Factors associated with the Indonesian workforce' Pneumonia Vaccination Intention: A Convergent Parallel Study

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ABSTRACT: Pneumonia is part of Acute Respiratory Infections (ARI) that has high disease burden not only in the infants but also among Indonesian adult workforce. Following data from Indonesia medical trend by marsh mercer in 2023, Acute Respiratory Infections (ARI) and Pneumonia showed significant burden in the workplace and recognized as one of highest cases, medical claim, productivity loss and hospitalization. Despite the availability of the vaccine to prevent Pneumonia, the vaccination utilization remains very low in Indonesia workforce and adult in general (Utomo, 2023). This study is aiming to understand better what are the factors that associated with the workforce' Pneumonia vaccination intention especially after COVID-19 pandemic. This study adopts (Ajzen, 1991) Theory of Planned Behavior (TPB) in explaining the variables (Attitude, Subjective Norm, Perceived Behavior Control and knowledge) that influencing the vaccination intention among Indonesian workforce. This study applies a convergent parallel study with quantitative data analysis and qualitative data analysis are performed parallelly, followed with data integration as summary. The quantitative data is collected through online survey with non-probability sampling & purposive method. Total 151 adult respondents provided their response. The qualitative data is collected through semi-structured interview with total 5 respondents of key identified stakeholders. This study utilized Partial Least Square Structural Equation Modelling (PLS SEM) as data analysis method for quantitative and Thematic Analysis for qualitative method. The results show that attitude, perceived behavior control and knowledge of Acute Respiratory Infections are positively influenced the Pneumonia vaccination intention while subjective norm is not. This study also found the underlying cause of low preventive measurement like vaccination are due to several reasons like the belief of curative is the basic medical needs in the workplace, providing vaccination coverage is part of talent retain/attract strategy, additional cost burden in providing vaccination coverage. Lower awareness on vaccination benefit in general, diseases burden & Prevention of Pneumonia & ARI are the key blockers of the lower vaccination acceptance as preventive measurement in the workplace setting in Indonesia. Lastly, Influenza Vaccination and mask wearing is the most common preventive measurement that embraced by the employer and the employee. This study contributes the application of Extended Theory Planned Behaviour towards vaccination intention among Indonesia workforce for Pneumonia Vaccine and provide extensive insights and recommendation to the multi stakeholders on the strategy to put prevention through vaccination to tackle the high burden of Acute Respiratory Infection Especially Pneumonia among Indonesia workforce.

KEYWORDS: Acute Respiratory Infection (ARI), Pneumonia Vaccine, Preventive Measurement, Theory of Planned Behavior, Workplace Vaccination.

INTRODUCTION

Acute Respiratory Infection (ARI) is a disease that infecting respiratory system including its organ/tract. ARI might cause by hundreds different types of micro-organism like bacteria, virus and fungi. ARI is easily transmissible and contagious especially in the high-risk population like infants, toddler and elderly (Simoes et al., 2006). ARI has high burden and become top 10 most common diseases in Indonesia health facilities (*Rencana Aksi Program (RAP) Ditjen P2P 2020-2024 (Revisi) – Ditjen P2P*, n.d.). Acute respiratory infections (ARIs) are usually divided into two-part, upper respiratory tract infections (URIs) and lower respiratory tract infections (LRIs). The most prevalent cases of Acute Upper Respiratory Infections (URIs) are rhinitis (commonly known as cold), sinusitis, ear infections, acute pharyngitis or tonsillopharyngitis, epiglottitis, and laryngitis. Most of URIs cases have a viral ethology. While infections of the lower respiratory tract (LRIs) include bronchitis, bronchiolitis and pneumonia (Simoes et al., 2006). Based on Indonesia MOH data in 2018, Acute Respiratory Infections (ARI) prevalence in Indonesia was 9,3% and pneumonia were ranked 9th as the top mortality cause with more than 19,000 deaths in 2019 (KEMENKES, 2018).

Besides the individual burden, ARI included Pneumonia cases in the workplace may have consequences for employers, high sickness absenteeism, lower productivity, and increased of medical claim. There is evidence found that employees with ARI lead to lower productivity, and even if employees return from the absenteeism, the productivity is still temporarily lower than before their respiratory infection. Sickness absenteeism and reduced work performance due to ARI clearly lead to increased costs for the employer. Not only that, respiratory infections might lead to higher pressure on the healthcare system as well. For example, during seasonal influenza outbreak, there is increased of utilization of medical resources (Healthcare personnel, medicine, etc.) (Middeldorp et al., 2020).

