Distúrbios da Nutrição
Subnutrição e Obesidade

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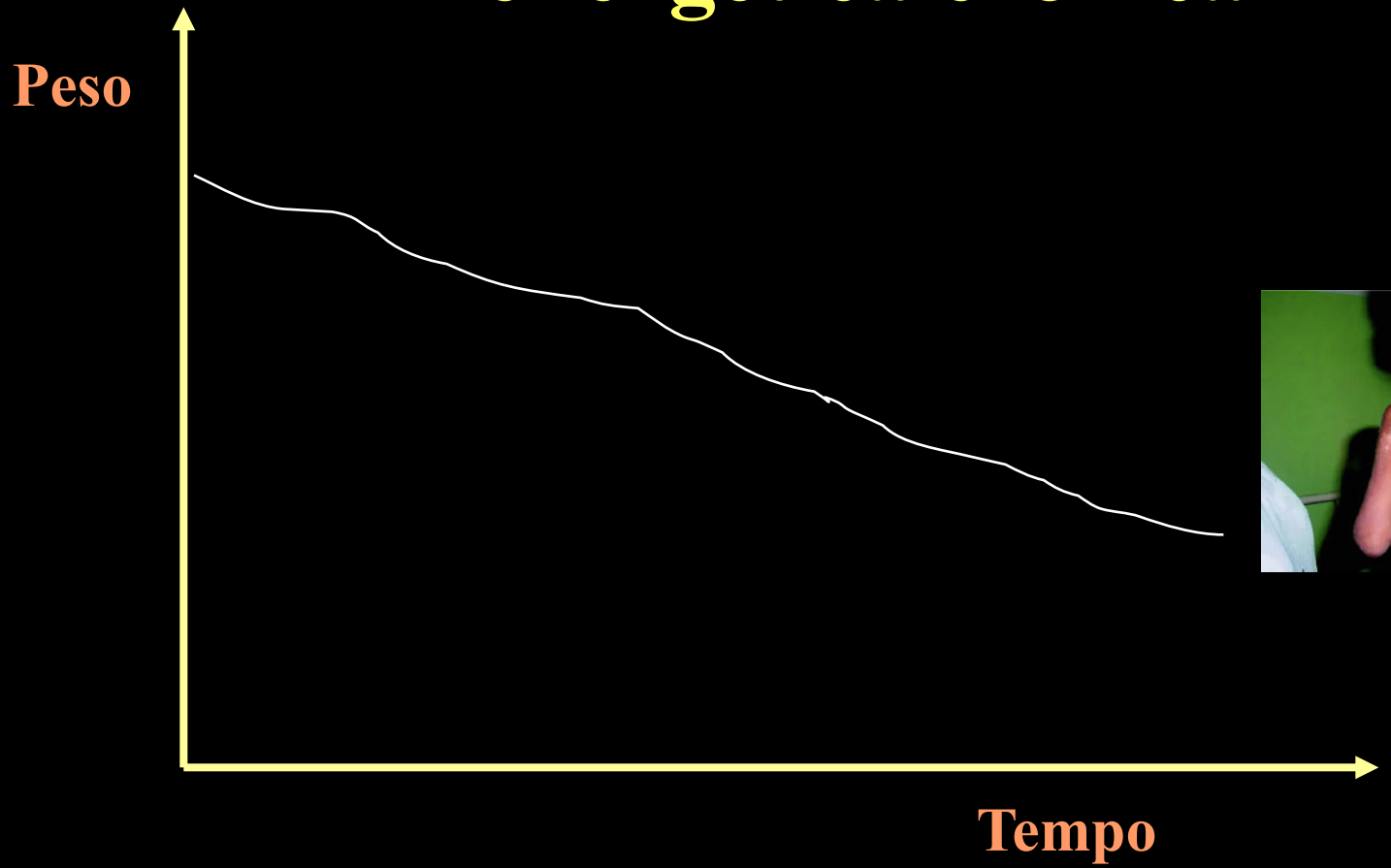
Objetivos da aula

