ORIGINAL ARTICLE

# Perception on Pneumococcal Vaccination towards Infants among the Community in Selayang, Selangor: A Qualitative Study.

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## Abstract

**Background:** Pneumococcal disease is the leading cause of death in children under the age of five. Pneumococcal conjugate vaccines (PCVs) have been shown to be highly efficient in decreasing morbidity and mortality from Invasive Pneumococcal Disease (IPD). This study aims to explore the awareness and perceptions on acceptance, benefits and alternative solutions on pneumococcal vaccination towards infants among parents in Selayang.
**Methods:** A qualitative study was conducted among nine participants in Selayang who aged more than 20 years old. This study used purposive sampling and in-depth interviews of individual respondents using a semi structured interview guide. All interviews were audio-recorded, transcribed verbatim and checked. Thematic approach was used to analyze the data.
**Results:** The result showed that PCV awareness was fairly good and was generally accepted among most participants, as a protection mechanism for children, and because of recommendations from healthcare and service provided by the government. Meanwhile, three out of nine participants refused to take vaccines due to external barriers, personal belief and vaccine-related reasons. The finding of perceptive benefits towards PCV was summarized as prevention of pneumonia, enhanced immunity level, and control progression of the disease. Three alternative solutions to prevent pneumonia were identified: nutritious diet and supplements, complementary medicine and exercise, and natural approach to health and immunity.
**Conclusion:** Parents had multiple perceptions about PCV towards infants. It is crucial for healthcare professionals to recognise and address these concerns when consulting parents to increase awareness on PCV.

**Keywords:** *Pneumococcal disease, Pneumococcal Vaccine, Parents, Selayang.*

## Introduction

PCVs containing polysaccharide antigens connected to carrier proteins have been found to be effective in developing an immune response and in reducing nasopharyngeal carriage of vaccine-type pneumococci in infants and children. Streptococcus pneumoniae is a major cause of infectious disease worldwide.[1] Globally, over a million children and half a million adults die every year as a result of IPD, including meningitis, sepsis and bacteremic pneumonia.[2] Data from the World Health Organization shows that pneumococcal disease is found to be the main cause of mortality and morbidity among children under five years of age.[3] In Malaysia, pneumonia was the third leading cause of death in children under five, accounting for 3.8% of under-five deaths in 2016. [4]

It has been proven that PCVs are highly effective in preventing morbidity and mortality due to IPD, pneumonia and otitis media in children.[5] PCV10 and PCV13 are the two types of vaccines which are available in the Malaysian market to prevent IPD in children less than two years old. The PCV can be given to healthy children as early as two months of age with subsequent booster doses at four months, six months and 12 to 15 months of age.[6] In Malaysia, the overall under five-year-old death incident rate in 2006 was 0.6 per thousand age-specific population and 3.5 per thousand live births. Meanwhile, it was reported in 2010 that there were six deaths per 1000 live births. The crude birth rate in 2010 was 17.5.[7]

In December 2020, the Director-General of the Ministry of Health, Malaysia has announced that pneumococcal vaccines will be included in the National Immunization Programme and implemented to all infants in the health clinics.[8] Therefore, this study aims to explore and review the awareness and perceptions on acceptance, benefits, and alternative solutions to pneumococcal vaccination towards infants among parents in Selayang.

## Materials and methods

### Sampling, participants and setting

This study used a qualitative approach to explore the perception of parents towards Pneumococcal vaccination for their children. In-depth interviews (IDIs) were conducted in two methods: face-to-face interviews and online video-call interviews via Google Meet, depending on participants' request. The respondents did not receive any incentive to participate in the study.

Our study was conducted in a community area in Selayang, Selangor. This community area has been chosen because it consists of various races, religions, and employment statuses. Nine participants were recruited via purposive sampling, as referenced by a study in USA, in which a minimum sample size of nine is required to reach data saturation.[9] The participants were recruited by researchers, through friends and relatives. The inclusion criteria were that parents be more than 20 years of age, who understand Malay, and own or adopt at least one child. The exclusion criteria were non-Malaysian, those who were diagnosed with mental health problems, and the deaf and dumb. Interviews were conducted over a period of 16 weeks between July, 12th to October, 31st 2021.

A set of interview question guides were used in this study, which comprises two sections; sociodemographic data and perception. The open-ended questionnaire for perception was adopted and adapted from a study in Malaysia, to guide the interviews.[10] A pre-test on chosen individuals, who fit our inclusion and exclusion criteria, were conducted prior to study to assess comprehension and to determine the time needed to conduct the interviews. An interview lasted half an hour to one and a half hours.