While there is limited data on how acute respiratory infections (ARI) impacted to productivity in Indonesia but based on the latest data from insurance brokerage comparing 1st half of 2023 vs last year, the incidence of upper respiratory infections (URI) that lead to hospitalization was tripled (up 193% in adult workforce), the incidence of pneumonia was up 56,9% in the adult workforce. Furthermore, the medical cost due to this increase incidences shows similar trend, up 62,3% for pneumonia and almost doubled the average cost for upper respiratory infections (URI). The hospitalization cost associated with the URIs and Pneumonia also shows significant burden to the company ranging from Indonesia Rupiah (IDR) 9 million (for URIs) to IDR 37 million IDR (for Pneumonia). After declining medical treatment cost and usage during COVID in 2020, the medical claim growth keeps increasing until the peak of 14.6% growth in 2023 vs 12.3% growth in 2022. The overall claim ratio hits above 95%, and it's common to see > 120% claim ratio. Insurers are responding to the need for cost containment due to the surge of treatment cost and member behavior in the return of pre-covid era. While the premium price is expected to surge, companies need to consider cost containment measure as well as looking into preventive healthcare such as screening and vaccination (Utomo, 2023)

Based on 2023 market survey from Marsh Mercer, approximately 85% employer in Indonesia provide vaccination coverage in their outpatient benefit but only 30% of employer provides the vaccination coverage for all ages (children & adult) and the rest only provide it for children. In the utilization side, children vaccination mainly infants are the highest and subsequently the usage of vaccination benefit in the adult workforce is the lowest. There has been a significant rise in the number of Upper Respiratory Infection (URI) inpatient cases and cost from 2022 to 2023 and Marsh Mercer projected the trend will continue in 2024. The trend is not just reflecting frequency and average cost, but it led to longer length of hospitalization and utilization of Intensive Care Unit (ICU). URI is a general diagnose which require further test to ascertain the specific illness and this disease is number one top contributor of all outpatient cases. Aligned with URI claims, pneumonia cases and cost have a significant rise post pandemic. Marsh Mercer project the case rise will reach beyond 30% growth and more 50% growth in cost incurred in 2024 (Utomo, 2023).

Despite of high diseases burden among the workforce, acute respiratory infections (ARI) including Pneumonia remains in curative focus rather than prevention focus by the most of employers in Indonesia. There is only one-third of the company in Indonesia have the prevention focus (through vaccination). Furthermore, for the employer with the adult vaccination coverage, the vaccination utilization among the employee is very low (Utomo, 2023). That`s why there is urgent need to understand the factors that associated with the Indonesian workforce' Pneumonia vaccination intention and uncovering the reasons why majority of the employer in Indonesia doesn't have priority towards prevention of the diseases through vaccination.

THEORETICAL FOUNDATION

There are several theories are commonly used to study and predict health related behavior change (attitude, intention, knowledge and behavior). Those theories are Health Belief Model (HBM), the Theory of Planned Behavior (TPB), the Theory of Reasoned Action (TRA), and Trans-Theoretical Model (TTM) (Armitage & Conner, 2000). Armitage and Conner found that HBM as weaker predictive power due to poor construct definition, lacking in combinatorial rules and weak in validity predictive of the HBM's core psychological components (Armitage & Conner, 2000). In other hand, there are solid research showing that both TRA and TPB predictive power is superior than HBM and with model contained in the TPB prove it has predictive power in greater percentage than TRA (Carter et al., 2006). During the COVID19 pandemic, TPB has been extensively employed to understand COVID19 preventive behavior in term of getting vaccination intention (Limbu et al., 2022). In this study, there are more than forty-three studies that meet the inclusion and suggests a finding that TPB is proven useful model in predicting intention to receive a COVID19 vaccine. Author also suggests an education program to increase awareness in promoting COVID19 vaccination and TPB might be used to achieve the goal (Limbu et al., 2022). Not only proven in explaining key variables in influencing the intention of getting COVID19 vaccination, TPB validity in

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predicting vaccination intentions in other vaccine are supported with extensive research, including human papilloma virus (HPV) (Zomordi et al., 2022), and Influenza (Bellali et al., 2023; Kim et al., 2023). However, for acute respiratory infections like pneumonia, there is few research that highlight TPB utilization in predicting vaccination intentions but most of them focusing on parents' vaccination intentions for their infants/children (Limbu et al., 2022). Ajzen also suggested that TPB was open to additional predictor beyond attitude, subjective norm and perceived behavior control especially the identified predictors accounted for significant variance over and above three foundational variables of TPB (Ajzen, 1991). There are increasing number of research have shown that additional variables might increase the predictive power of TPB (Conner & Armitage, 1998). This study will apply Extended Theory of Planned Behavior (TPB) in exploring the variables that influence the vaccination intention among Indonesian workforce.

Research Questions
There are three identified research questions that will become the main focus of this study:
• (RQ1) What are the influencing factors that determine the intention of the Indonesian employees in accepting Acute Respiratory Infection (ARI) vaccine (e.g: Pneumonia vaccine)?
• (RQ2) Why adult vaccination coverage as part of medical benefit is not prioritized? Is preventive approach is not resonating the same importance than the curative approach?
• (RQ3) What kind of preventive programs that Indonesian company have implemented to reduce acute respiratory infections (ARI) like Pneumonia in the work place?