Ao final da aula o aluno será capaz de:

- ✓ Descrever a fisiopatologia da subnutrição energética e da subnutrição proteica aguda e seu impacto sobre o crescimento e desenvolvimento infantil
- ✓ Descrever as causas do excesso de peso na população pediátrica
- ✓ Descrever estratégias e o papel do fisioterapeuta e do terapeuta ocupacional no tratamento da subnutrição e da obesidade no contexto de equipe interdisciplinar

Marasmo Nutricional – Subnutrição energética crônica



Hipotrofia de massa corporal gorda e relativa preservação de massa corporal magra

Subnutrição

Causa primária

Causa secundária

↓ ↓

Alteração bioquímica

↓

Alteração funcional

↓

Alteração anatômica

Subnutrição infantil hospitalar

Etiologia

Doença de base

Diagnóstico nutricional impróprio

Conduta nutricional inadequada

Subnutrição infantil intra – hospitalar

Marasmo

- Deficiência energética
- Forma mais comum de subnutrição em lactentes (Delgado *et al*. 2000)
- Ingestão deficiente de nutrientes

Subnutrição infantil intra – hospitalar

Marasmo

- Subnutrição crônica
- Redução da massa corporal gorda
- Redução da massa corporal magra → ↓ proteólise por adaptação fisiológica

Marasmo – deficiência crônica de alimentos

A subnutrição crônica tem impacto direto no crescimento e no desenvolvimento infantil: comprometimento dos sistemas neurológico, imunológico, cardiorrespiratório e cognitivo

Subnutrição Protéica

- Deficiência protéica
- Edema
- Queda de cabelo e mudança de cor
- Descamação
- Anorexia
- Esteatose hepática
- Irritabilidade

Kwashiorkor

William C D. Lancet, 1935

Kwashiorkor

Hipoalbuminemia crônica *versus* hipoalbuminemia aguda

Lunn P G. *et al*, 1979

Fisiopatologia?

Fisiopatologia

Inadequada ingestão alimentar

↓

Kwashiorkor

Aumento de citocinas

↓

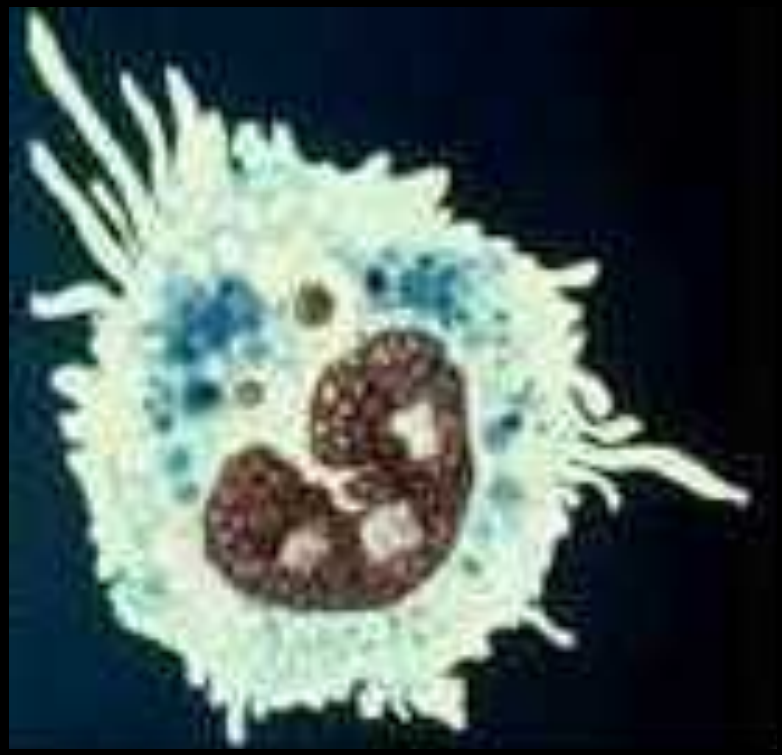
Estado de deficiência metabólica nutricional resultante de uma disfunção orgânica de base

