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INTRODUCTION

- **Access to essential children medications in developing countries is still low¹⁻³**
- Lack of price control may also lead to **high medicine price in Malaysia^{2,3}**
- This study aimed to determine the availability and affordability of essential medicines for children in community pharmacies in Perlis, Malaysia.

METHODS

- A cross-sectional survey was conducted in **September to November 2019** on **all community pharmacies in Perlis**.
- Availability was expressed as the percentage of paediatric essential medicines available over the 37 included in the data collection form.
- Median price ratio (MPR) was calculated using two methods:
 - i. ratio of the median unit price to the Malaysian recommended retail price (RRP) 2019 as published in the Pharmaceutical Services Program website or
 - ii. international pricing reference (IPR) as published in the MSH International Medical Products Price Guide, 2015.
- MPR > 2 indicates medicines **sold at a high price**.
- Affordability was calculated by the **days' wages of lowest-paid unskilled government worker** required to purchase selected treatment courses.

RESULTS AND DISCUSSION

- Of 22 community pharmacies, **15 (68.2%) participated**.
- The mean **availability** of innovator brand (IB) (31.4%) and generic (GB) (55.9%) **paediatric essential medicines was low** (<70%) as shown in **Table 1**.
 - Similar finding to a local study by Babar et al., 2007²
- Essential over-the-counter medicines (List C in the Poison's Act) is widely available as compared to those in List A and B (prescription required).
 - No dispensing separation in private practices in Malaysia.

Table 1. Top 10 paediatric essential medicines most available in community pharmacies

	Availability (%)	
	IB	GB
Tab Ranitidine 150 mg	13.3	80
Tab Loratadine 10 mg	33.3	100
Calamine Lotion	0	93.3
Salbutamol 100 mg/dose inhaler	80	93.3
Tab Folic acid 5 mg	0	93.3
Tab Chlorpheniramine maleate 4 mg	0	86.7
Syr Chlorpheniramine maleate 2 mg/5 ml	0	93.3
Tab Paracetamol 500 mg	46.7	100
Syr Paracetamol 250 mg/5 ml	40	100
Tab Prednisolone 5 mg	0	80
Mean (SD)	31.4 (±24.86)	55.7 (±32.1)

- **Innovator brands was less available** compared to generic medicines.
 - Majority of physician from private sector tend to use innovator brands³.
 - Generics were sold at cheaper prices.
- **Psychotropic drugs showed low availability** such as Diazepam 5 mg and Phenobarbitone 30 mg due to stricter regulations².

Table 2. Paediatric essential medicines sold at higher prices.

Medication (Pack size)	Median Price Ratio (MPR)*			
	IB		GB	
	Based on IPR	Based on MPR	Based on IPR	Based on MPR
Tab. Albendazole 400 mg (10's)	1.2	2.2	0.9	1.6
Tab. Frusemide 40 mg (10's)	0	0	1.4	3
Tab. Metoclopramide 10 mg (10's)	0	0	1.8	3.5
Tab. Loratadine 10 mg (10's)	3.1	15.8	1.2	6
Betamethasone cream 0.1% (30 g)	1.1	2.4	0.6	1.2
Tab. Folic acid 5 mg (10's)	0	0	1.5	2
Chlorpheniramine maleate 4 mg (10's)	0	0	8.3	8.3
Syr. Prednisolone 3 mg/5 ml (60 ml)	0	0	0.9	3.6

- **Loratadine tablet had the highest MPR** per RRP of 15.8 for innovators; **chlorpheniramine tablet** had the highest MPR per IPR of 8.3 for generics.
- **30% essential medicines** (8 out of 27) for both innovator (18.5%) and generic brands (13%) showed MPR > 2 - **sold at higher prices** compared to RRP and IPR.
 - no pricing regulation in Malaysia
- MPRs per RRP were 0.8-15.8 and per IPR were 0.6-3.6 for innovators; MPRs per RRP:0.7-3.6 and per IPR:0.3-8.3 for generics (**Table 2**).
- **Syrup forms has lowest availability** compared to other dosage forms.

Table 3. Affordability expressed in the number of days wages of lowest paid unskilled government worker needed to purchase standard treatments.

Medical Condition	Median Price (RM)	Treatment	Treatment cost (RM)	No. of days of daily wages required*
Asthma	13	Salbutamol inhaler One inhaler per course of treatment	13	0.31
Nappy rash	7.35	Calamine lotion One bottle per course of treatment	7.35	0.17
Pain/inflammation	6	Ibuprofen 2 bottles of 60 ml (average 20kg child, for 3 days)	12	0.28

*Minimum wages estimated at RM 1100/month or RM 5.29/ hour (Federal Government Gazette, 2018)

- **Asthma treatment was the most expensive (Table 3)** at 0.31 day's wage, followed by pain (0.28) and nappy rash (0.17).
- **The three common diseases were considered affordable** by most people in Perlis (< 1 daily wage)
 - Most acute medicines for children were affordable according to a study done in a province in China⁴
 - Affordability of essential medicines in private retail pharmacies are high and different from place to place (1.2 to 5.9 weekly salary)¹

CONCLUSION

- **Innovator medicines** for paediatrics are **less available than generics** in community pharmacies in Perlis
- **Essential medicine costs higher than RRP and IPR**, although still affordable for the three medical paediatric conditions
- There is a **need to develop paediatric medicine price control guidelines** to reduce expenses for those with low and middle-income population.

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