# Validation of Filipino Version of a Questionnaire on Work-related Asthma Among Healthcare Workers of the Philippine General Hospital: A Prospective Cross-Sectional Study

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## Abstract

**Objective:** This study aims to validate a Filipino version of the questionnaire by Delclos *et al* on occupational risk factors and asthma among the health care workers of the Philippine General Hospital.

**Methodology:** Forward and backward translation method for bilinguals was used in this study. The Filipino translation was administered to 110 health care workers selected by stratified random sampling. After 24 hours, the retranslated English version was given to the same respondents. Testing for internal consistency reliability was done by computing for Cronbach's alpha. Construct validity was subsequently determined using the Cramer's V Coefficient.

**Results:** The Filipino questionnaire showed good internal consistency reliability, as shown by the overall Cronbach's alpha of 0.9016, which is comparable to that of the original version by Delclos. Likewise, our Filipino questionnaire showed good construct validity, supported by the Cramer's V coefficients ranging from 0.2204 (strong relationship) to 0.7843 (very strong relationship).

**Conclusion:** Overall, the Filipino version of the questionnaire for work-related asthma tested among the health care workers of Philippine General Hospital showed good reliability and validity. This may now be used as screening tool for occupational asthma among health care workers who are at risk of developing the disease. In addition, this research tool may be utilized to establish the prevalence of occupational asthma in hospitals and later on, aid in the development of a better working environment for the whole health care team.

**Keywords:** questionnaire validation, work-related asthma, healthcare workers

## Introduction

Work-related asthma is the most common form of occupational lung disease and contributes significantly to the overall disease burden of asthma.[1] New-onset asthma occurring in the workplace is termed as occupational asthma, which could be immunological or irritant-induced ("non-immunological OA"). Occupational asthma can be broadly defined as reversible airflow obstruction that is either caused by or exacerbated by a workplace exposure. More narrowly defined, occupational asthma includes only those cases of asthma that result from an exposure encountered exclusively at work. In this definition, asthma must be newly diagnosed and temporally linked with a workplace exposure that has either, historically, or experimentally, been demonstrated to cause asthma in previously healthy workers.[2]

Newman-Taylor and Cartier defined occupational asthma as "variable airway narrowing causally related to exposure in the working environment to airborne dusts, gases, vapors, or fumes."[3,4] The definition of occupational asthma advocated by Wagner and Wegman is broader including "all asthma caused or exacerbated by

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workplace exposures-including asthma from sensitizers, irritant-induced asthma, and workplace exposure-induced asthma attacks."[5,6]

Work-place exposure can also cause work-aggravated asthma where symptoms are aggravated in workers with pre-existing or coincident asthma. [17-19]

The studies that have been conducted among health care workers allowing more detailed characterization of potential associations between asthma and various workplace exposures have been limited.[20-22] Studies that address these remaining issues are particularly important considering that health care workers constitute one of the fastest growing sectors of the workforce.[23]

Irritant-induced occupational asthma has been reported to occur from an accidental spill of glacial acetic acid in a hospital, and from mixing cleaning product. Exposures to chemical spills of processing/developing chemicals among radiographers have been implicated in work-related asthma symptoms. Lesser exposures to asthma triggers, such as nebulized pentamidine or cleaning products, can exacerbate asthma in certain health care settings. Finally, symptoms that mimic asthma occur, such as in irritable larynx syndrome, from mucous membrane irritation on exposure to scented products or with darkroom exposures in radiographers ("darkroom disease").[2,7]

Confirmation and estimation of risk, however, in population-based studies have been inconsistent. Recent data in the US found that work-related asthma among health care workers represented 16% of total reported cases.[24] In the Philippines, asthma comprised 12.2% of occupational diseases as reported in 2003 through the Bureau of Labor and Employment Statistics.[25] However, data on occurrence of work-related asthma among health care workers in the Philippines is wanting.

There is considerable evidence that OA remains largely underdiagnosed among healthcare providers.[18] Since understanding the asthma-related effects from exposures in health care settings and other workplaces has importance for effective prevention, making a reliable diagnosis of OA early after its onset could be the most straightforward way to reduce the long-term functional impairment resulting from the disease.[2,18,26,27]

Confirming a diagnosis of OA and implicating a specific exposure can be challenging. No single test clinches the diagnosis. In the end, a preponderance of evidence must be viewed as the clinical gold standard for the diagnosis of OA in most clinical practices. The diagnosis will generally be established from a detailed history, physical examination, supported by serial lung function studies.[3]

After the history and physical examination, repeated pulmonary function testing is the most important tool in diagnosing OA. Any objective data about lung function predating a work exposure suspected of causing or exacerbating asthma can provide valuable baseline data. Typically, however, in the previously asymptomatic individual, lung function studies will never have been performed. Serial peak expiratory flow monitoring with a handheld ambulatory meter or spirometry demonstrating changes in airflow temporally related to work support a diagnosis of OA.[3,28]

To date, there is no available local data assessing the extent of work-related and work-aggravated asthma in susceptible populations particularly among health care workers in the hospitals. Determination of the disease burden in the hospitals would be helpful in increasing awareness regarding work-related asthma among the administrative staff, health care workers and other employees. This would hopefully, aid later in the formulation of preventive measures and recommendations for the improvement of the working environment in the various areas of the hospital.