↓

Subnutrição proteico aguda

Infecção/inflamação → macrófago → IL1, IL6, TNFα

- Anorexia
- Hiperglicemia
- Anemia (RFA)
- Hipercatabolismo
- Hipermetabolismo
- Hipoalbuminemia
- Edema



Sauerwein R W. *et al*, 1997
Am J Clin Nutr

Kwashiorkor-like

Subnutrição protéico aguda

Reação de fase aguda

Síndrome da resposta inflamatória sistêmica

Avaliação e Diagnóstico Nutricional

Subnutrição proteico aguda

Exame físico

- Edema
- Pele em aspecto celofane
- Língua despapilada
- Queda de cabelo
- Olhos sem brilho
- Mucosas descoradas
- Hepatomegalia

Diminuição da massa magra e da força muscular

Avaliação e Diagnóstico Nutricional

Subnutrição proteico aguda

Exame bioquímico

- Albumina - < 2,8g/dl
- Transferrina - < 150mg/dl
- Capacidade total de ligação de ferro - ↓
- Ferro sérico - ↓
- Ferritina - ↑ (excesso aparente de ferro em crianças com *Kwashiorkor* – Sive A A *et al*. 1996; *S Afr Med J*)

Avaliação e Diagnóstico Nutricional

Subnutrição proteico aguda

Exame bioquímico

- Proteína C reativa - > 7mg/dl; > 20mg/dl (Índice sensível da infecção bacteriana em crianças – Ekanem E E. *et al*. 1997; *Acta Paediatr*)
- Balanço nitrogenado < 0
- Índice creatinina altura < 80%
- Sódio sérico < 136mEq/l
- Glicemia - > 120mg/dl

Kwashiorkor

Conduta nutricional

Terapia nutricional precoce

Nutrição enteral *versus* parenteral

Equipe interdisciplinar

Recuperação da massa magra e da força muscular

Invited Review

aspen | LEADING THE SCIENCE AND PRACTICE OF CLINICAL NUTRITION
American Society for Parenteral and Enteral Nutrition

Functional Assessment of Nutrition Status

Mary Krystofiak Russell, MS, RDN, LDN, FAND[1]

Nutrition in Clinical Practice
Volume 30 Number 2
April 2015 211–218

DOI: 10.1177/0884533615570094
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Abstract

Functional status assessment has been recommended as a part of a complete nutrition assessment for decades, but the specific components of this assessment have eluded a consensus definition. The recent Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition consensus criteria for identification of malnutrition include functional assessment determined by handgrip dynamometry, with the understanding that this technique is not practical for use in some patient populations. Other techniques for functional assessment include physical performance measures such as timed gait and chair stands, as well as activities of daily living tools such as the Katz Index, Lawton Scale, and Karnofsky Scale Index. Manual muscle testing and computed tomography scan assessment of lean tissue are other tools that show promise in correlating functional and nutrition assessments. Functional assessment parameters may be least well correlated with nutrition status in older individuals. Despite a number of scientific studies of a variety of tools for functional assessment, there is to date no definitive tool for use in all individuals in all settings. Nutrition scientists and clinicians must continue to collaborate with colleagues in physical and occupational therapy, geriatrics, and nursing to refine current functional assessment tools to more effectively correlate with nutrition and malnutrition assessment parameters. (*Nutr Clin Pract*. 2015;30:211-218)

Nutrition 32 (2016) 199–205

Contents lists available at ScienceDirect

Nutrition

journal homepage: www.nutritionjrnl.com

Applied nutritional investigation

Multidisciplinary nutritional support for undernutrition in nursing home and home-care: A cluster randomized controlled trial

