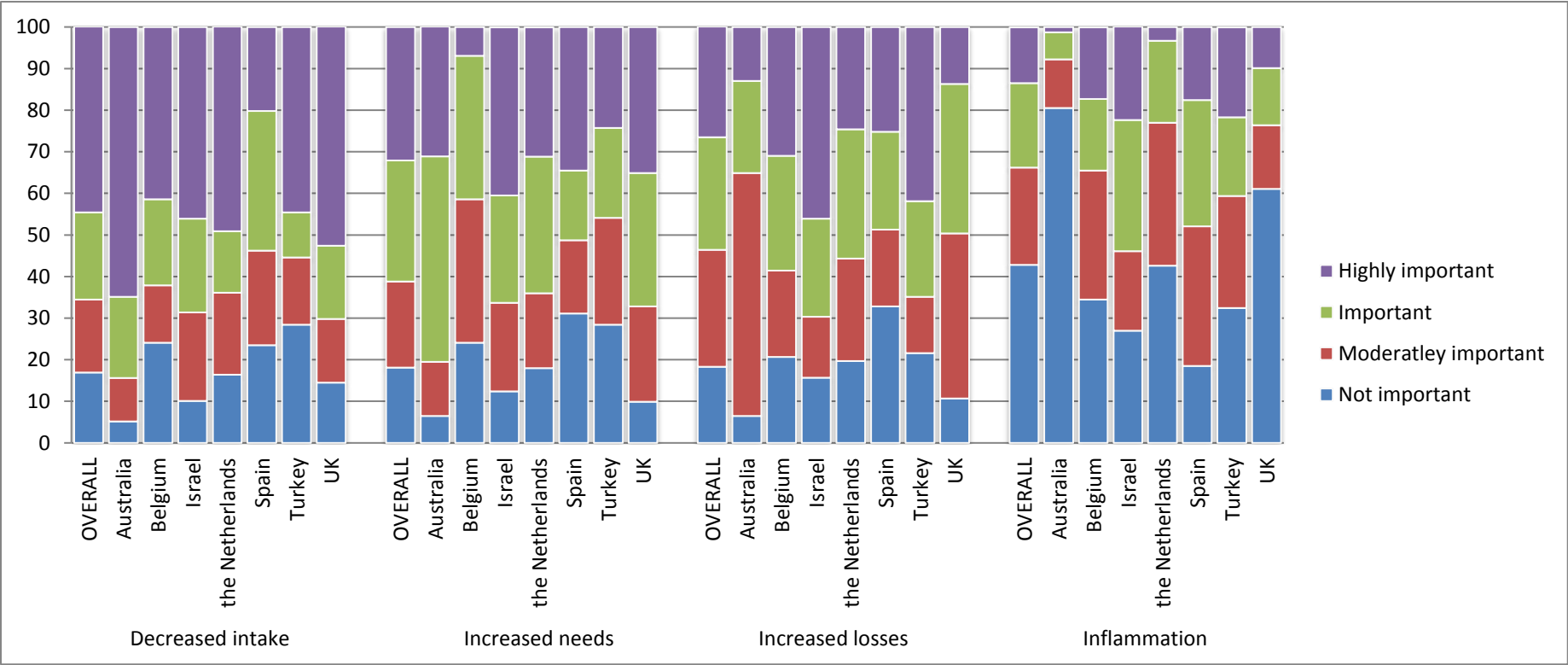
Not answered: n= 112

Supplementary file 3C. Consequences of disease associated malnutrition (presented per profession).

	Total n (%)	RD n (%)	MD n (%)	p-value
Increased complications	381 (71.5)	183 (63.1)	198 (81.5)	<0.001
Increased mortality	86 (16.1)	39 (13.4)	47 (19.3)	0.076
Slower disease recovery	177 (32.2)	83 (28.6)	94 (38.7)	0.016
Suppressed immune function	123 (23.1)	59 (20.3)	64 (26.3)	0.121
Decreased daily activity	56 (10.5)	33 (11.4)	23 (9.5)	0.483
Poor growth	381 (71.5)	232 (80.0)	149 (61.3)	<0.001
Poor pubertal development	41 (7.7)	23 (7.9)	18 (7.4)	0.871
Poor bone health	68 (12.8)	54 (18.6)	14 (5.8)	<0.001
Poor cognitive development	186 (34.9)	105 (36.2)	81 (33.3)	0.523
Decreased quality of life	94 (17.6)	54 (18.6)	40 (16.5)	0.569

Not or incorrectly answered: n= 160

Supplementary file 3C. Consequences of disease associated malnutrition (presented per country).