Conceptual Framework
In this study, Theory of Planned Behavior (TPB) will actually explain & predict employee willingness to get the vaccination depends on four tested variables (attitude, subjective norms, perceived behavioral control and one additional element are knowledge on the burden and impacts on acute respiratory infections). Those four variables are forming extended Theory of Planned behavior (TPB) that researcher proposed in this study. From this conceptual framework with extended TPB approach, there are four proposed hypotheses that need to be analyzed to understand the influence towards employee intention towards Pneumonia vaccination.

Following the literature search and stakeholder analysis on the root causes during the problem exploration. It showed that knowledge on Acute Respiratory Infections (KARI) and Pneumonia are possibly correlated with the attitude towards intention to the vaccination. Knowledge on Acute Respiratory Infections (KARI) variable is the extended variable proposed by the researcher to study whether this additional variable may increase the predictive power of TPB in this research. Therefore, researcher proposed the first hypotheses below:

H1: Knowledge on Acute Respiratory Infections (KARI) example Pneumonia burden & Impact will be positively associated with attitude toward uptake of vaccine to prevent Pneumonia.

Following the original model of TPB from Ajzen, researcher proposed that Attitude (ATT) will be positively associated with the intentions of vaccination. Attitude towards Intention to get Pneumonia vaccination will be determined by focusing on three indicators: vaccination is vital towards pneumonia prevention (ATT1), the cost of the vaccine (ATT2), and disease burden of ARI and Pneumonia (ATT3). Therefore, researcher proposed the second hypotheses below:

H2: Attitude (ATT) toward Acute Respiratory Infection (Pneumonia) vaccination will be positively associated with the intentions toward Acute Respiratory Infections (Pneumonia) vaccination

Following the original model of TPB from Ajzen, researcher proposed that Subjective Norm (SN) will be positively associated with the intentions of vaccination. Subjective Norm towards intention to get Pneumonia vaccination will be determined by focusing on two indicators: coworkers/superior influence (SN1) and spouse influence to stay healthy (SN2). Therefore, researcher proposed the third hypotheses below:

H3: Subjective norm (SN) will be positively associated with the intentions toward Acute Respiratory Infections (Pneumonia) vaccination

Following the original model of TPB from Ajzen, researcher proposed that Perceived Behavioral Control (PBC) will be positively associated with the intention of vaccination. Perceived Behavioral Control (PBC) towards intention to get Pneumonia vaccination

will be determined by focusing on two indicators: Company provide the vaccine (PBC1) and Spouse support to get the vaccination (PBC2). Therefore, researcher proposed the fourth hypotheses below:

H4: Perceived behavioral control will be positively associated with the intentions toward Acute Respiratory infections (Pneumonia) vaccination uptake

RESEARCH METHODOLOGY

To uncover the influencing factors that drive ARI/Pneumonia vaccination intention, researcher is intending to use extended Theory of Planned Behavior (TPB) quantitative framework to identify the influencing variables and prove the hypotheses. While for reasons exploration why adult vaccination is not prioritized and type of preventive options that have been implemented in the workplace, this research questions will be explored with qualitative semi structured interview with the identified key stakeholders. Since the research questions are tapping different objectives, Author proposed A Convergent parallel study with quantitative data analysis and qualitative data analysis are performed parallelly, followed with data integration as summary. The quantitative data consist of 9 indicators for four tested variables and collected through online survey with non-probability sampling & purposive method. Total 151 respondents of 18-55 years old adult workforce provided their response and involved in this study. The qualitative data is collected through semi-structured interview with total 5 respondents of key identified stakeholders such as Chief Executive Officer (CEO), Human Capital Director from diverse industry along with insurance brokerage & health insurance executive. This study utilized descriptive and Partial Least Square Structural Equation Modelling (PLS SEM) as data analysis method for quantitative and Thematic Analysis for qualitative method.

RESULTS

Based on the researcher best knowledge to the present, this study is the first study to study extended TPB to assess workforce intention to get ARI (Pneumonia) vaccination and also to understand the reason of low adult vaccination coverage among workforce in Indonesia. This study used key components of TPB (Attitude (ATT), Subjective Norm (SN) and Perceived Behavior Control (PBC)) and additional variable, Knowledge of Acute Respiratory Infections (KARI) to explain the intention of workforce in Indonesia to Pneumonia Vaccination uptake.