Anne Marie Beck Ph.D. Senior Researcher [a,*], Annette Gøgsig Christensen M.Sc. [b], Birthe Stenbæk Hansen M.Sc. [b], Signe Damsbo-Svendsen M.Sc. [b], Tina Kreinfeldt Skovgaard Møller Clinical Dietician [b]

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Conclusion

Multidisciplinary nutritional support in Danish elderly adults in nursing home and home-care focusing on individual treatment of potentially modifiable nutritional risk factors identified with the EVS, and involving physiotherapists, registered dietitians, and occupational therapists, as required, could have a positive effect on quality of life, muscle strength, and oral care.

Journal of Pediatric Gastroenterology and Nutrition
43:123–135 © July 2006 Lippincott Williams & Wilkins, Philadelphia

Medical Position Paper

Nutrition Support for Neurologically Impaired Children: A Clinical Report of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition

*Valerie Marchand, †Kathleen J. Motil, and the NASPGHAN Committee on Nutrition

**Department of Pediatrics, University of Montreal, Montreal, Canada; †USDA/ARS Children's Nutrition Research Center and the Department of Pediatrics Baylor College of Medicine, Houston, Texas*

ABSTRACT
Undernutrition, growth failure, overweight, micronutrient deficiencies, and osteopenia are nutritional comorbidities that affect the neurologically impaired child. Monitoring neurologically impaired children for nutritional comorbidities is an integral part of their care. Early involvement by a multidisciplinary team of physicians, nurses, dieticians, occupational and speech therapists, psychologists, and social workers is essential to prevent the adverse outcomes associated with feeding difficulties and poor nutritional status. Careful evaluation and monitoring of severely disabled children for nutritional problems are warranted because of the increased risk of nutrition-related morbidity and mortality. ***JPGN 43: 123 –135, 2006.*** **Key Words:** Feeding intolerance—Developmental delay—Oral motor therapy—Enteral feeding tube. © 2006 Lippincott Williams & Wilkins

Case Presentation

Active Rehabilitation in a Pediatric Extracorporeal Membrane Oxygenation Patient

Carleen Zebuhr, MD, Amit Sinha, MD, Heather Skillman, MS, RD, CSP, CNSC, Shannon Buckvold, MD

Decreased intensive care unit (ICU) mortality has led to an increase in ICU morbidity. ICU-induced immobilization plays a major role in this morbidity. Recently, ICU mobility has been shown to be safe and effective in adolescent and adult patients. We report the successful rehabilitation of an 8-year-old boy with severe acute respiratory distress syndrome on extracorporeal membrane oxygenation. A child who is critically ill may safely perform active rehabilitation while on venovenous extracorporeal membrane oxygenation. The gains achieved through active rehabilitation and optimal nutrition can facilitate recovery from severe acute respiratory distress syndrome in select pediatric patients on extracorporeal membrane oxygenation.