The use of a local questionnaire adaptable to our setting as a screening tool would help clinicians in diagnosing work-related asthma and, eventually, establishing the prevalence of work-related asthma would be facilitated.

## Materials and Methods

*Survey Population*. The following groups of health care workers with active professional licenses were included in this prospective cross-sectional study on work-related asthma: physicians, nurses, radiation technologists, medical technologists, workers in endoscopy units, and workers in orthopedic casting area.

Based on sample size calculations to ensure $\alpha < 0.05$, adjusted for an expected response rate of at least 50% and an expected proportion of eligible respondents of 90%, a total of 110 study participants were selected by random sampling from each of the group of health care workers. Informed consent was obtained from each subject by the investigator prior to the conduct of the study.

Subjects were included or excluded based on the following criteria:

*Inclusion Criteria*: 1) Radiation technologists with active professional licenses working in the Philippine General Hospital Radiology Department 2) Physicians, Nurses, Nursing Aides with active professional licenses working in the Philippine General Hospital Central Endoscopy Unit and GI Endoscopy Unit 3) Physicians and laboratory technicians with active professional licenses working in the Philippine General Hospital Department of Laboratory and Pathology 4) Physicians, nurses and occupational therapists with active professional licenses working in the Philippine General Hospital Orthopedic Cast Removal Unit (Outpatient Department), and 5) Employees assigned at the Medical Records Division of the Philippine General Hospital.

*Exclusion Criteria*. Subjects with physician-diagnosed Bronchial Asthma prior to present occupation.

*Survey Instrument Validation*. The validated questionnaire developed by Delclos *et al*. published in the American Journal of Respiratory Critical Care Medicine in 2007 was used as the basis of our survey

instrument. Permission to use the questionnaire was obtained from the author by e-mail correspondence.

Forward and backward translation methodology for bilinguals was used in this study. Backtranslation and reconciliation was done as a form of linguistic validation translation accuracy, catching of missing parts, deviation of meaning and to unify both versions into one. The original questionnaire by Delclos was translated to Filipino version by a language expert from the Sentro ng Wikang Filipino (questionnaire can be made available upon request to the authors). The Filipino version was then back-translated to English version by another language expert. The questionnaires may be provided upon request.

The resulting 42-item Filipino version questionnaire was self-administered between 8:00am to 5:00pm to 110 health care workers chosen by stratified random sampling. Questionnaires were retrieved as soon as completed. The same respondents were asked to answer the back-translated English version after 24 hours.

*Statistical Analysis*. The responses to each item were tabulated and testing for internal consistency reliability was obtained by computing for the Cronbach's alpha.[29] Construct validity of the Filipino version was subsequently determined by computing for the Cramer's V Coefficient.

*Ethical considerations*. The study protocol was reviewed and approved by the UP Manila Ethics Review Board. The study was conducted following the requirements of the Declaration of Helsinki.

Documents gathered in the study were kept confidential and were exclusively used for research purposes only. Participants were not placed on any form of risk. Participation of the subjects was of their own free will. Participants were allowed to withdraw anytime from the study for whatever reason.

The investigators of the study have no conflict of interest whatsoever. All expenses incurred in the study were shouldered solely by the investigators.

## Results

*Demographics of the Study Population*. A total 110 healthcare workers participated in the study. All prospective participants invited consented for inclusion in the study. Descriptive statistics of the study population are summarized in *Table I*.

Of the 110 respondents, majority of them were females (61.26%), with a mean age of 40.68 years (SD: +/- 11.54 years). Based on random sampling done from the pool of health care workers, 34.55% of the total participants were medical technologists. Majority of these respondents were college graduates (81/110, 73.64%). The mean number of years they have worked in their respective health professions was 15.16 years (SD: ± 10.96 years).

