DCH Research Project

Prevalence and risk factors for malnutrition in children attending urban clinics in Goroka, EHP

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Introduction

- Malnutrition a huge burden in child population in EHP
- Goroka Provincial Hospital, 2548 children (10.2%) of all admission

(PHR, 2018, PNG NDOH)

- PMGH 4893 children (8.4%)

(PHR, 2018, PNG NDOH)

- Hospital based studies do not indicate community prevalence
- Study was designed to investigate the burden of malnutrition in children in Goroka, EHP

Literature Review

- Undernutrition during first 1000 days of life, closely associated with childhood illness & poor cognitive development.
- Growth stunted children have increased mortality risks later in life; obesity, coronary heart disease and type 2 diabetes

(Gillespie et al. 2003. Sage Publications)

- In PNG malnutrition not only due to *food insecurity but low rates of exclusive breast feeding (6/12), suboptimal feeding practises, poor water and sanitation.*
- *Other factors, poverty, large families, incorrectly instituted infant formulae.*

(Marjell et al. 2017. Frontier Economics)

Literature Review

- 45% of all worldwide deaths due to malnutrition (WHO)
- 43.9% stunted, 4.5% wasted and 18.1% underweight

(PNG NNS, 2005).

- 46% stunted, 15.8% wasted and 25% underweight

(PNG HIES, 2010)

- Highlands regionally, undernutrition 24.97%, stunting rates (61.5%)

(HIES, 2010)

- EHP stunting 59%, underweight 29%, wasting 14%

(Wand et al. 2012, BMC Research Notes)

Objectives

1. Investigate prevalence of malnutrition of children attending outpatient clinics in Goroka District.

2. Assess factors contributing to malnutrition

3. Identify comorbidities with malnutrition

Methods

Study setting: Urban clinics in Goroka District

- Seigu Susu Mamas
- North Goroka
- Lopi Clinic

Study design:

- Cross sectional study of the prevalence of Malnutrition amongst children between ages 6 months – 5 years attending these clinics

Subjects – Inclusion and Exclusion criteria:

- Consecutive children ages 6 months to 5 years attending the urban outpatient clinics.
- Verbal consent was obtained from caregivers

Methods

Sample size:

- 204 patients

Study instruments:

- Patient bio data form, questionnaire survey form, weighing scale, height scale, WHO Growth Chart

Data collection:

- 3 clinics visited during opening days and all patients meeting inclusion criteria were screened for malnutrition.
- Data was collected using questionnaire on patients demographic information, background socioeconomic status, water and sanitation, past medical history