PM R 2014;6:456-460

Obesidade – problema século XXI

Primeira causa de doenças crônicas no mundo

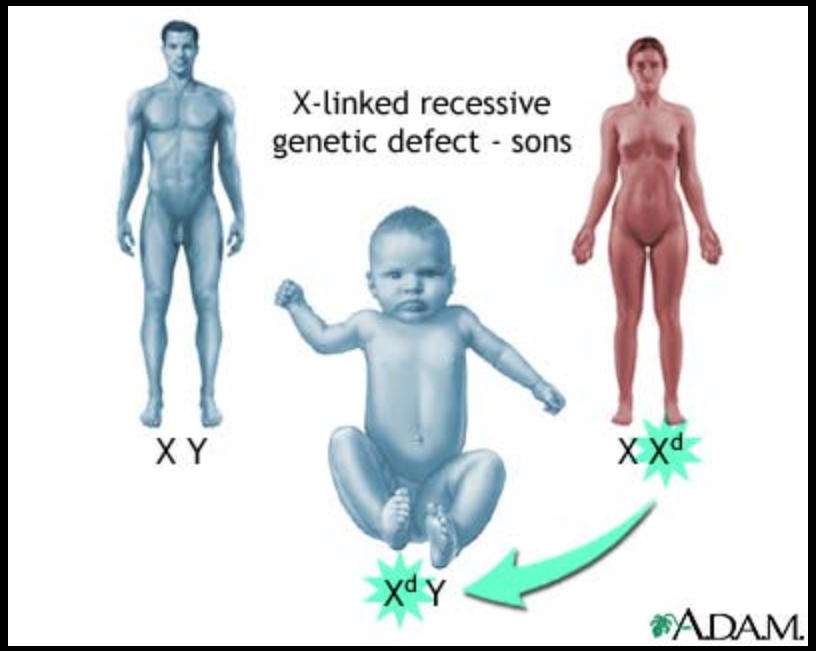
- ✓ **Doença cardiovascular**
- ✓ **Dislipidemia**
- ✓ **Diabetes Mellitus**
- ✓ **Hipertensão**

Prevalência: 6,7 milhões de crianças e adolescentes obesos; 7,6 sobrepeso; cresceu 240% nos últimos 20 anos

Obesidade Infantil e Cirurgia

Etiologia da Obesidade

- ✓ Fatores genéticos
- ✓ Fatores metabólicos
- ✓ Fatores nutricionais
- ✓ Fatores psicossociais



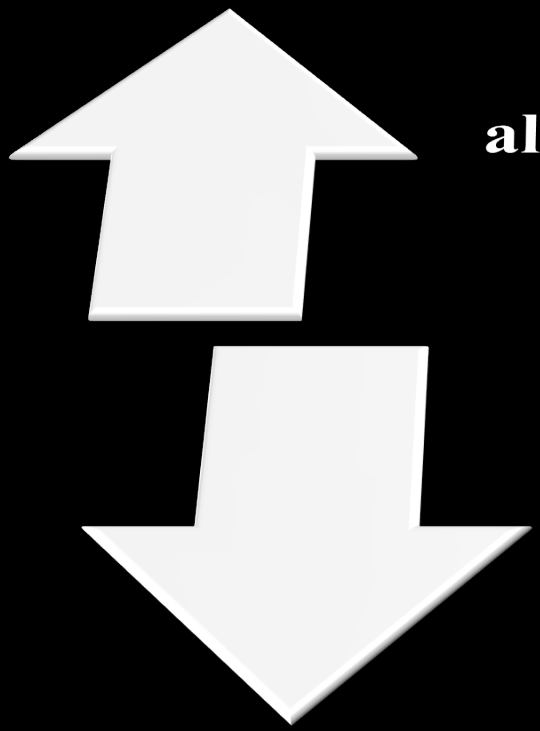
Etiologia da Obesidade

- ✓ Pais obesos – 80% chance
- ✓ 1 pai obeso – 40% chance
- ✓ 50% crianças obesas aos 6 meses – obesidade na fase adulta
- ✓ 80% crianças obesas aos 5 anos – obesidade na fase adulta

Engenharia de alimentos e obesidade

Criança que come em casa ingere 130 calorias a menos por refeição do que quando come “fast food” em resutaurantes

Nutrição e Obesidade



Excesso de consumo de alimentos ricos em açúcares e gorduras.

Baixa ingestão de produtos lácteos, frutas e hortaliças.

Conceição et al., 2010; Leal etal.,2010

Nutrição e Obesidade

FRACIONAMENTO

- Crianças que comem com mais frequência também se exercitam mais e fazem escolhas alimentares mais saudáveis.
- O fracionamento alimentar é uma estratégia eficiente para evitar o aumento do IMC.