**Table I. Description of the Study Population**

| Parameter | Number (%) |
|---|---|
| Male | 42 37.74% |
| Female | 68 62.26% |
| Doctors | 12 10.91% |
| Nurses | 5 4.55% |
| Radiology Technicians | 18 16.3% |
| Medical Technologists | 38 34.55% |
| Medical Records Officer | 37 33.4% |
| Smokers | 93 84.55% |
| Non-smokers | 17 15.45% |
| Mean Age | 40.68 years |
| Mean Number of years at present occupation | 15.16 years |

**Table II. Cronbach's alpha of the Filipino version of a Questionnaire for Work-related Asthma.**

| Domain | Inter-item covariance | Cronbach's alpha |
|---|---|---|
| A. Nahihirapan sa paghinga | 0.0177305 | 0.1145 |
| B. Hika | 0.0829302 | 0.4222 |
| C. Humuhuni, sumisipol, kinakapos ng paghinga | 0.0720616 | 0.6416 |
| D. Alagang hayop, hayop, Mga allergy | 0.1439041 | 0.8966 |
| E. Bahay | 0.0416299 | 0.5168 |
| F. Kasaysayang panghanapbuhay | 2.796693 | 0.9365 |
| G. Kasaysayang panghanapbuhay | 0.1521021 | 0.5494 |
| H. Hanapbuhay/trabaho | 0.2250868 | 0.9684 |
| I. Libangan | 0.4325132 | 0.9659 |
| **Overall** | **0.0681523** | **0.9016** |

Most of the respondents had a history of smoking (88/110, 80%). Among the 110 who had smoked, 93 (84.55%) were smokers at the time of data collection, most consuming less than half pack of cigarettes per day (94/110, 85.45%).

There were no dropouts during the course of data collection and all data were collected and analyzed accordingly.

*Internal Consistency*. Excluding questions on demographics, the questionnaire consisted of 33 items, subdivided into nine domains. The answers to each item and their percentages were tabulated and summarized (*Appendix A*). Cronbach's alpha for each of the nine domains were computed to check for the internal consistency reliability of the Filipino version of the questionnaire.

As shown in *Table II*, the Filipino version of the questionnaire on work-related asthma showed good internal consistency, indicated by the overall Cronbach's alpha of 0.9016, which translates to high reliability of this survey instrument. This result is comparable to that of the original questionnaire by Delclos, which also yielded a high Cronbach's alpha (≥0.86). Our survey instrument, therefore, has excellent reliability.

*Construct Validity*. Excluding questions on demographics and those that are open-ended and generate ratio data, items that involve nominal variables were selected and tested for construct validity using Cramer's V, a measure of association based on Chi-Square test. Responses for each item from the Filipino and English versions of the questionnaires were tabulated and correlated. For questions with sub-items, Cramer's V coefficients were averaged. Results are shown on *Appendix B*.

The Cramer's V coefficients of our survey instrument ranged from 0.2204 (strong relationship) to 0.7843 (very strong relationship), with p-values <0.05. Overall, this indicates that the Filipino version of the questionnaire for work-related asthma indeed has good validity and is comparable to the original English by Delclos.

## Discussion

The major classifications of occupational exposures that cause new-onset asthma are: 1) high-molecular weight compounds; 2) low-molecular-weight compounds; and 3) high-level-irritant inhalant exposures. Those who acquire asthma after exposure to these inhalants develop a chronic disease that presumably would never have developed had they not been exposed. Among susceptible individuals, continued exposure to these inhalants can be expected to result in progressive worsening of asthma and may even persist years after removal from these exposures.[3,7-10]

In contrast with agents that appear to require immune system participation to cause asthma, irritant inhalant exposure in high concentrations can cause asthma through apparently non-immunological mechanisms. Short-term, high-level exposure to irritant fumes, vapors, or smoke can cause reactive airways dysfunction syndrome (RADS). This type of asthma usually results from a single major industrial accident and symptoms typically develop within hours of the exposure.

Strictly defined, the affected individual may not have had a preexisting diagnosis of asthma or a syndrome of reversible airflow obstruction.[11-13] Gases, dust, smoke, and particles have all been shown to cause airflow limitation in people with asthma.[14] Chlorine gas is the most common irritant gas exposure encountered particularly among workers in textile, pulp bleaching, and water purification industries.[15] Dust can be encountered in any industry that involves movement, disruption, or disintegration of either organic or inorganic materials including farming, construction, mining, and certain manufacturing procedures. Smoke is a complex mixture of gases and particulates that results from incomplete combustion. Smoke inhalation resulting from structural fires is a well-recognized cause of airflow obstruction and an obvious occupational hazard among firefighters.[16]

Cigarettes are another relevant source of smoke exposure despite restrictions on smoking in the workplace. Consequently, secondhand cigarette smoke remains a relevant noxious inhalant, particularly among indoor workers such as restaurant and bar workers and some flight attendants.[17]

Finally, inhalational exposure of very small particles in the micron and submicron range (such as ambient air pollutants), have a deleterious effect on airway function among those with asthma through nonspecific mechanisms to cause bronchospasm.

