

Risk Factors for Malnutrition in Children admitted to Port Moresby General Hospital (PMGH)

D. Olita'a
DCH - 2013

Background

Malnutrition

- One of the most common causes of morbidity & mortality among children throughout the world, more so in developing nations
- About one third of under 5 mortality is attributable to malnutrition
(UNICEF. Improving Child Nutrition-The achievable imperative for global progress)

- Estimated prevalence of children < 5 affected in developing countries in 2011:
 - 17% underweight
 - 28% stunted
 - 8.8% wasted

(UNICEF-WHO-The World Bank Joint Child Malnutrition Estimates)
- PNG
 - 28% of children considered moderately - severely malnourished
 - 31% of children aged 0-5years of age are stunted

(PNG country health information profiles)

- Studies have been done globally & in PNG to determine risk factors for malnutrition
- Factors such as poor infant feeding practices, education levels of parents & low social class status to name a few have been identified as risk factors

AIM

To determine risk factors associated with malnutrition in children admitted to PMGH

OBJECTIVE

Identify risk factors in our setting so that we can develop appropriate strategies and recommendations to alleviate this problem

METHOD

- Case-control study @ Paediatric wards (PMGH) over 5 months
- Data collection
 - Pretested structured questionnaire
 - Anthropometric measurements
- Data analyzed using SPSS version 10 & Epi info stat calc

Inclusion Criteria

- **Cases**

- Children aged between 1 - 60months
- Children admitted for malnutrition (WFA < -2 SD & -3 SD from the median of the WHO Child Growth Standards & with or without presence of edema)

- **Controls**

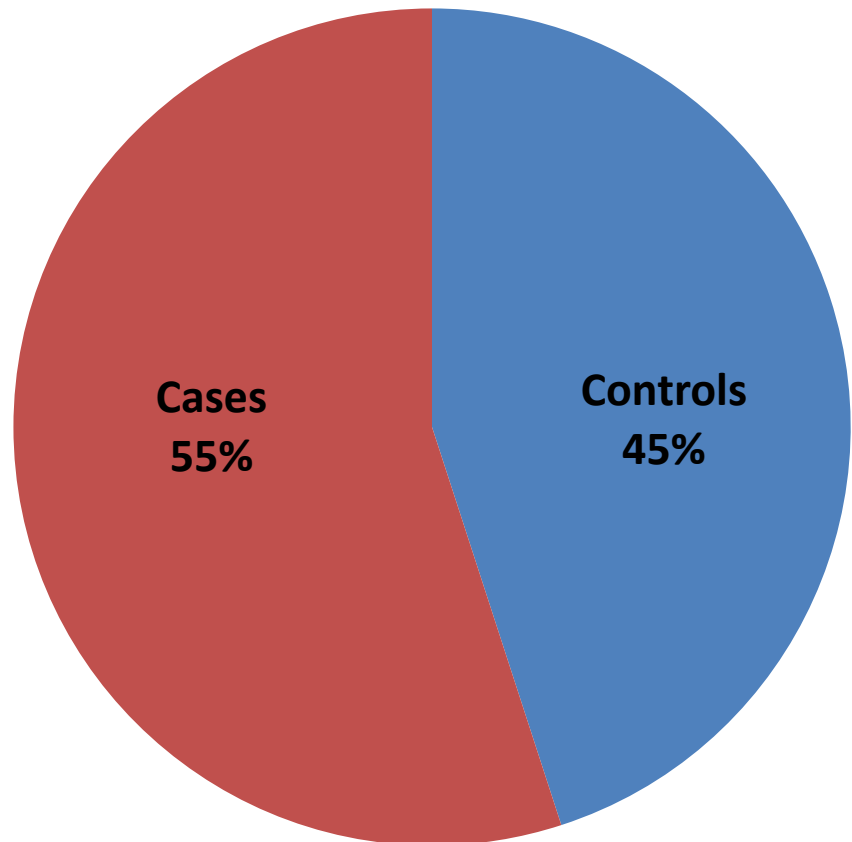
- Children age-matched to each case (± 1 month)
- Children who are well nourished (WFA > -2 SD from the median of the WHO Child Growth Standards)
- Children admitted for other acute medical problems