Croll et al., 2006; Franko et al., 2008

Nutrição e Obesidade

Summary of strength of evidence on factors that might promote or protect against weight gain and obesity[a]

Evidence	Decreased risk	No relationship	Increased risk
Convincing	Regular physical activity High dietary intake of NSP (dietary fibre)[b]		Sedentary lifestyles High intake of energy-dense micronutrient-poor foods[c]
Probable	Home and school environments that support healthy food choices for children[d] Breastfeeding		Heavy marketing of energy-dense foods[d] and fast-food outlets[d] High intake of sugars-sweetened soft drinks and fruit juices Adverse socioeconomic conditions[d] (in developed countries, especially for women)
Possible	Low glycaemic index foods	Protein content of the diet	Large portion sizes High proportion of food prepared outside the home (developed countries) "Rigid restraint/periodic disinhibition" eating patterns
Insufficient	Increased eating frequency		Alcohol

WHO/FAO, 2002

Aumento do tamanho das porções - Consumo de bebidas adoçadas com açúcar

- 56-85% de crianças e adolescentes em idade escolar consomem pelo menos um refrigerante por dia.
- O aumento da obesidade na adolescência ocorre concomitante ao aumento do consumo de bebidas adocicadas.

Table 2 Introduction of new sizes in soft drinks

Company	Product	Volume (ml)	Introduction in The Netherlands
Coca Cola	Cola (multiple-serve bottles)	750*	1957
		1000	1968
		1500	1978
		2000†	1993
	Cola (single-serve bottles/cans)	192/200‡	1928
		296§	1960
		250‖	1966
		330	1963
		500	1981
		150¶	1992
Pepsi Cola	Cola (multiple-serve bottles)	750**	1959
		1000	1968
		1500	1986
		2000††	1993
	Cola (single-serve bottles/cans)	330	1971
		500	1996

Aumento de 2,67 X

Aumento de 2,67 X

Harrington S., 2008; Steenhus; Leeuwis; Vermeer; 2010

Aumento do tamanho das porções

Table 3 Introduction of new burgers at McDonalds and Burger King

Company	Product	Weight in 2008 (g)*	Introduction in The Netherlands	kJ (kcal) in 2008
McDonalds	Hamburger	108	1971	1067 (255)
	Big Mac	225	1971	2071 (495)
	Quarter Pounder	208	1987	2113 (505)
	Big Tasty	358	2003	3703 (885)
Burger King	Whopper	274	1981	2621 (624)
	Whopper Double	356	1981	3613 (863)
	Big King	209	1999	2460 (590)
	Big King XXL	363	2001	4301 (1030)
	Whopper Triple	436	2006	4508 (1075)

Aumento de 3,31 X

*No information is available about the weight of the products at the year of introduction.

Steenhus; Leeuwis; Vermeer; 2010

Alimentação na Adolescência e Obesidade

Aumento do tamanho das porções

O fornecimento de grandes porções leva a um aumento do consumo energético.

Rolls; Morris ; Roe, 2002; Rolls; Roe; Kral et al., 2004; Rolls; Roe; Meengs et al., 2004

Educação Alimentar

A educação em saúde não deve transmitir apenas informações, no entanto as atividades estratégicas e programas específicos precisam desencadear mudanças de comportamento do indivíduos.

Candeias, 1997

International Journal of
EXERCISE SCIENCE

Invited Editorial

Physical Activity and Physical Fitness in Pediatric Obesity: What are the First Steps for Clinicians? Expert Conclusion from the 2016 ECOG Workshop

GRACE O'MALLEY[1,2,3,4], SUSANNE RING-DIMITRIOU[2,5], PAULINA NOWICKA[2,6,7], ANDREA VANIA[2,8], MARIE-LAURE FRELUT[2,9], NATHALIE FARPOUR-LAMBERT[4,10], DANIEL WEGHUBER[2,11,12], and DAVID THIVEL[2,13,14,15]

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Tratamento da obesidade - Estratégias

O'MALLEY et al. International Journal of Exercise Science 10(4): 487-496, 2017

Table 1. Self-assessment for obesity practitioners on physical activity and fitness.