### Analysis

All interviews were transcribed word-for-word and double-checked for accuracy. The

information gathered from the interviews was transcribed into English and analyzed manually by the researchers. Each researcher's results were paired by the similarity of meaning and reviewed by the entire research team to address bias and derived issues independently. Two researchers used a thematic analysis method of open, axial, and selective coding to develop an initial coding framework.[11] The rest of the researchers coded subsequent interviews. Regular meetings were held to review the expanding coding framework's structure and content, and any conflicts were fully addressed through discussion.

## Results

We interviewed nine participants at which point data saturation was reached (Table 1). There were seven Malay participants, one Chinese and one Indian. Most participants are around the age of 41-50 (55.6%), female (55.6%), practicing Islam (77.8%), and have tertiary education (88.9%). All participants are employed.

### Awareness on pneumococcal vaccine

Referring to Table 2, the majority of participants were aware of the Pneumococcal vaccine for infants.

### Perceived Acceptance towards PCV

In this study, almost all the parents agreed to take the vaccine for their children. Three out of nine parents choose not to vaccinate their children with PCV, while one of them refused and accepted the vaccination at the same time depending on different circumstances. The reasons of the parents who accepted the vaccine have been divided into three themes (Table 3).

#### i. Protective mechanism for their children

Most of the participants who agreed to accept the PCV stated that the vaccine may protect and prevent their children from getting pneumonia.

*"Because I think it's a good and new initiative by the government to prevent pneumonia."* - *P1*

*"Yes, because the doctor said that it can prevent pneumonia. I also have children who have already taken this vaccine and from what I can see is this vaccine is not even harmful."* - *P4*

*"Yes, I accept because pneumonia is one of the deadliest diseases among infants. So, with pneumococcal vaccine my child is guaranteed safe."* -*P6*

#### ii. Recommendation from a healthcare worker

Without having good knowledge of either pneumonia or PCV, one of the participants agreed to take the vaccine because of a recommendation from the doctor.

*"I accept this vaccine, all my children take this vaccine when they are young because this is what my doctor recommended to me."* - *P7*

#### iii. Service provided by the government

Some of the participants are willing to take the vaccine for their children because it is given for free by the government. Some of them believe that what has been scheduled by the government is the best for their children.

*"I will accept PCV only if it is given for free. If it is not given for free by the government, I don't think the vaccine is important."* - *P3*

*"I believe the vaccine that has been provided by our government is good and has passed all the clinical evaluations." – P5*

Table 3 also shows the three main categories of reasons parents refuse PCV vaccination for their children.

#### i. External barriers

The most crucial concern among vaccine refusal was the cost of the vaccine that caused the main barrier for them from taking PCV.

*"We have to pay for an expensive price if we buy the vaccine ourselves." – P3*

**ii. Personal belief**

Parents expressed a range of health beliefs that played an important role in motivating them to refuse vaccination. Some of them expressed their lack of confidence in modern medicine as they believed modern medicines do not cure the disease but only treat the symptoms based on their previous experiences.

*"I am not confident in taking this vaccine. I usually meet the doctor at the clinic whenever I am sick and they will give me medicine just to treat the symptoms and not to cure the disease completely."* - *P9*

Other participants held the viewpoint that this was what was referred to as a "natural" approach to health and believed that immunity that was obtained by contracting the disease was better than the pneumococcal vaccination immunity.

*"I prefer the natural way and I believe our own immune system can do the work to prevent any disease."* - *P4*

There are also participants who believed that children have stronger immune systems to protect against the disease due to breastfeeding.

*"I believe the kids already have their own antibodies to fight the disease. They were breastfed for two years."* - *P3*

**iii. Vaccine-related reason**

Most participants refused vaccines for their children due to factors related to the vaccine itself. Participants believed vaccines were unnecessary as there was no evidence that could be found to prove the effectiveness of this vaccine in a long time.

*"Besides, there is no available approved data that shows the effectiveness of this vaccine in 10 to 30 years' time…"* - *P4*

A participant chose against getting the vaccine after hearing about its alleged harmful health effects;

*"I've heard a lot of news about the side effects of vaccines. So, I don't want to take any risks."* - *P4*

**3.3 Perceived Benefits towards PCV**

Almost all the parents interviewed perceived that PCV had benefits for their children (Table 4).