	Total n (%)	Austalia n (%)	Belgium n (%)	Israel n (%)	The Netherlands n (%)	Spain n (%)	Turkey n (%)	UK n (%)	p-value
Increased complications	381 (71.5)	50 (71.4)	18 (72.0)	46 (54.1)	37 (63.8)	95 (95.0)	53 (76.8)	82 (65.1)	<0.001
Increased mortality	86 (16.1)	15 (21.4)	4 (16.0)	5 (5.9)	3 (5.2)	13 (13.0)	27 (39.1)	19 (15.1)	<0.001
Slower disease recovery	177 (32.2)	15 (21.4)	11 (44.0)	27 (31.8)	25 (43.1)	47 (47.0)	16 (23.2)	36 (28.6)	0.002
Suppressed immune function	123 (23.1)	12 (17.1)	8 (32.0)	21 (24.7)	13 (22.4)	29 (29.0)	15 (21.7)	25 (19.8)	0.489
Decreased daily activity	56 (10.5)	11 (15.7)	1 (4.0)	3 (3.5)	15 (25.9)	7 (7.0)	3 (4.3)	16 (12.7)	<0.001
Poor growth	381 (71.5)	52 (74.3)	17 (68.0)	76 (89.4)	44 (75.9)	53 (53.0)	48 (69.6)	91 (72.2)	<0.001
Poor pubertal development	41 (7.7)	3 (4.3)	1 (4.0)	9 (10.6)	9 (15.5)	6 (6.0)	1 (1.4)	12 (9.5)	0.053
Poor bone health	68 (12.8)	8 (11.4)	2 (8.0)	27 (31.8)	1 (1.7)	8 (8.0)	3 (4.3)	19 (15.1)	<0.001
Poor cognitive development	186 (34.9)	35 (50.0)	10 (40.0)	26 (30.6)	19 (32.8)	20 (20.0)	28 (40.6)	48 (38.1)	0.003
Decreased quality of life	94 (17.6)	9 (12.9)	3 (12.0)	15 (17.6)	8 (13.8)	21 (21.0)	12 (17.4)	26 (20.6)	0.704

Not or incorrectly answered: n= 160

Supplementary file 4. Barriers to the routine evaluation of nutritional status: presentation per profession

	Total n (%)	RD n (%)	MD n (%)	p-value
No barriers	77 (13.2)	44 (14.4)	33 (11.9)	0.380
Low staff awareness	277 (47.5)	122 (39.9)	155 (56.0)	<0.001
No local policy or guidelines	195 (33.4)	117 (38.2)	78 (28.2)	0.010
Lack of time	195 (33.4)	85 (27.8)	110 (39.7)	0.002
Not many dieticians to intervene	191 (32.8)	70 (22.9)	121 (43.7)	<0.001
No training	181 (31.0)	75 (24.5)	106 (38.3)	<0.001
No method in place for screening	137 (23.5)	81 (26.5)	56 (20.2)	0.075
Lack of staff	137 (23.5)	62 (20.3)	75 (27.1)	0.053
Lack of nutrition support teams	128 (22.0)	56 (18.3)	72 (26.0)	0.025
Inadequate equipment	125 (21.4)	54 (17.6)	71 (25.6)	0.019
Inadequate strategies to intervene	85 (14.6)	37 (12.1)	48 (17.3)	0.074
Nutrition less important than other aspects of patient care	78 (13.4)	35 (11.4)	43 (15.5)	0.148

Not answered: n= 110; RD: registered dietitians; MD: medical doctors