Steps	
1	**Determine how you define physical activity** *What does health-enhancing physical activity mean to me?*
2	**Identify a basic measure of the patients physical activity level** *Does my patient reach the daily physical activity recommendation for his/her age (>60 minutes of mod-vigorous activity per day for those 6-18 yrs; 3 hours per day for those <6 years)*
3	**Explore the determinants of physical activity for each patient** Family and peers: *For how many days per week and for how many minutes each day does the child engage with family members or friends in active play, sport, exercise or active hobbies?* Environment: *Are there safe areas for the child to play (e.g. parks, cycling tracks or games areas near the home or school)? How far from school does the patient live? How does he/she go to school every day (cycling, walking, bus, car)?*
4	**Identify the time devoted to sedentary behaviors** *How many minutes/hours does your patient report sitting each day? For how many minutes/hours does the patient use screens (TV, laptop, smartphone, tablet, video console, Internet) per weekday and weekend day?*
5	**Determine whether there are barriers to movement:** *Does your patient report any difficulties in performing childhood activities of daily living (e.g. climbing stairs,*
6	**Determine whether additional assessment and treatment will be required:** *Do you have any indication that the child has physical or psychosocial barriers that might limit participation in physical play? Do you have access to a physiotherapist or exercise physiologist who can provide assessment and treatment? Are you aware of evidence-based childhood obesity treatments/interventions in your area?*

O'MALLEY et al. International Journal of Exercise Science 10(4): 487-496, 2017

ATIVIDADE FÍSICA E EXERCÍCIO RESPIRATÓRIO REDUZ O RISCO DE ANSIEDADE, DEPRESSÃO E PÂNICO

IMPACTO NO TRATAMENTO DA OBESIDADE

LOPRINZI PD et al. POSTGRAD MED 2017

Isolamento e desocupação e o comer compulsivo

Criança obesa tem menos amigos que os demais

Isolamento social – Terapia ocupacional

20% dos adolescentes consideram o suicídio

9% dos adolescentes já tentaram o suicídio

Entende-se por **terapeuta ocupacional**, o profissional da terapia ocupacional, uma ciência humana que tem por objetivo promover o bem-estar trabalhando os âmbitos cognitivo, psicológico, social, físico e sensorial de forma integrada, tendo como ferramentas de atuação as atividades físicas, psicomotoras, laborais e lúdicas.

Obesidade

obesity reviews

doi: 10.1111/obr.12478

Pediatric Obesity/Management

Barriers and facilitators to initial and continued attendance at community-based lifestyle programmes among families of overweight and obese children: a systematic review

E. Kelleher,[1] M. P. Davoren,[1] J. M. Harrington,[1] F. Shiely,[1,2] I. J. Perry[1] and S. M. McHugh[1]

Table 4 Summary of facilitators and barriers to initial and continued attendance

	Predictors of attendance	Facilitators	Barriers
Initial attendance	- Gender (28, 33, 39)	- Parental concern for child's psychological wellbeing (30–32, 35–37) - Social interaction (30, 32, 35) - Lifestyle-focused approach (30, 32, 35) - Family-centred approach (30, 36)	- Stigma (30–32, 38) - Denial (30, 32, 38) - Personal and programme logistics (29, 30, 32–34)
Continued attendance	- Gender (28, 39) - Ethnic minority (29, 39, 40) - Lone parent families (28, 40) - Families living in lower socioeconomic areas (28, 39)	- Social interaction and support (30–32, 34, 36, 38, 39) - Practical sessions (30, 35, 36, 38) - Family-centred approach (30, 31, 33, 36, 38) - Programme staff (31, 36, 37)	- Personal circumstances and logistics (29–33, 36) - Programme staff (31, 37)

British Journal of Health Psychology (2016), 21, 407–420

The British Psychological Society

www.wileyonlinelibrary.com

Kids just wanna have fun: Children's experiences of a weight management programme

Libby A. Watson*, Martyn C. Baker and Paul M. Chadwick

School of Psychology, University of East London, UK

Objectives. To explore children's accounts of their experiences of the UK's largest childhood obesity programme, MEND (Mind, Exercise, Nutrition. . .Do it!) (See www.mendprogramme.org).