Quantitative Analysis

Researcher successfully collected 151 respondents that fits with the specific population that this study is targeting (adult working population at the range of 18-55 years old). The sociodemographic of this study also has good level of diversity with 62% female and 38% male, following with age split dominated by millennials at 85% and subsequently Gen Z at 10% and Gen X at 5%. The marital status of the respondents has good level of diversity with the split between single status at 30%, followed by married without kid at 17%, married with 1 kid at 23%, and lastly married with more than 1 kid at 30% of the respondents. The degree background is dominated by Diploma & Bachelor at 79% and Master at 21%. Additional demographic data like insurance type was also asked with split between govt/BPJS around 17%, private insurance at 38% and others (include mix insurance) at 45% of the total respondents. Lastly, the job level split also has good diversity with 10% of respondents in the C-suite/Director level, 43% in managerial level, 25% in supervisory level, 15% in staff level and 7% in other level.

Each of variables above along with the indicators are calculated for its mean and standard deviation (SD). The key insights are all indicators have high mean value. It means majority of the respondents has positive attitude towards all indicators. The indicators also show an adequate standard deviation (SD) value with value less than 1 with exception indicators of subjective norm 2 (SN2) with SD > 1. Based on researcher analysis, this is due to wide range of this indicators from 1 to 10.

Table 1. Mean & Standard Deviations for the measured indicators

Name	Type	Mean	Scale min	Scale max	Standard Deviation (SD)
ATT1	MET	4,318	1	5	0,704
ATT2	MET	3,907	2	5	0,792
ATT3	MET	4,503	2	5	0,585
SN1	MET	3,735	1	5	0,947

SN2	MET	4,656	3	5	0,515
PBC1	MET	4,278	1	5	0,957
PBC2	MET	4,126	1	5	0,816
IN1	MET	3,377	2	4	0,524
IN2	MET	8,49	3	10	1,317
KARI	MET	4,391	3	5	0,609

Following the mean and SD analysis for the indicators, researcher later started the model measurement with two times of iteration. The reason of conducting two iterations is there are two indicators shown outer loading lower than 0.7 point. Those two indicators are Attitude 2 (ATT2) and Subjective Norm 1 (SN1) with respectively the outer loading value at 0,187 and 0,507. To ensure reliability of the model, researcher decided to eliminate these two indicators (ATT2 and SN1) and restart the second iteration. Surprisingly, after eliminating ATT2 and SN1, the outer loading for the remaining indicators is above 0,7 with Variance Inflation Factor (VIF) <5. This shown that this model has good level of indicators reliability and multicollinearity. This is further supported with Composite Reliability (CR) value of all variables at the range of 0,8-1 and Average Variance Extracted (AVE) at the range of 0,6-1 for all variables. These values have shown that all variables are showing good level of reliability and validity.

Table 2. Model Iteration Comparison Between Proposed Variable

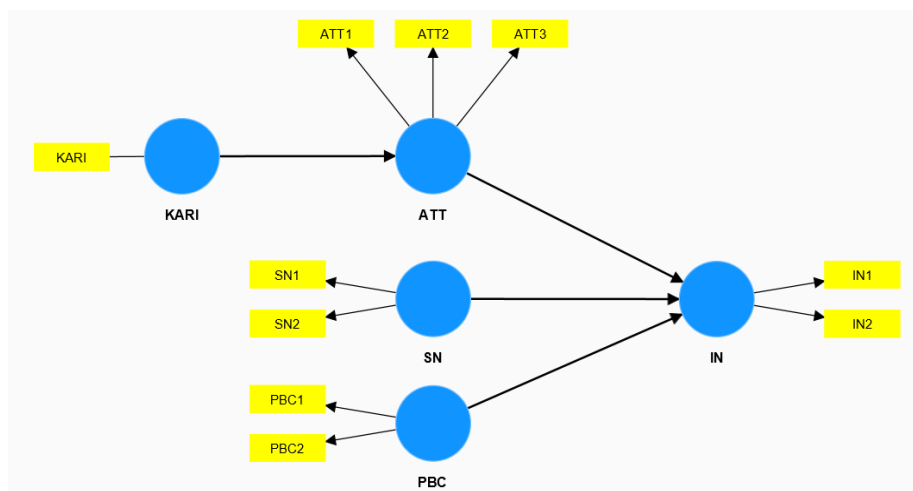| Indicators	Iteration 1		Iteration 2		CR	AVE
	Loading	VIF	Loading	VIF		
ATT1	0,886	1,167	0,884	1,141	0,802	0,671
ATT2	0,187	1,023	Removed			
ATT3	0,736	1,146	0,747	1,141		
PBC1	0,741	1,168	0,741	1,168	0,809	0,682
PBC2	0,902	1,168	0,903	1,168		
SN1	0,507	1,007	Removed		1	1
SN2	0,902	1,007	1	1		
IN1	0,892	1,578	0,891	1,578	0,89	0,803
IN2	0,9	1,578	0,901	1,578		
KARI	1	1	1	1	1	1