Methods

Data Analysis and Interpretation

- MS Excel
- Stata

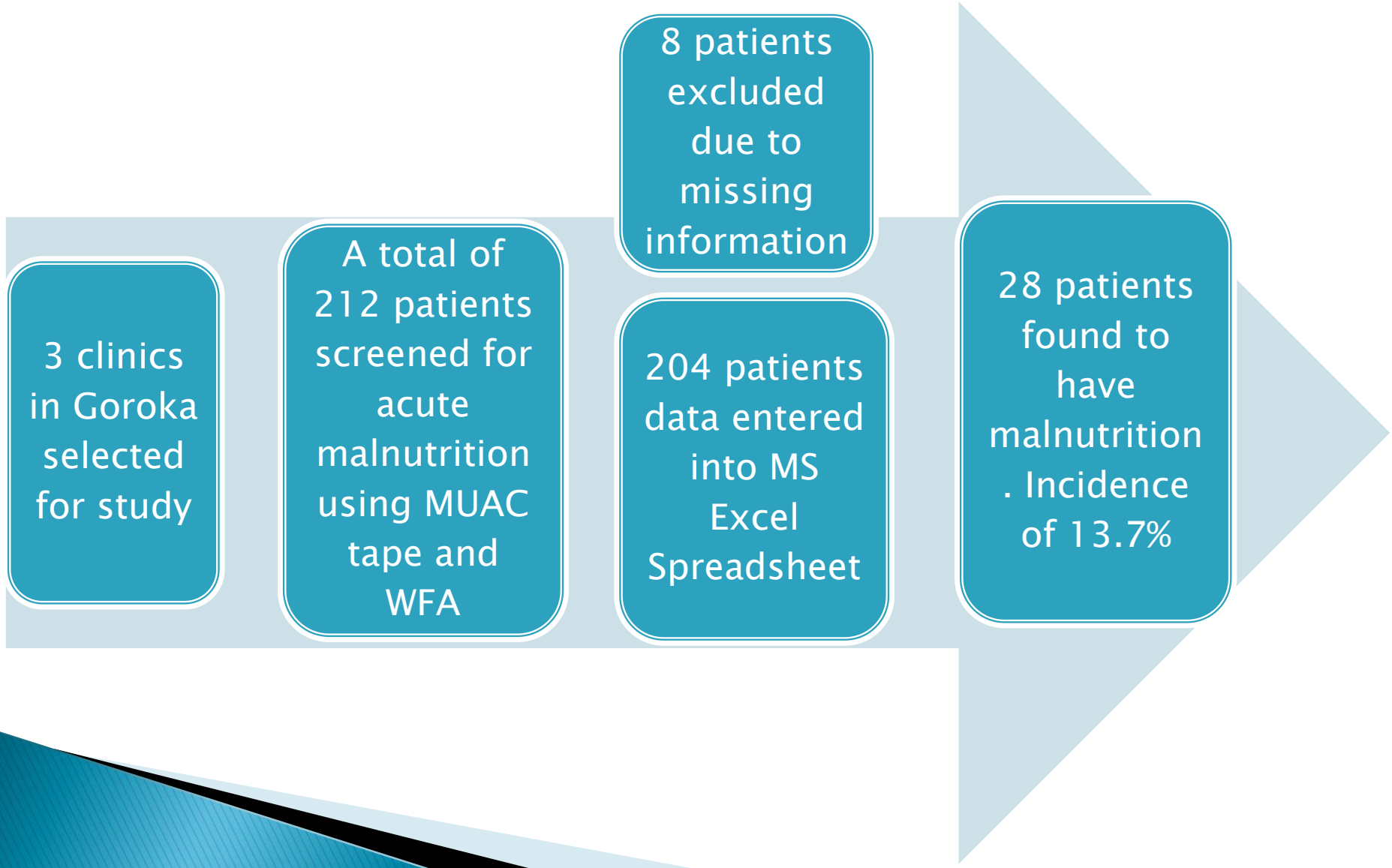
Ethical consideration

- Approval was sought from the Goroka Provincial Hospital, Ethics Committee.

Time frame and schedule of activities:

- Data collection: May – June
- Data Entry: July
- Data analysis: August - October