**i. Prevention of Pneumonia**

One of the participants described the benefit of PCV in this way:

*"I believe PCV can prevent my children from pneumonia."* - *P3, P5, P6*

**ii. Enhance immunity level**

There are also participants that perceived PCV can enhance the immunity level that could help the body to fight against the disease.

*"I feel like this vaccine can help and develop the immunity in the body…"* - *P2*
*"Yes, it helps to prevent pneumonia and helps to increase kid's immunity level."* - *P1*

**iii. Control the progression of the disease**

This participant also perceived that PCV could control the progression of the disease from getting worse.

*…and if the kid has been infected also the disease would not become worse."* - *P2*

**3.4 Alternative Solutions Other Than PCV**

Some participants believed that there are other alternative approaches to prevent their children from pneumonia. The solutions perceived by participants have been categorized into three themes (Table 5).

**i. Maintain a nutritious diet and supplements**

Participants underlined how providing a balanced diet and vitamins for their children is enough to

boost their children's immunity and protect them from pneumonia, as one participant said:

*"We can give vitamin C, multivitamins and keep a balanced food diet to strengthen our children's antibody so that we can prevent them from getting infection." – P3*

Another participant said:

*"I usually monitor my children's diet to protect them from diseases. I will make sure my child eats a balanced and nutritious diet such as eating a lot of vegetables and fruits as well as adequate protein and carbohydrates." - P6*

**ii. Consumption of complementary and alternative medicine**

Several parents believed that alternative medicines also help to prevent their children from pneumonia. One of the parents perceived that homeopathic medicine is a reliable method:

*"I will give my child vitamin c and also homeopathic medicine. However, if this vaccine already exists for the benefit of infant, I'm not going to do this method." - P7*

One of the participants also believed that protection from respiratory disease was obtained through the consumption of Ayurvedic medicine.

*"I gave my children vitamin C and practiced some Ayurvedic medicine such as fenugreek tea to maintain lung health. But I'm not sure whether it's beneficial like the PCV vaccine or not. Because I don't take them to replace the vaccine, that's just for extra benefits for them." – P2*

Another participant mentioned that their family practiced Chinese traditional exercise to enhance their immunity against various diseases:

*"It is enough to prevent pneumonia by practicing a healthy diet and exercising regularly. Eat oats and less oily food. Chinese people usually do Qigong exercises to improve our immune system." - P4*

**iii. Natural approach to health and immunity**

Some participants prefer to take a natural approach to their health, which includes eschewing 'unnatural' man-made treatments like vaccinations. Unnatural substances were thought to be superfluous because the human body was not designed to be reliant on them in order to function normally:

*"I believe I can protect my children just by breastfeeding them. You know breast milk can make them develop their own immunity naturally lah.. believe me. I don't want to put things in their body that are not natural." - P9*

## Discussion

Our study in the Selayang community showed most of the participants agree to accept the vaccine for their children, and the healthcare workers' recommendation is one of the determinants for parents to accept the PCV. Participants in a study in Indonesia also agreed that healthcare workers showed a good attitude in influencing parents to accept the vaccine as it is very beneficial for their children's health.[12]

We observed that some of the participants believed that the government-provided immunization programme is very helpful as it carries a lot of benefits. Thus it encourage them to perceive the vaccine. These findings contrasted with a study in Indonesia, where PCV is not included in their national immunization programmes. So, they have the right to either accept it or refuse it. [12] However, this study was finished in 2013, hence this article may have limitations in that it may contain information regarding the Indonesian National Immunization Program for children from a previous period.

Most of our participants believed PCV could bring benefits to their children, particularly in preventing pneumonia, enhancing immunity

levels, and controlling the progression of the disease. This is consistent with a study that also reported that most of the participants understood that vaccination was a method that could increase the body's immunity and help prevent the occurrence of diseases, especially for those with lower immunity.[13]

Nevertheless, there was also a minority of the participants who refused to take the vaccine for their children as they did not believe in the efficiency of the vaccine to prevent and cure the disease. This finding is consistent with another study in which the participants also expressed their opinion that modern medicine or the vaccine did not cure the diseases.[14]

Another determinant that leads the parents to refuse the PCV is vaccine-related problems. They believed that there is no proven data showing the vaccine's effectiveness. In addition, some uneventful experiences with childhood vaccination might also lead to the decision-making of parents to either take or refuse the vaccine.[15]

Cost is also the main barrier for parents to accept the vaccination. Most of it was reported more often in private clinics compared to public health clinics.[12] However, since December 2020, the Malaysian government has implemented free PCV vaccination in all at no cost at all public health clinics.