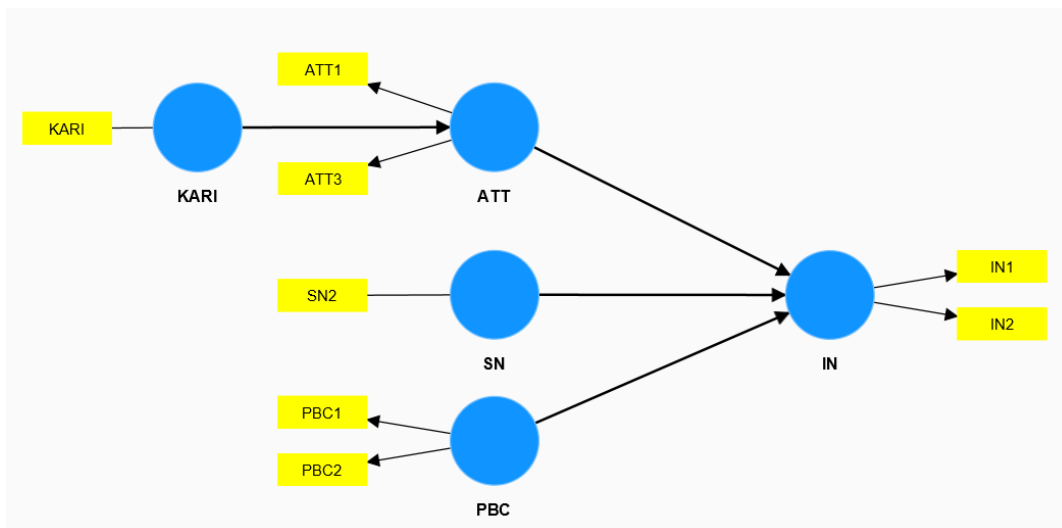**Figure 1. First Iteration of the Extended TPB Model (Before)**

Figure 2. Second Iteration of the Extended TPB Model (After)

Furthermore, PLS-SEM calculation also shown Heterotrait-Monotrait Ratio (HTMT) at below 1 which mean all variables are discriminant valid.

Table 3. HTMT value in the variables

HTMT Value	ATT	IN	KARI	PBC	SN
ATT					
IN	0,801				
KARI	0,778	0,697			
PBC	0,44	0,536	0,343		
SN	0,164	0,157	0,088	0,561	

Lastly, the R-Square calculation for this model shown that R-Square adjusted value of IN was 0.307, this means the model can only explain 30.7% of Intention (IN). This value was relatively low in social science research. This means that there might be other possible variables that can explain Intention (IN), in this research. As for ATT, the model also only explains 32.6% of it. This was because only KARI that was affecting ATT in this model.

Table 4. R-Square Value

R-Square	R-square	R-square adjusted
ATT	0,33	0,326
IN	0,321	0,307

Finally, the analysis moved to bootstrapping algorithm with generation of 10.000 samples and employing two-tailed test type. This bootstrapping method also will use significancy level at 95% (0.05) to test the significance relationship between variable.

• ATT → IN: This path from Attitude (ATT) to Intention (IN) has a positive coefficient of 0.452, a t-statistic of 6.942, and a p-value of 0, which is statistically significant. The null hypothesis is rejected, and this path is accepted. This means every 1 unit increase of Attitude (ATT) will lead to the increase of 0.452 unit of Intention (IN)

• PBC → IN: The path from Perceived Behavioral Control (PBC) to Intention (IN) has a positive coefficient of 0.256, a t-statistic of 2.703, and a p-value of 0.007, which is statistically significant. The null hypothesis is rejected, and this path is accepted. This means every 1 unit increase of Perceived Behavior Control (PBC) will lead to the increase of 0.256 unit of Intention (IN).

• SN → IN: The path from Subjective Norm (SN) to Intention (IN) has a negative coefficient of -0.017, a t-statistic of 0.214, and a p-value of 0.831, which is not statistically significant. The null hypothesis cannot be rejected, and this path is rejected. One of the possible reasons why this hypothesis is rejected is due to subjective norm (SN) construct is generally found to be a weak predictor of intentions. This is partly attributable to a combination of poor measurement and the need for expansion of the normative component (Armitage & Conner, 2001)

• KARI → ATT: The path from Knowledge of Acute Respiratory Infection (KARI) to Attitude (ATT) has a positive coefficient of 0.575, a t-statistic of 8.479, and a p-value of 0, which is statistically significant. The null hypothesis is rejected, and this path is accepted. This means every 1 unit increase of Knowledge of Acute Respiratory Infections (KARI) will lead to the increase of 0.575 unit of Intention (IN).