Timeline of Study



Demography

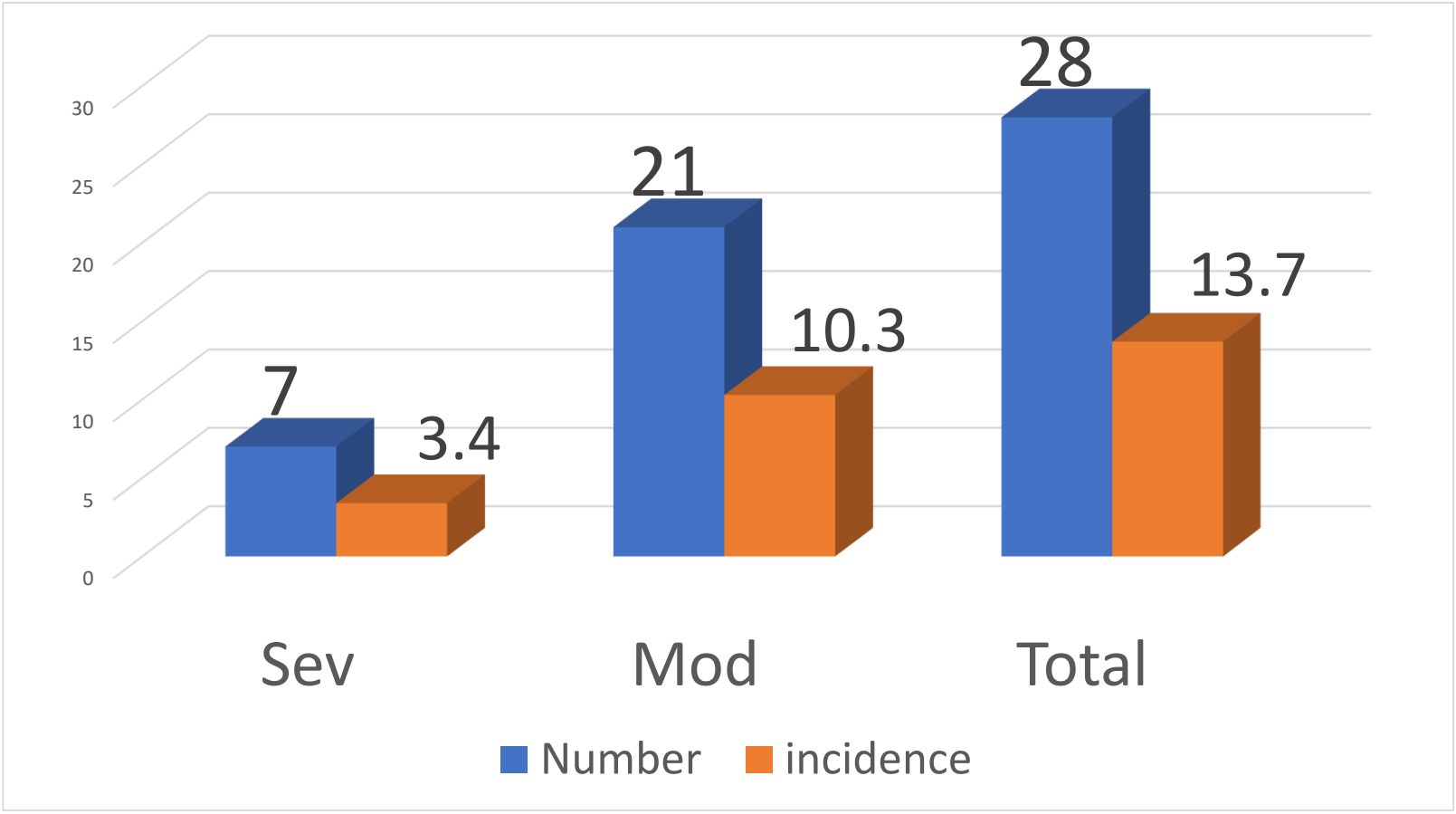
Variable		Total patients (%)	All malnutrition (%)	Severe malnutrition (%)
Sex	Male	111 (63)	12 (43)	2 (29)
	Female	65 (37)	16 (57)	5 (71)
Age Distribution	6-24	116 (66)	18 (64)	6 (86)
	25-42	44 (25)	8 (29)	0 (0)
	43-60	16 (9)	2 (7)	1 (14)
Residence	Settlement	67 (38)	7 (25)	3 (43)
	Rural	61 (35)	4 (61)	0 (0)
	Urban	48 (27)	17 (14)	4 (57)

- Place of Origin:
  72% – EHP
  17% – Simbu
  <10% – Others

- Cases

95% – EHP (Goroka, Lufa, Unggai/Bena, Henganofi, Okapa, Kainantu)

Prevalence of malnutrition along population n=204



Associated factors

	Variables	All patients (%)	Malnutrition (%)	Severe malnutrition (%)
	Water, hygiene and sanitation			
Water source	River	62 (30.4)	12 (43)	4 (57.1)
	Well	21 (10.3)	2 (7.1)	1 (14.3)
	Tank	24 (11.8)	4 (14.3)	1 (14.3)
	Tap	97 (47.5)	10 (35.7)	1 (14.3)
Sanitation	Septic	13 (6.4)	3 (10.7)	1 (14.3)
	Pit	190 (93.1)	25 (90.3)	6 (85.7)
	River	1 (0.5)	0 (0)	0 (0)

Associated factors

	Variables	All Patients (%)	Malnutrition (%)	Severe malnutrition (%)
	Feeding practises			
Feeding practises	Breast fed	197 (96.6)	28 (100)	7 (100)
	Infant	6 (2.9)	0 (0)	0 (0)
	Others	1 (0.5)	0 (0)	0 (0)
Introduction of first feed	<6 months	54 (26.5)	9 (32.1)	3 (42.9)
	>6 months	150 (73.5)	19 (67.9)	4 (57.1)

Associated factors

Variables		All Patients (%)	Malnutrition (%)	Severe Malnutrition (%)
Education	Nil	43 (21.1)	5 (17.9)	1 (14)
	Primary	82 (40.2)	10 (35.8)	4 (57)
	Secondary	68 (33.3)	11 (39.3)	1 (14)
	Tertiary	11 ((5.4)	2 (7.1)	1 (14)
Marital Status	Single (Divorce, Widowed)	12 (10.3)	3 (10.7)	7 (100)
	Married	192 (89.7)	25 (89.3)	0 (0)
Adoption Status	Yes	19 (9.3)	3 (9)	2 (28.6)
	No	185 (90.7)	25 (91)	5 (71.4)
Family size	1-2	130 (63.7)	18 (64.3)	5 (71.4)
	>/3	74 (36.3)	10 (35.7)	2 (28.6)