Design. Semi-structured interviews were conducted with children who had completed the MEND obesity programme. Interviews were transcribed verbatim and analysed using Interpretative Phenomenological Analysis (IPA).

Method. Fourteen children spanning diverse areas of London comprised this study (eight male, six female), aged between 11 and 14 years and in secondary school. Participants were interviewed a year after completing one of the London-based MEND obesity programmes.

Results. This article focuses on the most common and striking theme to emerge from the original dataset (The complete analysis may be found in L. Watson, Unpublished doctoral thesis): Fun. Subthemes were: 'going with the flow'; active participation in activities that led to new experiences ('actually doing it' – seeing the fun side); the importance of others in the experience of fun ('you do games in unity' – 'it's not as fun on your own').

Conclusion. Children have fun when engaged in interactive and varied activities with opportunity for individual feedback and improvement. When designing childhood obesity programmes, conditions that optimise children's experience of fun should be emphasised over didactic and risk-heavy information pertaining to childhood obesity.

Table 3. Table of themes[a]

Superordinate theme	Subtheme	Description
1. Fun	'Going with the flow'	Fun was experienced through active *doing*, which brought variety and new meaning to activities
	'Actually doing it' – seeing the fun side	The experience of fun was procedural and automatic, diverting the self from negative feelings and contrasting with effortful thinking
	'You do games in unity' – 'It's not as fun on your own'	Fun was also experienced as energizing. This was in anticipation of doing activities with others, considered integral to the fun that was experienced
2. The power and influence of others	a. Family influence and support	Family influenced certain behaviours and feelings, through varying degrees of enforcing change and providing emotional support.
	b. Peers: 'like me'	Peers influenced self-concepts, feelings, and behaviours. Participants strived to be *liked*, as well as to be *like* their peers. Healthy behaviour could be supported and enabled by peers, but also be counteracted by 'peer pressure'
3. The changed self	a. 'We learnt quite a lot of new things'	What they knew changed: They learnt what to do to help themselves (e.g., lose weight/become healthy). It made them 'actually think'
	b. 'I could tell I was changing'	Participants noticed they were changing through applying what they had learnt. This included differences in mindset, behaviours, and feelings
	c. 'There were changes'	Changes external to the self, which affected the self, were experienced and reflected upon. They felt that certain changes were beyond their control, such as events that happened and growing up

[a]From Watson (2011).

clinical obesity

doi: 10.1111/cob.12202

Walking in the shoes of caregivers of children with obesity: supporting caregivers in paediatric weight management

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Summary

To incorporate the perspectives and experiences of family caregivers of children with obesity, the KidFit Health and Wellness Clinic, a paediatric weight management programme, embedded feedback opportunities into various stages of programme development. Caregivers were eligible to participate if their children had completed initial 4-week group-based pilot programming or were currently receiving treatment in 10 or 12 week group-based programming. Data were collected through feedback session discussions, audio-recorded, transcribed verbatim and analysed thematically. In total, 6 caregivers participated in the pilot group feedback session and 32 caregivers participated in the structured group feedback sessions. Caregivers reported that healthy lifestyle strategies first communicated by clinic staff to children during group sessions provided expert validation and reinforcement when discussing similar messages at home. Caregivers reported feeling isolated and blamed for causing their children's obesity and appreciated the supportive forum that group-based programming provided for sharing experiences. Since experiences of blame and isolation can burden caregivers of children with obesity, paediatric weight management programmes might consider including peer support opportunities and discussion forums for ongoing social support in addition to education about lifestyle change.

Keywords: Paediatric obesity, patient-engagement, quality improvement, stigma.

Equipe interdisciplinar