Table 5. Bootstrapping Result of Variables Relationship

Bootstrapping Result	Path Coefficient (b)	T statistics (t)	P values (p)	Conclusion
ATT -> IN	0,452	6,942	0	Accepted
PBC -> IN	0,256	2,703	0,007	Accepted
SN -> IN	-0,017	0,214	0,831	Rejected
KARI -> ATT	0,575	8,479	0	Accepted
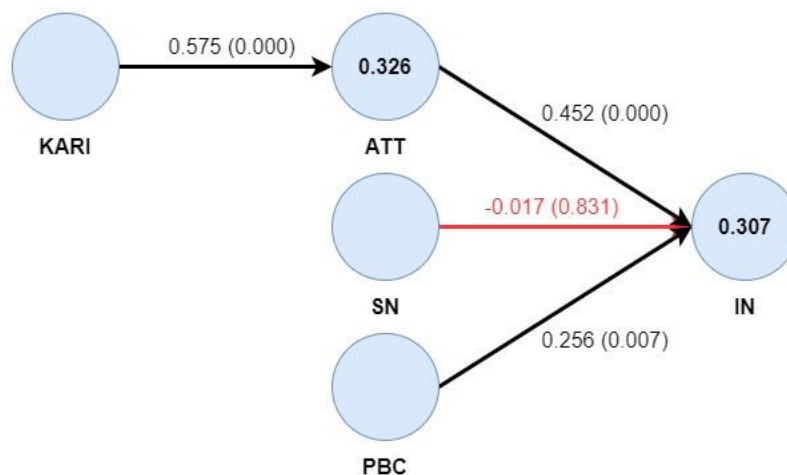
Figure 3. Bootstrapping Result of the Extended TPB Model

Qualitative Analysis

Researcher performed semi-structured interview with 5 target respondents during the assigned time and the interview is recorded and transcribed for further thematic analysis. These 5 respondents are marked with respondents ID 1 to 5. The identified theme & sub-theme in this qualitative analysis are:

• Belief

In this theme, there are three sub-themes are identified and those are:

1. Curative is basic medical need in the workplace

This sub-theme is based on three quotations that generated from 3 respondents (60% of the respondents). The reasons why preventive measurement like vaccination is not widely accepted it is because there is strong belief that curative is still the basic

medical need in the workplace but there is exception to some industry like insurance, the stakeholder has the strong belief of preventive so the acceptance to vaccination is much higher than others.

2. Vaccination Coverage is part of Health Benefit for talent recruitment / retaining strategy

This sub-theme is based on two quotations that generated from 2 respondents (40% of the respondents). For companies that provided the adult vaccination coverage, the purpose is not really for preventive measurement but more on providing better health benefit to the talent as part of recruitment & retaining strategy to the employee.

3. Face Mask is most common preventive recommendation in the manufacturer site

This sub-theme is based on two quotation that generated from 2 respondents (40% of the respondents). Face mask is the most common preventive recommendation in the manufacturer site but not in the office-based environment because there is clear Health & Safety policy that should be followed by the management.

- Catalysator

In this theme, there are one sub-themes are identified and those are:

1. Low Govt endorsement in workforce vaccination

This sub-theme is based on two quotation that generated from 2 respondents (40% of the respondents). One of the key reasons of low vaccination uptake in the workplace is because there is low government endorsement on workforce vaccination. In other hand, for pediatric vaccination, there is strong endorsement not only from medical association like Indonesian Doctor Association (IDI), Indonesian Pediatric Society (IDAI) but government through ministry of health (MOH) actively support the pediatric vaccination effort through National Immunization Program (NIP).

• Cost

In this theme, there are one sub-themes are identified and those are:

1. Adding Vaccination Benefit will imply to higher cost

This sub-theme is based on two quotation that generated from 2 respondents (40% of the respondents). One of the key reasons companies does not provide adult vaccination coverage to the employee is because it will lead to the higher cost (insurance premium payment) to the company.

• Knowledge

Lastly in this theme, there are three sub-themes are identified and those are:

1. Low understanding on vaccination safety & overall benefit (knowledge)

This sub-theme is based on six quotation that generated from 4 respondents (80% of the respondents). In summary, respondents highlighted there are low awareness and understanding on the vaccination benefit in preventing diseases and also myth and hoaxes in between lead to the low adult vaccination uptake. There is also limited information how preventive measure like vaccination can provide benefit to the companies and the workforce in it.

2. Influenza Vaccination is one of common prevention initiative in the workplace due to higher awareness

This sub-theme is based on three quotation that generated from 3 respondents (60% of the respondents). In Summary, Influenza vaccination is considered as one of the most common vaccines that used in the workplace, it is because influenza vaccine has higher awareness versus other adult vaccine.

3. Low Awareness of Pneumonia and its disease burden

This sub-theme is based on four quotation that generated from 3 respondents (60% of the respondents). In Summary, the reason why Pneumonia vaccination uptake is low in the workplace, it is because low awareness of the diseases burden and also the benefit of Pneumonia vaccination to the workforce and the companies.