Risk factors

Risk factors for malnutrition	Cases (n =28)	Controls (n=176)	Odds ratio	Confidence Intervals	p- value
Female sex	12	65	1.28	0.58 - 2.84	0.54
Age 6-24 months	18	116	0.93	0.41 – 2.10	0.87
Residence in rural area	**17**	**61**	**2.91**	**1.30 – 6.51**	**0.008**
Residence in urban suburb	4	48	0.44	0.15 – 1.29	0.14
Single parent	3	9	2.22	0.61 – 8.21	0.24
Adopted child	3	16	0.8	0.0 – 0.34	0.77
River as source of water	12	50	1.89	0.85 – 4.22	0.12
Partially vaccinated child	9	47	1.30	0.56 – 3.03	0.55
Introduction of first feed < 6 months	9	45	1.38	0.59 – 3.22	0.46
Village delivery	**7**	**19**	**2.75**	**1.06 – 7.19**	**0.04**
Hospital delivery	**21**	**157**	**0.36**	**0.14 – 0.94**	**0.04**

Comorbidities

	All Malnutrition (%)	Severe Malnutrition (%)
Respiratory Illness	8 (28.6)	5 (71.4)
Gastro – intestinal Illness	4 (14.3)	0 (0)
Vaccines	4 (14.3)	0 (0)
CNS	1 (3.6)	0 (0)
Immuno – deficiency	2 (7.2)	1 (14.3)
Skin infections	2 (7.2)	0 (0)
SAM	1 (3.6)	1 (14.3)
Others	1 (3.6)	0 (0)

Discussion

- High prevalence of malnutrition in urban clinics 14%
- Reflects a major community problem

- Similar results in previous studies:
  - Highlands region: 23%, PNG: 25%

  (PNG HIES, 2010)
  - 14% wasting, under nutrition: 29% in EHP

  (Wand et al. 2012, BMC Research Notes)
  - 16% wasting, 26% under-nutrition in Karawari, ESP

  (Samiak et al. 2017. PLoS ONE)

Discussion

Risk factors for malnutrition

- Rural children at high risk (35% vs 61%), OR: 2.91 (95% CI: 1.3–6.51, p=0.008)
- Village delivery (11% vs 25%) OR: 2.75 (95% CI: 1.06–7.19, p=0.04

"Protective" factors:

- Hospital delivery (89% vs 79%), OR: 0.36 (95% CI: 0.14–0.94, p=0.04)

Discussion

Characteristics that were not significant:

- River as primary source of drinking water (28% vs 43% OR: 1.89 (95% CI: 0.85–4.22, p=0.12)
- Female (37% vs 57% OR: 1.28 (95% CI: 0.58–2.84, p=0.54)
- Partially vaccinated (27% vs 32% OR: 1.3 (95% CI: 0.56–3.03, p=0.55)
- Introduction of first feed< 6 months. (26% vs 32% OR: 1.38 (95% CI: 0.59–3.22, p=0.46)

Discussion: other studies

- Children with malnutrition had higher chances of not being fully vaccinated

  (Samiak et al. 2017. PLoS ONE)

- Protective factor: having clean drinking water at home. Risk factors: mother's education (Nil- Grade 3), father's employment (unemployed, market seller) and father's education (Nil – Grade 3)

  (Olita'a et al. 2014. Journal of Tropical Paediatrics)

- High rates observed in Poorer immunisation, residence in rural/settlement location
- LBW, feeds < 3/day, spacing children < 2 years

Strengths and limitations

- Strengths
  - Urban clinics not hospital based, so better reflects the community
  - Sequential patients so not highly selected population, eliminates selection bias

- Limitations
  - Short time frame of study
  - Limited number of potential factors assessed
  - Reduced movement of patients due to Covid-19 lockdowns

Recommendations

- Improved recognition of moderate malnutrition needed among primary health care workers
- Improving socioeconomic living standards, access to clean drinking water and sanitation, and better feeding practises will lead to reduced rates of malnutrition in EHP

Conclusion

- Prevalence of malnutrition was 13.7% in urban clinics – a major community problem
- Risk factors associated with higher rates: village delivery and rural area residence
- Major improvements in public health, education and community nutrition will contribute to reducing the rates of malnutrition in EHP

Acknowledgements

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- Staff, North Goroka Clinic
- Staff, Lopi Clinic
- Professor Trevor Duke
- Patients studied

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