Immunological occupational asthma (OA) is induced by a variety of high and low molecular weight sensitizing agents, whereas irritant-induced asthma results from the persistent effects of single or multiple exposures to high concentrations of irritant substances. Work-place exposure can also cause work-aggravated asthma where symptoms are aggravated in workers with pre-existing or coincident asthma.[17-19]

Validation of instruments is defined as the process of determining whether there are grounds for ascertaining that the instrument measures what it is intended to measure, or it is suitable for its intended purpose.[30] Validity is a measure of precision. This is different from reliability which is only a measure of accuracy. A reliable instrument may not necessarily be valid.[31] Hence, it is important to measure both.

Several types of validation studies can be done, depending on whether the outcome is qualitative or quantitative in nature. Examples are Construct validity, Content validity, Criterion validity, Face validity and several others. For the purposes of discussion, only the first two will be focused on.

Construct Validity was the one employed in this study. It is done determining the correlation between the Filipino version and the English back-translated questionnaires. Construct Validity is a test to determine the nearness of the meaning of the two versions of the same question. This is measured by correlating the responses to the individual items in the two versions using the Cramer's coefficient or correlation.[32]

Cramer's V is used to calculate correlations in tables with more than 2 x 2 columns and rows. Cramer's V correlation value varies between 0 and 1. A value close to 0 means that there is very little association between the variables, while, a coefficient value close to 1 indicates a very strong association, as enumerated in *Appendix D*. Suffice to say that a value close to 1 means that the answers to the same item in the two questionnaires correlated well. However, its use is limited only for quantitative and scaled data.[32]

For cases where quantitative data analysis is difficult, or the data is not scaled, Content Validity can be used instead. Unlike construct validity, content validity relates to the adequacy of the content of an instrument in terms of the number and scope of the individual questions that it contains. This type of validity is not based on the scores from the scale, but only on judgment of experts regarding the contents of the items.[32]

Validation of a questionnaire on work-related asthma among health care workers was first done by Delclos and colleagues in 2007. Initial development of the English version questionnaire was performed by a multidisciplinary team of industrial hygienists, occupational and pulmonary physicians,

epidemiologists, and survey design experts. Asthma symptom items were originally derived from the International Union against Tuberculosis and Lung Diseases bronchial symptoms questionnaire, supplemented with questions on physician diagnosed asthma and age at asthma diagnosis. The final English version consisted of 43 questions divided into 9 domains. Delclos tested this questionnaire for reliability and validity by comparing it with the result of the subjects' bronchial challenge testing, an interview with an industrial hygienist, and measurement of specific IgE antibodies to common aeroallergens. Overall, validation of this questionnaire yielded good result. [33]

Our Filipino version of the questionnaire on work-related asthma is the first of its kind. To date, no local translation of the questionnaire has been done and validated. The use of a survey tool suitable to the study population's native language is of great value as differences between race and cultures do exist. Response to the questionnaire will vary depending on how well the subjects know the language and fully understood the questions. Nonetheless, the Filipino translation used in our study showed good results, as proven by its excellent reliability and validity. Although this was tested only among the high-risk group of health care workers in our hospital, this, likewise, might show uniformity when administered to other sets of healthcare workers in other institutions. This questionnaire, therefore, seems to be a suitable screening tool for identifying Filipino health care workers at risk of having OA.

It is known that establishing a diagnosis of asthma of occupational origin is difficult, as no gold standard for the diagnosis exist. As mentioned earlier, no single test clinches the diagnosis. Specific airway challenges with suspected agents in an exposure laboratory, although mentioned in literature as the reference standard, are not widely available or validated. Moreover, they are complicated and cannot fully replicate real-world exposure settings. Hence, their use remains largely confined to research.[3] Guidelines recommend obtaining a good and detailed history, physical examination, and performing serial lung function tests to establish a diagnosis of work-related asthma. However, we must consider that no physical exam finding is specific for OA. Thus, much attention should be given to the temporal relation of symptoms and exposure to the workplace, as this might help establish the link between these manifestations and a possible disease.

In general, poor detection and control of asthma can significantly increase the overall burden of the disease. It can result to impaired work-effectiveness of affected individuals while they are on their job, increase asthma-related lost work days, reduction in income due to poor productivity, and may also lead to decrease in employment rates. It may also lead to work disability and to the extent of changing the job of the affected individual as an adjustment to the asthmatic condition. In the long run, this can augment the functional impairment which may result if asthma is not adequately addressed.[23,24,26,27,34]

Hence, screening and early detection is very important. One of the cheapest and readily available alternative tools is the use of a validated local questionnaire such as this one reported here. Furthermore, this questionnaire may be utilized to establish the prevalence of OA in hospitals and later on, aid in the development of policies, preventive measures and a better working environment for the health care workers. In the end, we should not be only aiming for the health of our patients who are the end-stakeholders, but the health of the whole team of health care providers as well.