Data Integration / Triangulation

In this research, the integration of quantitative and qualitative data in the interpretation level will be through joint display. Following the recommendation from Younas & Durante 2022, the joint display can be in the format of table of comparing finding in quantitative with qualitative and then researcher might put the interpretation in the mixed meta-inference (Younas & Durante, 2022).

Table 6. Joint Display of Quantitative Variables with Qualitative Theme along with the Mixed Meta-Inference

Quantitative Variables	Qualitative Themes	Mixed Meta-Inference
Knowledge of Acute Respiratory Infections (KARI)	Knowledge	**Confirmed**. Knowledge of acute respiratory infections (KARI) as extended variables proven to be positively associated with attitude toward uptake of vaccine to prevent Pneumonia. While in the qualitative analysis, Knowledge is one of the key themes identified and it led to three sub-theme that related to the reasons why there is low vaccination uptake towards Pneumonia vaccination and adult vaccination as general. These three sub-themes are: 1. Low understanding on vaccination safety & overall benefit (knowledge) 2. Influenza Vaccination is one of common prevention initiative in the workplace due to higher awareness 3. Low Awareness of Pneumonia and its disease burden This mixed meta-inference clearly show that knowledge of the disease burden and vaccination benefit play critical role in driving vaccination uptake towards Pneumonia Vaccination.
Attitude (ATT)	Cost	**Discordant.** Attitude (ATT) as key variables in the Theory of Planned (TPB) behavior proven to be positively associated with intention toward uptake of vaccination to prevent Pneumonia but one of the indicators (ATT2) that reflecting to the cost of vaccine cannot be measured due to lower reliability (outer loading <0.7) while in the qualitative analysis, Cost is identified as one of key theme with the sub-theme that vaccination will increase the cost to the employer. This means cost is the factor that lowered the vaccination uptake. With the cost related attitude cannot be associated between quantitative and qualitative data, it led to discordant mixed meta-inference.
Subjective Norm (SN)	Catalysator	**Expansion.** Subjective Norm as key variables in the Theory Planned Behaviour (TPB) proven to be negatively associated with intention toward uptake of vaccination to prevent Pneumonia. The identified indicator was spouse / family influence to stay healthy indeed found no influence towards the vaccination intention. In the qualitative analysis, catalysator identified as the theme and the sub-theme is the govt endorsement in workforce vaccination might increase the vaccination uptake. This finding is considered as expansion from the result from quantitative analysis. The uptake of vaccination might not increase with the influence by family/spouse but it might increase by govt endorsement.
Perceived Behavior Control (PBC)	Belief	**Confirmed.** Perceived Behavior Control (PBC) as key variables in the Theory Planned Behavior (TPB) proven to be positively associated with intention toward uptake of Pneumonia vaccination. The identified indicators like Company provide the vaccine (PBC1) and spouse support to get the vaccination (PBC2) found has the influence factor toward vaccination intention. While in the qualitative analysis, belief as theme and one of the sub-themes, vaccination coverage is part of health benefit for talent recruitment / retaining strategy is well aligned with the indicators of PBC2. The correlation is if the company provide the adult vaccination coverage with the intention to retain / attract the talent, it will lead to higher possibility of intention to get the vaccination.

CONCLUSION & RECOMMENDATION

Author will conclude the finding of this research and aligning it with the research questions and providing recommendation for the stakeholders and also for the future research.

• First Research Question: The influencing factors that determine the behavior & Intention of Employees in accepting Acute Respiratory Infections (ARI) / Pneumonia Vaccine

Following the result of the quantitative survey with the PLS SEM analysis, it showed that three of hypotheses out of four are accepted. Those hypotheses showed that variables like Attitude (ATT), Perceived Behavior Control (PBC), and Knowledge of Acute Respiratory Infection (KARI) are significantly influence in positive way towards the intention of getting the ARI/Pneumonia vaccination. While, the subjective norm (SN) variable is found not having significant influence toward the intention of getting the vaccination. Following the descriptive analysis, researcher also found the willingness level of the respondents in getting the Pneumonia Vaccination. The result showed that 81.4% of respondents indicated their willingness rate at 8 and above (out of 10 scale), followed by 15.2% of respondents indicated their willingness rate at 6 to 7 and 2.6% of respondents are neutral and only 0.7% or respondent has willingness rate at 3 (out of 10 scale). This result shown that the willingness of the employee to get the ARI/Pneumonia vaccination is quite high (>80% of respondents) and the variables that influencing the behavior / intention to get the vaccination will be Knowledge of Acute Respiratory Infections (KARI), Attitude (ATT) and Perceived Behavior Control (PBC).