Exclusion Criteria

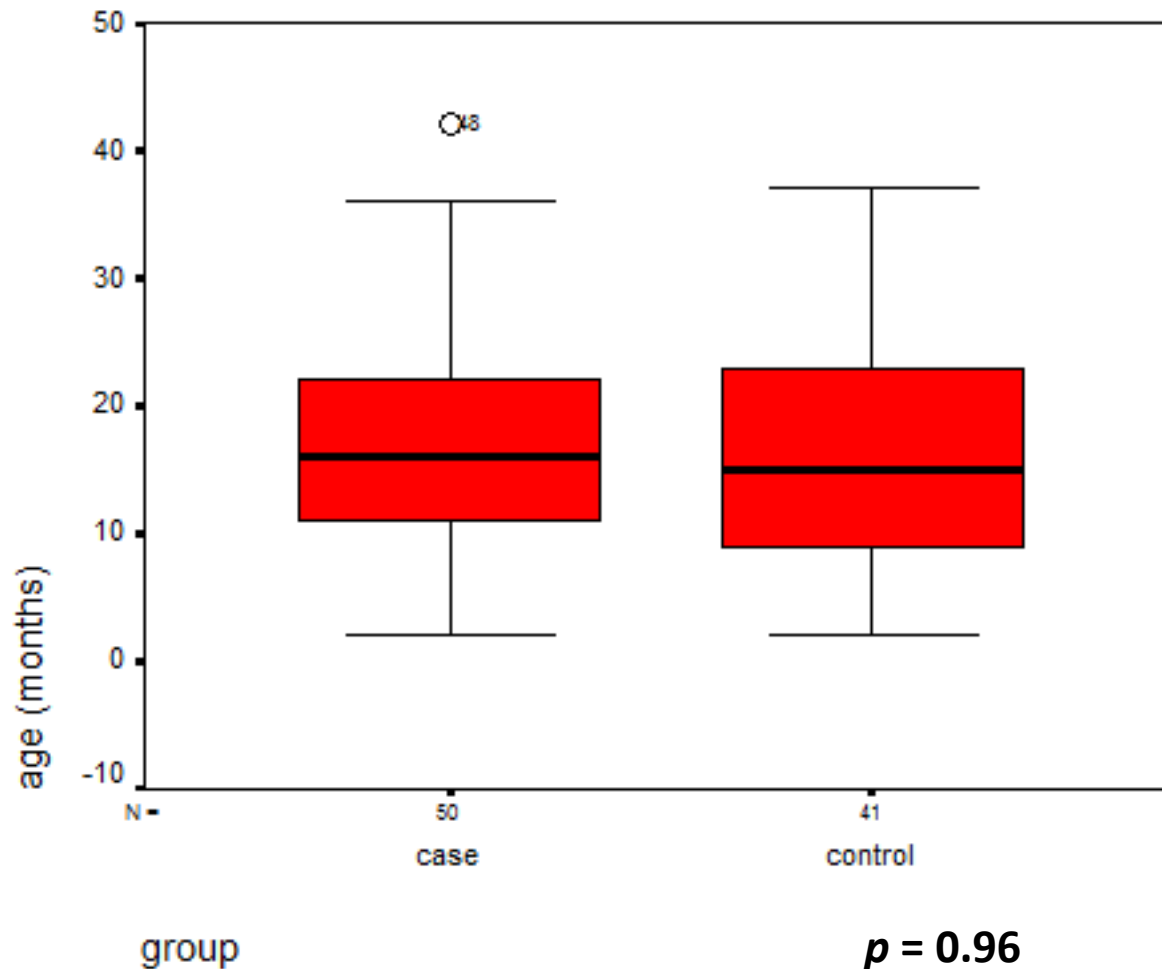
- Children with TB, RVI, malignancies and congenital anomalies