## Conclusion and Recommendations

In summary, the Filipino Version of the questionnaire on work-related asthma tested among the health-care workers of the Philippine General Hospital has good reliability and validity. This questionnaire can now be used to screen for OA among the Filipino healthcare workers as they are the ones at increased risk of developing the disease. The use of a questionnaire suitable to our local setting as a screening tool would not only aid clinicians in diagnosing work-related asthma. This could also help them in the event when other special tests for asthma are not available. This questionnaire can likewise be utilized to establish the prevalence of work-related asthma in our hospital and the likes. Once the magnitude of the disease has been established, recommendations on the protection of health care workers can be reinforced and prevention of this disease can eventually be facilitated.

We recommend that the local version of this questionnaire be tested and validated as well among other sets of healthcare workers from different hospitals. We also recommend translation to other dialects and validation to further establish the diagnostic strength of this survey tool.

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**Conflict of Interest.** The authors declare no conflicts of interest.

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## APPENDIX A

**Percentage of responses Health Care Workers to the Filipino Version of the Questionniare on Work-related Asthma at Philippine General Hospital.**

| Items | Answers |
|---|---|
| A. Nahihirapan sa paghinga | |
| 1. Mayroon ka bang nararanasang hirap sa paghinga? | No answer- 2.13%<br>Oo- 19.15%<br>**Hindi-** 73.40**%**<br>Hindi alam- 5.32% |
| 1.1 Kung OO, anung uri ng hirap ang iyong nararanasan? | **No answer-** 5.32**%**<br>Patuloy ang paghinga pero hindi maayos- 3.64%<br>Paulit-ulit pero bumubuti - 3.64%<br>Bihirang-bihira- 15.45% |
| 1.2 Kung OO, ang nararanasang kahirapan sa paghinga ba ay dahil sa kapaligiran ng pinapasukang paghahanapbuhay? | **No answer**- 79.09 **%**<br>Oo- 10.91%<br>Hindi- 4.55%<br>Hindi alam- 5.45% |
| 2. Nagkaroon ka na ba ng hika? | No answer- 2.73%<br>Oo- 15.45%<br>**Hindi-** 77.27**%**<br>Hindi alam- 4.55% |
| 2.1 Kung OO, sinabi ba ito ng doctor? | **No answer- 74.55%**<br>Patuloy ang paghinga pero hindi maayos- 11.82%<br>Paulit-ulit pero bumubuti - 10.91%<br>Bihirang-bihira- 2.73% |
| 2.2 Kung OO, sa anung edad ito natukoy ng doctor? | **No answer- 87.27%**<br>**Mean: 26.85 years** |
| B. Hika | |
| 3. Nagkaroon ka ba ng hika sa nakalipas na 12 buwan? | No answer- 7.27%<br>Oo- 10%<br>**Hindi- 79.09%**<br>Hindi alam- 3.64% |
| 3.1 Kung OO, ilang beses kang sinumpong sa nakalipas na 12 buwan? | **0o- 90.91%**<br>**Mean- 2.1** |
| 3.2 Nagkaroon ka ba ng hika habang ikaw ay nasa trabaho sa nakalipas na 12 buwan? | **No answer- 74.55%**<br>Oo- 9.09%<br>Hindi- 16.36% |
| 3.2.1 Kung OO, alam mo ba kung ano pa and pinagsimulan ng pag-atake mo habang ikaw ay nasa trabaho? | **No answer- 88.18%**<br>Oo- 5.45%<br>Hindi- 6.36% |
| 3.2.1.a. Kung OO, ano ang pinagsimulan nito? | Init- 12.5%<br>Kakaibang amoy- 12.5%<br>Alikabok- 12.5%<br>Chemicals- 12.5%<br>Cough- 12.5%<br>Weather- 12.5%<br>Pintura- 12.5%<br>Ubo at sipon- 12.5% |
| 3.3 Nagkaroon ba ng pagkakataon na di ka nakapasok sa trabaho dahil sa hika sa nakalipas na 12 buwan? | **No answer- 68.18%**<br>Oo- 4.55%<br>Hindi- 26.36%<br>Hindi alam- 0.91% |
| | **No answer- 95.45%** |

