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Introduction

- Anaemia continues to be a global public health burden affecting all age groups, particularly children^{1,2}.
- Indigenous people, including the Orang Asli (OA) population in Malaysia, are at risk of anaemia due to the vast disparities in social determinants of health in their population.

Objective

To identify anaemia prevalence and risk factors among OA children in Malaysia and analyse the knowledge gaps.

Results

- Six out of 735 retrieved articles were included involving OA children from eight subtribes residing in Peninsular Malaysia.
- Anaemia prevalence among OA children:
 - ▲ Overall, ranged from 21.6 to 80%.
 - ▲ By age group:
 - ▲ Ranged from 21.6 to 80% for the 2-6 year age group.
 - ▲ Ranged from 41.0 to 70.4% for the 6-13 year age group.
 - ▲ Highest among Negrito tribe and lowest among the Proto-Malay tribe.
- Anaemia-specific prevalence:
 - ▲ Iron deficiency anaemia was 34.0%.
 - ▲ Two studies reported contrary findings on gender-specific prevalence.
 - ▲ Prevalence of mild anaemia was 12.9%.
 - ▲ Prevalence of moderate and severe ranged from 3.0 to 8.7%.
- Risk factors for anaemia identified from only one study were:
 - ▲ Age younger than ten adjusted OR 2.11 (95% CI 1.23, 3.63).
 - ▲ Moderate to heavy Ascaris infection adjusted OR 2.05 (95% CI 1.12, 3.76).
- Gaps identified on anaemia among OA children:
 - ▲ A limited data from available studies.
 - ▲ Absence of data from certain groups of OA children (age groups & subtribes).
 - ▲ A limited data on risk factors for anaemia identified.
 - ▲ A limited data on anaemia-specific prevalence reported.

Methods

- PubMed, Cochrane Library, Scopus, and Google Scholar databases were searched up until 30th of April 2022.
- Inclusion criteria:
 - ▲ Studies reported on the prevalence and/or risk factors of anaemia among OA children.
 - ▲ The data for OA children was reported separately from other populations.
 - ▲ Published between the years 2012-2022.
- Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR) guidelines was adapted.