RESULTS

- Total of **91** patients recruited
 - Cases = 50
 - Controls = 41



Age distribution

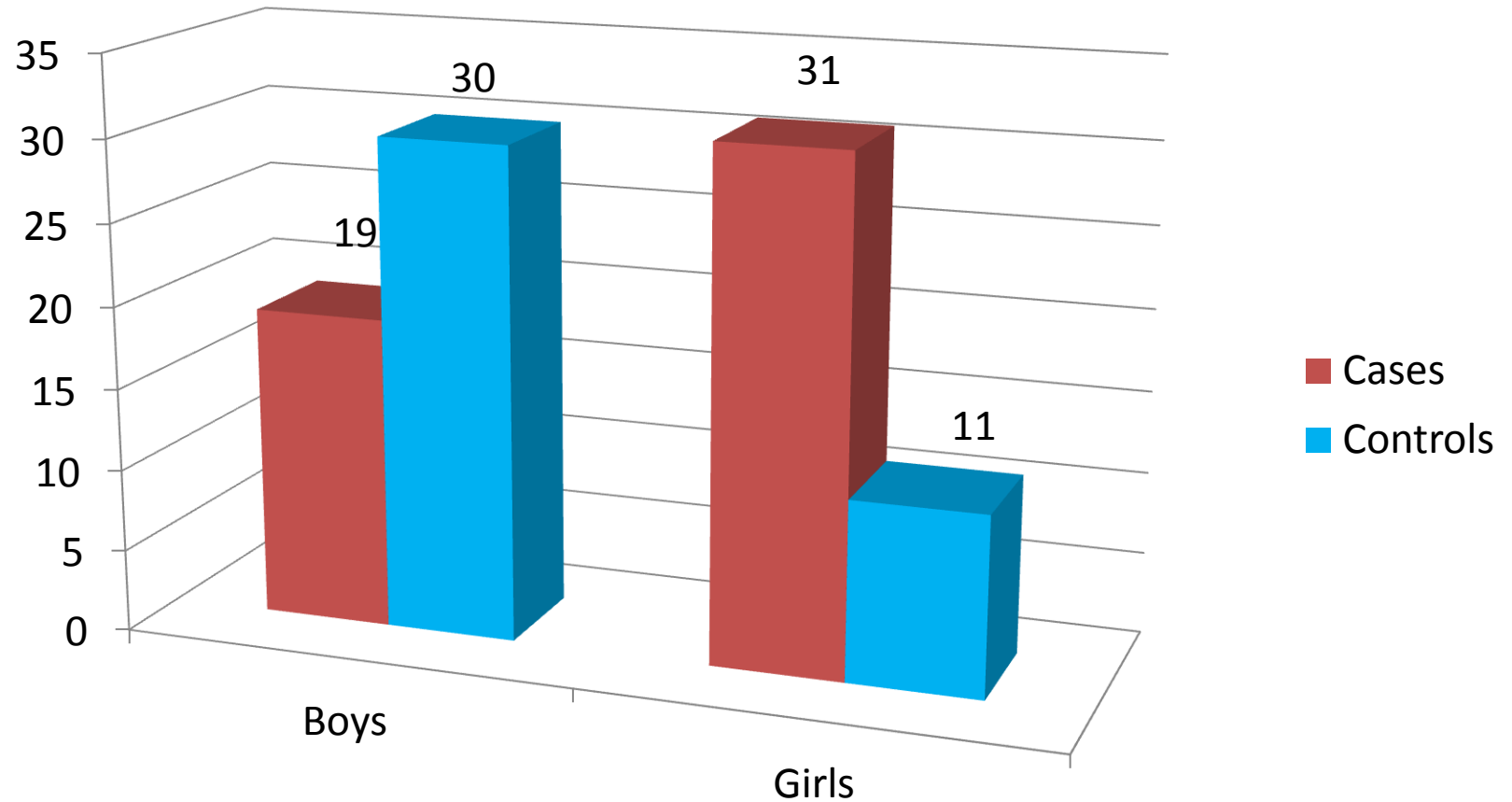


Mean age

Cases – **16.8** (± 1.12)

Control – **16.7** (± 1.4)

Sex distribution



OR = 4.45 (95% CI 1.67 – 12.12)

$p = 0.001$

Anthropometry

Table showing mean basic anthropometric measurements

Measurement	Cases	Controls	p-value
Weight (kg)	6.22 (± 1.51)	10.23 (± 5.08)	0.000
Height (cm)	70.23 (± 6.91)	74.64 (± 13.99)	0.053
MUAC (cm)	10.89 (± 1.43)	14.31 (± 0.85)	0.000

Table showing Z scores for cases (n=50)

	< -3SD	-2SD&-3SD	>-2SD
WFA (underweight)	38 (76%)	12 (24%)	0
HFA (stunting)	29 (58%)	17 (34%)	4 (8%)
WFH (wasting)	18 (36%)	20 (40%)	12 (24%)

➤ 18.7% of cases had edema

Child-related factors/Feeding Practices

Variable	Case (n=50)	Control (n=41)	OR (95% CI)	p-value
LBW (<2.5kg) yes no	8 22	2 33	6. (1.0-45.5)	0.02
Adopted yes no	4 46	1 40	3.5(0.34-85.21)	0.37
Feeding method breastfed bottlefed	42 8	36 5	0.73(0.19-2.76)	0.61