• Second Research Question: The underlying reasons of low preventive measure like vaccination among corporations/employer in Indonesia

From the qualitative semi-structured interview and thematic analysis showed that there are three key themes that influenced this phenomenon. Those three key themes are belief, cost and knowledge. Each respective themes are supported with several sub-themes with details below:

• Belief

In this theme, there are two sub-themes are identified and those are:

1. Curative is basic medical need in the workplace

The reasons why preventive measurement like vaccination is not widely accepted it is because there is strong belief that curative is still the basic medical need in the workplace but there is exception to some industry like insurance, the stakeholder has the strong belief of preventive so the acceptance to vaccination is much higher than others.

2. Vaccination Coverage is part of Health Benefit for talent recruitment / retaining strategy

For companies that provided the adult vaccination coverage, the purpose is not really for preventive measurement but more on providing better health benefit to the talent as part of recruitment & retaining strategy to the employee.

• Cost

In this theme, there are one sub-themes are identified and those are:

1. Adding Vaccination Benefit will imply to higher cost

One of the key reasons companies does not provide adult vaccination coverage to the employee is because it will lead to the higher cost (insurance premium payment) to the company.

• Knowledge

Lastly in this theme, there are three sub-themes are identified and those are:

1. Low understanding on vaccination safety & overall benefit (knowledge)

Respondents highlighted there are low awareness and understanding on the vaccination benefit in preventing diseases and also myth and hoaxes in between lead to the low adult vaccination uptake. There is also limited information how preventive measure like vaccination can provide benefit to the companies and the workforce in it.

2. Influenza Vaccination is one of common prevention initiative in the workplace due to higher awareness

In Summary, Influenza vaccination is considered as one of the most common vaccines that used in the workplace, it is because influenza vaccine has higher awareness versus other adult vaccine.

3. Low Awareness of Pneumonia and its disease burden

The reason why Pneumonia vaccination uptake is low in the workplace, it is because low awareness of the diseases burden and also the benefit of Pneumonia vaccination to the workforce and the companies.

• Third research question: Type of preventive programs that company have implemented to reduce acute respiratory infections (ARI) / Pneumonia

Following the finding from the semi-structured interview, face mask is the most common preventive recommendation especially among the employee in the manufacturer site. The recommendation is based on health & safety policy that implemented in the manufacturer site. Another preventive programs that commonly implemented is influenza vaccination. Higher utilization of influenza vaccination is due to higher awareness of influenza disease burden and the benefit of vaccination in preventing influenza.

Several literatures also highlighted there are several strategies on how to increase uptake of workforce vaccination. One of the key strategies is offering vaccination in the workplace will increase the coverage of vaccination (Gualano et al., 2022). Workplace vaccination is effective not only for influenza vaccination but also for other herpes zoster, pneumonia, tetanus-diphtheria-pertussis vaccines (Ofstead et al., 2013). The same author also propose strategy in conducting employer-sponsored vaccination events at workplace will significantly increase the vaccination uptake and there was a strong association between employee and family vaccination status. Further finding by same authors also found that main reasons in receiving the vaccine were economic related (because it is free, it is convenient and avoiding absenteeism in the workplace) rather than health related and knowledge was associated with vaccination but customized education did not change beliefs (Ofstead et al., 2013). Surprisingly, adding incentive for vaccination, intensive advertising campaign and offering choices of vaccines also improved vaccination uptake in the workplace as well (Nowalk et al., 2010). Role of the health care professional like occupational physicians are also critical in succeeding the workplace vaccination campaign (Gualano et al., 2022). It is concluded that there is an interplay between control beliefs (knowledge) and behavioural beliefs (risk perception and confidence in vaccines) in shaping attitudes toward a vaccine. Confidence in vaccines plays the most important role, followed consecutively by risk perception and knowledge (Husna et al., 2022). It suggests that health authorities emphasize the safety and efficacy of vaccines in reducing the risk of disease while educating the public with authorized information (Husna et al., 2022).

Following the conclusion of this research explained above, researcher is proposing several recommendations to the different stakeholders below:

1. Vaccine Manufacturer

Actively build the awareness of Acute Respiratory Infections / Pneumonia disease burden along with the benefit of vaccination with multiple external stakeholders like government bodies (Kemkes & Kemnaker), medical association (IDAI, PAPDI, PDPI and PERDOKI), Insurance Brokerage, Health Insurance and corporates through B2B / Strategic Partnership.

2. External Stakeholder (Employer)

Establishing the pathway of adult vaccination inclusion into the out-patient benefit / corporate wellness program, mask wearing policy, and corporate vaccination program to encourage the preventive measurement to tackle acute respiratory infection / Pneumonia disease burden.

3. Future Research

Exploring other extended variable beyond Knowledge on Acute Respiratory Infections (KARI) to improve the Intention of Indonesian workforce towards acute respiratory infections/Pneumonia vaccination. Defining different Subjective Norm (SN) indicators to validate further the influence power towards the vaccination intention (IN).

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