The alternative approaches using complementary medicine such as Traditional Chinese Medicine (TCM), practiced by the parents are undeniably effective to prevent respiratory infections. However, these practices should be applied in combination with other preventive approaches to increase their effectiveness. TCM in combination with western pharmaceuticals is recommended as a supportive treatment for severe acute respiratory syndrome (SARS), with 58.3% of verified SARS patients showing a beneficial impact.[16] In addition, breastfeeding is well-known to decrease the incidence of pneumonia in young children by up to 32%, which has been agreed upon by our participants.[17]

This study does have certain drawbacks. The study's participants all had a secondary or tertiary education background, and it is possible that this study overlooked the reasons why parents with less educational backgrounds decline vaccination. Participants from rural areas should also be included to get more data for future studies.

## Conclusion

This study found that most parents are aware of vaccinations against pneumococcal infection, but more effort is needed to raise awareness, especially to overcome the refusal factors. In addition, this study provides an insight on reasons for parental refusal and acceptance of pneumococcal vaccines, as well as personal practises for preventing childhood pneumonia. It is crucial to recognise and address these concerns when advising parents who refuse immunization. We would recommend further studies in the future to investigate the prevalence of pro-vaccination and anti-vaccination practices and the factors that influence these practices among the general public.

## Ethical clearance

Ethics approval was obtained from UoC Research Ethics Review Committee (CRERC), Malaysia (Ref. No. UOC/CRERC/AL-ER (29/2021)). All participants gave written consent to participate in this study and all interviews were conducted anonymously.

Table 1. Participants' demographic information

| Participant no. | Age (years) | Gender | Religion | Race | Occupation | Education level | Household income |
|---|---|---|---|---|---|---|---|
| P1 | 53 | Male | Islam | Malay | Bank manager | Tertiary Education | T20 |
| P2 | 34 | Female | Hindu | India | Private teacher | Tertiary Education | T20 |
| P3 | 28 | Female | Islam | Malay | Account executive | Tertiary Education | M40 |
| P4 | 49 | Female | Buddha | Chinese | Finance executive | Tertiary Education | B40 |
| P5 | 49 | Male | Islam | Malay | Optometrist | Tertiary Education | M40 |
| P6 | 44 | Female | Islam | Malay | Self-employed | Secondary Education | M40 |
| P7 | 42 | Male | Islam | Malay | Executive manager | Tertiary Education | M40 |
| P8 | 45 | Female | Islam | Malay | Engineer | Tertiary Education | M40 |
| P9 | 29 | Female | Islam | Malay | Nurse | Tertiary Education | B40 |

Table 2. Awareness on PCV

| **Awareness on PCV** | **Frequency (n)** | **Percentage (%)** |
|---|---|---|
| Yes | 5 | 55.6 |
| No | 4 | 44.4 |
| Total | 9 | 100.0 |

Table 3. Reasons for acceptance and refusal of PCV

| Perceptive acceptance of PCV towards infants | | |
|---|---|---|
| | **Theme** | **Code** |
| **Reasons for vaccination acceptance** | As a protection mechanism for children | Prevent pneumonia |
| | | Guarantee child's safety from pneumonia |
| | Recommendation from healthcare | Doctors' recommendation |
| | Service provided by government | PCV is given for free |
| | | PCV is scheduled by Ministry of Health |
| **Reasons for vaccination refusal** | External barrier | Expensive |
| | Personal belief | Believe in children's natural immunity |
| | | Lack of confidence in modern medicine |
| | Vaccine related reason | Lack of evidence regarding long term effectivity of vaccine |
| | | Fear of the side effects |

Table 4. Perception towards benefits of PCV for infants

| Perceptive benefits towards PCV | |
|---|---|
| **Theme** | **Code** |
| Prevention of pneumonia | Prevent child from pneumonia |
| Enhance the immunity level | Develop the immunity in the body |
| | Increase child's immunity level |
| Control progression of the disease | The effect not worsen if the child is infected by pneumonia |

Table 5. Alternative solutions other than PCV to prevent pneumonia

| Alternative solutions to prevent pneumonia | |
|---|---|
| **Theme** | **Code** |
| Nutritious diet and supplements | Less oily food and oats |
| | Balanced diet: vegetables, fruits, protein and carbohydrate |
| | Multivitamins supplement |
| Complementary medicine and exercise | Ayurvedic medicine: Fenugreek tea |
| | Homeopathic medicine |
| | Chinese traditional medicine: Qigong exercise |
| Natural approach to health and immunity | Breastfeeding |

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