Variable	Cases(n=50)	Control(n=41)	OR (95%CI)	p-value
Lack of exclusive breast feed in first 6 months				
yes	16	12	1.25(0.42-3.07)	0.78
no	34	29		
Early introduction of complementary feeds				
yes	16	12	1.13(0.42-3.07)	0.79
no	33	28		
Late introduction of complementary feeds				
yes	15	9	1.52(0.52-4.43)	0.4
no	34	31		
Immunisation				
Complete	13	26	4.93(1.84-13.45)	0.000
Incomplete	37	15		

Variable	Cases(n=50)	Control(n=41)	OR(95% CI)	p-value
Previous hospital admission				
yes	11	12	0.68(0.24-1.95)	0.43
no	39	29		
Position in family				
first	4	1	3.48(0.34-85.21)	0.37
middle	2	1	1.67(0.11-48.32)	1.00
last	35	29	0.97(0.35-2.62)	0.94
only	9	10	0.68(0.22-2.09)	0.46
Birth interval $\leq$ 2years				
Yes	20	9	3.33(1.05-10.82)	0.02
No	14	21		

Parental Factors

Mother related factors

Variable	Cases(n=50)	Controls(n=41)	OR(95%CI)	p-value
Age	25.4 (±5.12)	27.8(±5.4)	-	0.03
Education level				
No formal	15	5		
Primary	27	20		
Secondary & above	8	16	6.00(1.35-28.50)	0.006
Occupation				
Unemployed	39	32	1.00(0.33-3.01)	1.00
Employed	11	9		
Health status				
Pregnant	7	3	2.06(0.43-10.94)	0.50
Healthy	43	38		

Father related factors

Variable	Cases(n=50)	Controls(n=41)	OR(95%CI)	p-value
Age	31.1(±5.1)	33.4(±7.0)	-	0.23
Education level				
No formal	8	3		
Primary	13	13	2.67(0.47-16.50)	0.28
Secondary & above	23	20	2.32(0.46-12.93)	0.32
Occupation				
Unemployed	20	8	3.06(1.06-9.01)	0.02
Employed	27	33		

Environmental/Social Factors

Variable	Cases(n=50)	Controls(n=41)	OR(95%CI)	p-value
Area of residence				
Rural	9	4	7.65(1.32-50.19)	0.007
Urban settlement	36	20	6.12(1.76-22.56)	0.000
Urban town	5	17		
Housing				
Semi-permanent	44	22	6.33(2.00-20.89)	0.000
Permanent	6	19		
Type of toilet				
Septic	12	12		
Pit	24	26	1.08(0.32-3.20)	0.87
Others	14	3	4.67(0.89-27.29)	0.04
Water supply in the house				
No	31	17	3.98(1.43-11.25)	0.003
Yes	11	24		
Number of people in household	9.62(±5.20)	8.10(±4.96)		0.112

DISCUSSION

- 76% of cases had severe malnutrition
- 24% of cases had moderate malnutrition
- More females affected

- Comparable significant risk factors
 - LBW
 - Poor immunisation status
 - Close birth interval
 - Mothers age, education & marital status
 - Father's employment
 - Area of residence(rural/settlement)
 - Poor housing
 - Poor toilet facilities
 - Lack of water supply

- Factors not significant in the study but significant in other studies included:
 - Adoption
 - Bottlefed
 - Lack of exclusive breastfeeding for 6mnths
 - Early or late introduction of complementary feeds
 - Fathers education
 - Large household

CONCLUSION

- Mother's low education level, father's lack of employment and being generally of the lower social class (poor housing, sanitation, living in settlements) and being a LBW infant were all significantly associated with malnutrition.
- Mother's education level would have also impacted on the child's immunisation status and her ability to choose how to space her family, which were also significantly associated with malnutrition.

RECOMMENDATIONS

- Women need to have equal opportunities at education and encouraged to go beyond primary education ; education enhances knowledge & equips with decision-making power
- Family planning services need to better advocated and more widely dispersed
- Improve nutritional status of mothers before & during pregnancy

- Improve access to clean drinking water
- Improve sanitation – create environments free of open defecation
- Improve access to and use of health services
- Rural to urban migration should be strictly controlled with better service provision to those already living in settlements

LIMITATIONS

- Small sample size
- Unequal number for the groups (cases/control)
- Some other factors contributing to malnutrition not looked for in this study

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ACKNOWLEDGEMENTS

- Professor Vince
- Prof Tefuarani
- Fellow colleagues
- Paediatric Nursing staff

Thank you!!!!