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| 3.3.1 Kung OO, ilang araw kang di nakapasok sa trabaho/gawain dah sa hika?___ araw | **Mean- 2 days** |
| 4. Sa kasalukuyan, may iniinom ka bang gamut sa hika kasama na ang gamut na nilalanghap, aerosols or tablet? | No answer- 9.09%<br>Oo- 3.64%<br>**Hindi- 87.27%** |
| C. **Humuhuni, sumisipol, kinakapos ng paghinga** | |
| 5. Nagkaroon ba ng paghuni o pagsipol sa inyong paghinga sa nakalipas na 12 buwan? | No answer- 0.91%<br>Oo- 11.82%<br>**Hindi- 82.73%**<br>Hindi alam- 4.55% |
| 5.1 Kung OO, magkaroon ba ng paghuni o pagsipol sa inyong paghinga kahit walang sipon sa nakalipas na 12 buwan? | **No answer- 80.00%**<br>Oo- 7.27%<br>Hindi- 12.73% |
| 5.2. Nagkaroon ba ng paghuni o pagsipol sa inyong paghinga habang ikaw ay nasa bahay sa nakalipas na 12 buwan? | **No answer- 76.36%**<br>Oo- 9.09%<br>Hindi- 14.55% |
| 5.3. Nagkaroon ba ng paghuni o pagsipol sa inyong paghinga habang ikaw ay nasa trabaho/gawain sa nakalipas na 12 buwan? | **No answer- 77.27%**<br>Oo- 9.09%<br>Hindi- 13.64% |
| 5.4. Habang ikaw ay wala pa sa trabaho/gawain kahit anung oras sa nakalipas na 12 buwan ang paghuni o pagsipol ba sa inyong paghinga ay: | **No answer- 82.73%**<br>Mas masama- 0.91%<br>Mas mabuti- 8.18%<br>Walang pagbabago- 8.18% |
| 5.5. Pagkatapos mong bumalik sa trabaho/gawain kahit anung oras sa nakalipas na 12 buwan ang paghuni o pagsipol ba sa inyong paghinga ay: | **No answer- 84.55%**<br>Mas masama- 2.73%<br>Mas mabuti- 6.36%<br>Walang pagbabago- 6.36% |
| 5.6. Nang ikaw ay di pumapasok ng 5 araw nang tuloy-tuloy o mahigit pa sa kahit anung oras sa nakalipas na 12 buwan ang paghuni o pagsipol sa inyong paghinga ay: | **No answer- 83.64%**<br>Mas masama- 0<br>Mas mabuti- 10.00%<br>Walang pagbabago- 6.36% |
| 5.7. Nang bumalik ka sa iyong trabaho pagkatapos ng 5 araw o mahigit pa nang tuloy-tuloy na di mo pagpasok kahit anung oras sa nakalipas na 12 buwan ang paghuni o pagispol sa inyong paghinga ay: | **No answer- 84.55%**<br>Mas masama- 1.82%<br>Mas mabuti- 8.18%<br>Walang pagbabago- 5.45% |
| 5.8. May mga araw ba na ikaw ay di nakakapasok dahil sa paghuni o pagsipol sa iyong paghinga? | **No answer- 75.45%**<br>Oo- 4.55%<br>Hindi- 20.00% |
| 5.8.1. Kung OO, ilang araw kang di nakapasok sa nakalipas na 12 buwan? ____araw | **No answer- 94.55%**<br>**Mean: 1.5** |
| 6. Nagkaroon ka ba ng atake/kahirapang huminga kahit anung oras sa nakalipas na 12 buwan? | No answer- 2.73%<br>Oo- 16.36%<br>**Hindi- 77.27%**<br>Hindi alam- 3.64% |
| 6.1. Nagkaroon ka ban g atake/kakapusan sa paghinga dahil sa mga sunod-sunod, mabigat na Gawain kahit anung oras sa nakalipas na 12 buwan? | **No answer 72.73%**<br>Oo- 9.09%<br>Hindi- 18.18% |
| 6.2. Nagkaroon ka ba ng atake/kakapusan sa paghinga habang kayo ay nasa labas o loob ng bahay kahit anung oras sa nakalipas na 12 buwan? | **No answer- 73.64%**<br>Oo- 11.82%<br>Hindi- 14.55% |
| 6.3 Nagkaroon ka ba ng atake/kakapusan ng paghinga habang ikaw ay nasa trabaho kahit anung oras sa nakalipas na 12 buwan? | **No answer- 73.64%**<br>Oo- 12.73%<br>Hindi- 13.64% |
| 6.4 Habang ikaw ay di pumapasok sa trabaho ang pag-atake/kakapusan ng paghinga kahit anung oras sa nakalipas na 12 buwan ay: | **No answer- 79.09%**<br>Mas masama- 0.91% |