Figure 1: Locality of Orang Asli children population participated in the studies

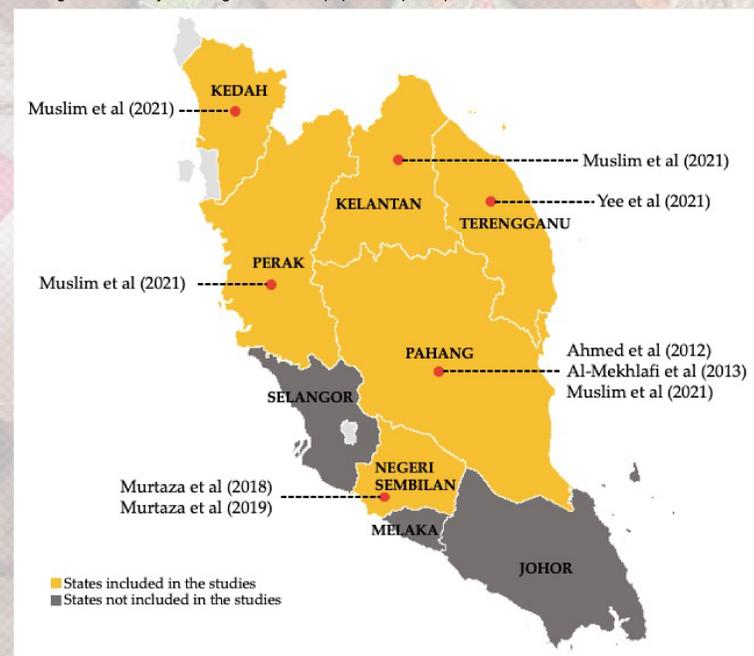


Figure 2: Tribes of Orang Asli children participated in the studies

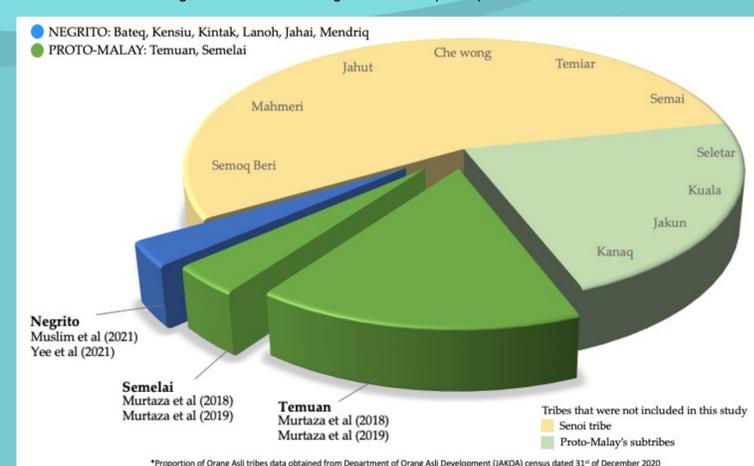


Table 1: Overall characteristics of included studies and anaemia-specific prevalence among OA children in Malaysia

Author(s) (Year)	Study design	Sample size	Age (Years)	Prevalence of anaemia (%)	Risk factors for anaemia	AOR (95% CI), p-value	IDA (%)	Gender-specific prevalence (%)		Anaemia Severity (%)		
								Male	Female	Mild	Moderate	Severe
Ahmed et al ³ (2012)	Cross-sectional Randomized	254	6 - 13	41.0	Age (<10 years) Ascaris Infections (Moderate-to-heavy)	2.11 (1.23, 3.63) p = 0.007 2.05 (1.12, 3.76) p = 0.021	NA	45.1	37.1	NA	NA	NA
Al-Mekhlafi et al ⁴ (2013)	Controlled Trial	250	7 - 12	48.5	NA	NA	34.0	NA	NA	NA	NA	NA
Murtaza et al ⁵ (2018)	Cross-sectional	264	2 - 6	21.6	NA	NA	NA	NA	NA	12.9	NA	8.7
Murtaza et al ⁶ (2019)	Cross-sectional	269	2 - 6	21.7	NA	NA	NA	NA	NA	NA	NA	NA
Yee et al ⁷ (2021)	Cross-sectional	77	7 - 12	61.6	NA	NA	NA	59.5	63.9	NA	NA	NA
Muslim et al ⁸ (2021)	Cross-sectional	196	2 - 12	Age 2-6: 80.0 Age 7-12: 70.4	NA	NA	NA	NA	NA	NA	NA	3.0

OA, Orang Asli; AOR, adjusted odds ratio; NA, not available; IDA, iron deficiency anaemia

Discussion

- The wide range of anaemia prevalence among OA children possibly due to the limited available data to represent this population or the existence of gaps in social determinants of health among the OA tribes.
- Lack of data on anaemia risk factors and anaemia-specific prevalence due to most studies had primary objective other than anaemia condition and poor reporting standard of data on anaemia.

Conclusion

- The prevalence of anaemia among OA children constitutes a moderate to serious public health issue.
- Despite multiple efforts taken by the Ministry of Health Malaysia, anaemia continues to be a burden among the OA population, primarily the children.

Acknowledgement

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Keywords

Anaemia, Indigenous, Orang Asli, children, Malaysia

Recommendations

- A huge research gap identified in this study urges for more comprehensive epidemiological study in the future to obtain more accurate data representing the OA children population in Malaysia in order to reduce morbidity and mortality effectively.
- Future studies are advised to focus more on aetiologies of anaemia and associated risk factors among OA children to assist policymakers in devising effective programmes specific to OA children.
- Future studies are also encouraged to perform in-depth analysis and reporting of data on anaemia obtained from OA children as the data is extremely valuable due to the limited availability.

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