

were exclusively breastfed, and the majority (86.4%) were vaccinated up to their age.

Around one-third of the children in the study had acquired pneumonia previously; 32.7% of these had experienced 3–5 episodes and 8.8% had experienced > 5 episodes (Table 2). About half of the mothers reported fast breathing/difficult breathing and fever as the first symptoms of illness followed by cough (41.1%) and refusal to feed (14.8%).

Knowledge and health-seeking behaviour of mothers

About half of the mothers (49.3%) had heard of pneumonia before the onset of their children's recent pneumonia (Table 3); in 60.8% of those who knew about pneumonia, this was because of their previous experience with their child. Pneumonia was perceived as a serious illness by nearly 70% of mothers. The most commonly recognized symptoms reported by the mothers were fast breathing/difficult breathing, fever and cough (46.7%, 21.1% and 20.0% respectively). Weather changes/cold weather, poor immunity and smoking were thought to be responsible for pneumonia by 24.1%, 17.0% and 10.8% of the mothers, respectively. Only 12.0% stated that infectious agents caused pneumonia. On the other hand, about 38% had no idea about causes.

On reviewing the mothers' health-seeking behaviour, 57.2% of the children were given home treatment before seeking medical advice. Antipyretics, cough-relieving drugs and herbs were the most frequently given medications (39.6%, 19.7% and 13.0% respectively) (Table 3). Antibiotics were given by only 4.9% of the mothers. With reference to timing of the first consultation, 26.8% of mothers waited for ≥ 2 days before seeking medical advice. Insufficient knowledge about the signs and symptoms of pneumonia/waiting until their child got better (89.0%) was the main stated reason for delay, followed by cost of health services/transportation (17.6%), unavailability of a nearby health facility (10.3%), inappropriate clinic appointments (7.3%) and previous negative experiences (6.6%).

Sociodemographic characteristics, mother's health-seeking behaviours and child's health status were compared with care-seeking timing for pneumonia. Factors that were significantly associated with delay in seeking medical care for suspected pneumonia were: living in a rural area ($P = 0.006$); low income ($P = 0.002$); treatment given at home before seeking medical advice ($P < 0.001$) and repeated episodes of pneumonia ($P = 0.002$) (Table 4).

Government hospitals/general health care units were the first source consulted by 62.7% of the mothers followed by private hospitals/clinics (35.1%) (Table 3). Only 2.2% sought help from inappropriate providers (pharmacists). In terms of mothers' compliance to the first consulted source, the majority of mothers reported high compliance practices, only 5.6% of were not compliant with the prescribed treatment (Table 5).

Table 3 Knowledge and health-seeking behaviour of mothers of pneumonic children under 5 years ($n = 507$), Alexandria 2017

Knowledge and health-seeking behaviour	No.	%
Previous knowledge about pneumonia		
Yes	250	49.3
No	257	50.7
If yes, what was their source of knowledge?^a ($n = 250$)		
Previous experience	152	60.8
Relatives/neighbourhoods	89	35.6
TV/media	11	4.4
Perceived seriousness of pneumonia		
I don't know	91	18.0
Not dangerous	70	13.8
Dangerous	346	68.2
Knowledge of pneumonia symptoms^a		
I don't know	197	38.8
Fast breathing/difficult breathing	237	46.7
Fever	107	21.1
Cough/common cold	101	20.0
Other (cyanosis, vomiting)	15	3.0
Knowledge of possible causes of pneumonia^a		
I don't know	195	38.5
Malnutrition	14	2.8
Air pollution	42	8.3
Smoking	55	10.8
Overcrowding	24	4.7
Poor immunity	86	17.0
Weather changes/cold weather	122	24.1
Infection	61	12.0
Other (ice cream, cold water, neglect, perfumes)	27	5.3
Treatment given at home before seeking medical help^a		
None	217	42.8
Antipyretic	201	39.6
Antibiotic	25	4.9
Herbs	66	13.0
Cough-relief drugs	100	19.7
Other (bronchodilator, antihistaminic)	37	7.3
Timing of first consultation		
First day of child illness	371	73.2
2–3 days after child illness	105	20.7
4–5 days after child illness	21	4.1
6 days or more after child illness	10	2.0
Causes of delay in seeking medical advice^a ($n = 136$)		
Insufficient knowledge of signs and symptoms of pneumonia/waiting until child got better	121	89.0
Cost of health services/transportation	24	17.6
Unavailability of a nearby health facility	14	10.3
Clinic appointments are not appropriate	10	7.3
Previous negative experience	9	6.6

Table 3 Knowledge and health-seeking behaviour of mothers of pneumonic children under 5 years (n = 507), Alexandria 2017 (continued)

Knowledge and health-seeking behaviour	No.	%
Social norms	2	1.5
Others	6	4.4
Source of first consultation		
Government hospital/general health care unit	318	62.7
Private hospital/private clinic	178	35.1
Pharmacy	11	2.2

*Multiple response variable.

First medical management of pneumonia from mothers' perspective

Diagnosis of pneumonia had not been made by more than half of the first consulted sources (52.7%). Around 60% of the first consulted sources did not request inves-

tigation (Table 5). Chest X-ray was the most common request (37.1%) followed by blood tests (17.5%).

In terms of treatment prescribed by the first consulted source, two-thirds of the children (63.7%) received home treatment: antipyretics, antibiotics and cough-relieving drugs were the most commonly prescribed treatments (78.0%, 70.0% and 53.9% respectively) (Table 5). About one-quarter of the children (23.5%) were admitted directly to the hospitals in our sample and received hospital treatment; for 11% of the sample, the first consulted source referred them to a specialized hospital without prescribing treatment. Only 1.8% did not receive any treatment at all. The majority of mothers reported high compliance practices: only 5.6% did not comply with the prescribed treatment.

Discussion

This study highlighted mothers' perceived barriers in seeking and receiving the proper management of their pneumonic children. We found that nearly one-third of

Table 4 Factors associated with mother's health care-seeking timing, Alexandria 2017

Independent variable	Seeking medical advice after first day of illness (n = 371)		Delay in seeking medical advice (n = 136)		P-value
	Mean (SD)		Mean (SD)		
Age of mother (years)	28.44 (5.97)		28.21 (5.48)		0.682
Age of child (months)	18.93 (17.32)		16.34 (15.24)		0.124
Child order	1.94 (0.73)		2.01 (0.71)		0.303
	No.	%	No.	%	
Sex of child					0.277
Male	240	71.6	95	28.4	
Female	131	76.2	41	23.8	
Place of residence					0.006
Urban	315	75.7	101	24.3	
Rural	56	61.5	35	38.5	
Income					0.002
Not enough & borrow	84	64.6	46	35.4	
Not enough	57	67.8	27	32.2	
Enough only	218	79.0	58	21.0	
Enough and saving	12	70.5	5	29.5	
Mother's education					0.358
Illiterate	112	75.2	37	24.8	
Primary	24	60.0	16	40.0	
Preparatory	75	72.1	29	27.9	
Secondary	129	75.4	42	24.6	
University	31	72.1	12	27.9	
Treatment given at home before seeking medical help					< 0.001
No	190	87.6	27	12.4	
Yes	181	62.4	109	37.6	
First time to have pneumonia?					0.002
No	102	64.2	57	35.8	
Yes	269	77.3	79	22.7	

SD = standard deviation.