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| | Mas mabuti- 10.91%<br>Walang pagbabago- 9.09% |
| 6.5 Pagkatapos mong bumalik sa trabaho ang pag-atake/kakapusan ng paghinga kahit anung oras sa nakalipas na 12 buwan ba ay: | **No answer- 80.00%**<br>Mas masama- 3.64%<br>Mas mabuti- 8.18%<br>Walang pagbabago- 8.18% |
| 6.6. Habang ikaw ay malayo sa inyong trabaho ng 5 araw o mahigit pa ng sunod-sunod ang iyong pa-atake/kakapusan ng paghinga kahit anung oras sa nakalipas na 12 buwan ba ay: | **No answer- 80.00%**<br>Mas masama- 10.91%<br>Mas mabuti- 9.09% |
| 6.7. Nang ikaw ay bumalik sa inyong trabaho ng 5 araw o mahigit pa ng sunod-sunod ang iyong pag-atake/kakapusan ng paghinga sa kahit anung oras sa nakalipas na 12 buwan ba ay: | **No answer- 82.73%**<br>Mas masama- 4.55%<br>Mas mabuti- 6.36%<br>Walang pagbabago- 6.36% |
| 7. Nagising ka ba sa gabi dahil da pag-atake/pagsumpong ng kahit na alin sa mga sumusunod na sintomas na nakalipas na 12 buwan:<br>a. Ubo | No answer- 3.64%<br>Oo- 40.00%<br>**Hindi- 56.36%** |
| b. Kapos na paghinga | No answer- 24.55%<br>Oo- 9.09%<br>**Hindi- 66.36%** |
| c. Paninikip sa dibdib | No answer- 25.45%<br>Oo- 7.27%<br>**Hindi- 67.27%** |
| D. <u>Alagang hayop, hayop, mga allergy</u> | |
| 8. Sa <u>kasalukuyan</u> alin sa mga sumusunod ang alaga mong hayop sa bahay?<br>a. Aso | No answer- 1.82%<br>Oo- 42.73%<br>**Hindi- 55.45%** |
| b. Pusa | No answer- 14.55%<br>Oo- 15.45%<br>**Hindi- 70.00%** |
| c. At ibang alagang hayop | No answer- 27.27%<br>Oo- 7.27%<br>**Hindi- 65.45%** |
| 9. Nakatira ka ba na kasama ang alinman sa mga sumusunod na alagang hayop sa bahay?<br>a. Aso | No answer- 6.36%<br>Oo- 40.00%<br>**Hindi- 53.64%** |
| b. Pusa | No answer- 22.02%<br>Oo- 13.76%<br>**Hindi- 64.22%** |
| c. At ibang alagang hayop | No answer- 30.91%<br>Oo- 9.09%<br>**Hindi- 60.00%** |
| 10. Nagkaroon ka na ba ng alinman sa mga sumusunod na karamdaman?<br>a. Pagbabara ng ilong, sinus allergy na may hay fever<br>b. Eksema o kahit anung uri ng allergy sa balat<br>c. Malimit na paninikip ng dibdib<br>d. Mahigit na 6 na impeksyon sa baga sa loob ng isang taon<br>e. Mga allergy sa kemikal<br>f. Mga allergy sa gamot<br>g. Mga allergy sa hayop<br>h. Mga allergy sa alikabok o hanip (dust mite)<br>i. Mga allergy sa latex o mga product ng latex katulad ng ace bandage/adhesive tape/condoms/gloves | Oo- 40.00%<br>Oo- 29.09%<br>Oo- 5.45%<br>Oo- 2.73%<br>Oo- 15.45%<br>Oo- 14.55%<br>Oo- 9.09%<br>Oo- 44.55%<br>Oo- 11.82% |

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| 11. Kung ikaw ay malapit sa mga hayop (pusa/aso/kabayo), balahibo (unan/kubrekama/duvets), o alikabok sa bahay, nagkakaroon ka ba ng: | |
| a. Pangangati o pagluluha ng mata | No answer- 2.73%<br>Oo- 29.09%<br>**Hindi- 68.18%** |
| b. Nakakaramdam ng paninikip ng dibdib | No answer- 8.18%<br>Oo- 7.27%<br>**Hindi- 84.55%** |
| 12. Kung ikaw ay malapit sa mga punong kahoy, damo o bulaklak o kung maraming nakapaligid sa iyong pollen, nagkaroon ka ba ng pangangati o pagluluha ng mata: | No answer- 3.64 %<br>Oo- 12.73%<br>**Hindi- 83.64 %** |
| 13. Ilan sa inyong pimakamalapit na miyembro ng pamilya (magulang/kapatid/anak) ang nagkaroon ng mga sumusunod na karamdaman? | |
| a. Hika | No answer- 5.45%<br>Oo- 40.91%<br>**Hindi- 46.36%**<br>Hindi alam- 7.27% |
| b. Hay fever, eksema, o allergy sa balat | No answer- 12.73%<br>Oo- 34.55%<br>**Hindi- 43.64%**<br>Hindi alam- 9.09% |
| E. **Bahay o inuupahang bahay** | |
| 14. Sa inyong bahay o inuupahang bahay mayroon ka bang mga sumusunod: | |
| a. Gaas | No answer- 9.09%<br>**Oo- 63.64%**<br>Hindi- 27.27% |
| b. Fireplace | No answer- 20.91%<br>Oo- 3.64%<br>**Hindi- 75.45%** |
| c. Air-conditioner | No answer- 6.36%<br>**Oo- 58.18%**<br>Hindi- 35.45% |
| 15. May mga katangian ba ang inyong bahay o inuupahang bahay ng mga sumusunod? | |
| a. May mga kurtina sa kahit na anong kuwarto sa inyong bahay o inuupahang bahay | Oo- 85.45% |
| b. May nakadikit bang karpet sa dingding ng inyong bahay o inuupahang bahay | Oo- 5.45% |
| c. Nagbobomba bang pamatay insekto kada 3 buwan | Oo- 40.00% |
| d. May malaki bang lugar sa inyong bahay ang may amag, tagulamin o kasalukuyang agusan ng tubig | Oo- 14.55% |
| e. Ang inyong bahay o inuupahang bahay ay orihinal itinayo bago mag 1973 | Oo- 17.27% |
| F. **Kasaysayang panghanapbuhay** | |
| 16. Sa anung buwan at taon ka nagsimula sa iyong kasalukuyang or pinakabagong hanapbuhay? | Varied responses |
| 17. Sa anung buwan at taon ka huminto sa hanapbuhay na ito? | Varied responses<br>**Mean: 29.61** |
| 18. Ilang oras kada lingo kasama ang obertaym ang ginugugol mo sa trabahong ito? _____ oras | No answer- 19.09%<br>Oo- 21.82%<br>**Hindi- 59.09%** |
| 19. Sa mga panahong ito, ikaw ba ay mag-aaral sa hanapbuhay na ito? | 0- 18.18% |
| 20. Anung uri ng negosyo o kalakalan ito? | Departamentong Pangkalusugan- 6.36%<br>Kalakalang Medikal- 2.73%<br>Laboratory- 0.91%<br>Medical Records- 1.82% |

| | |
|---|---|
| | Outpatient Clinic- 0.91%<br>Pagamutan- 78.18%<br>Residency Training- 0.91% |
| 21. Ano ang tawag sa iyong hanapbuhay? | Allied Health Prof- 27.27%<br>Med Tech- 20.00%<br>Others- 72.73% |
| 22. Habang ikaw ay nasa ganitong uri ng hanapbuhay gaano ka kadalas humawak o nakalantad ka sa alinmang sumusunod na mga produkto? | |
| a. Pamatay ng mikrobyo | No answer- 24.55%<br>Mahigit isang araw- 13.64%<br>**Araw-araw- 31.82%**<br>Isang beses isang linggo- 8.18%<br>Isang beses isang buwan- 2.73%<br>Hindi- 19.09% |
| b. Kemikal | No answer- 21.82%<br>Mahigit isang araw- 13.64%<br>**Araw-araw- 30.00%**<br>Isang beses isang linggo- 5.45%<br>Isang beses isang buwan- 4.55%<br>Hindi- 25.45% |
| c. Latex gloves/produkto | No answer- 18.18%<br>Mahigit isang araw- 10.91%<br>**Araw-araw- 40.00%**<br>Isang beses isang linggo- 3.64%<br>Isang beses isang buwan- 4.55%<br>Hindi- 22.73% |
| d. Gamot na pinapausok (aerosolized) | No answer- 29.09%<br>Mahigit isang araw- 2.73%<br>Araw-araw- 2.73%<br>Isang beses isang linggo- 5.45%<br>Isang beses isang buwan- 4.55%<br>**Hindi- 55.45%** |
| e. Pandikit (adhesives/glues) | No answer- 26.36%<br>Mahigit isang araw- 6.36%<br>Araw-araw- 12.73%<br>Isang beses isang linggo- 4.55%<br>Isang beses isang buwan- 13.64%<br>**Hindi- 36.36%** |
| f. Gas/vapors | No answer- 27.52%<br>Mahigit isang araw- 8.26%<br>Araw-araw- 13.76%<br>Isang beses isang linggo- 2.75%<br>Isang beses isang buwan- 3.67%<br>**Hindi- 44.04%** |
| G. **Kasaysayang panghanapbuhay** | |
| 23. Ang iyong kasalukuyang o pinakabagong hanapbuhay ay siya rin bang iyong pinakamatagal mong hanapbuhay? | No answer- 5.45%<br>**Oo- 90.00%**<br>Hindi- 4.55% |
| 24. Sa anung buwan at taon ka huminto sa hanapbuhay na ito? | Varied responses |
| 25. Sa anung buwan at taon ka huminto sa hanapbuhay na ito? | Varied responses |
| 26. Ilang oras kada lingo ang iyong ginugugol sa hanapbuhay na ito kasama ang overtime?_____oras | **Mean: 6.33** |
| 27. Sa mga panahon na ito, ikaw ba ay mag-aaral sa hanapbuhay na ito? | **No answer- 73.64%**<br>Oo- 5.45%<br>Hindi- 20.00%<br>Hindi alam- 0.91% |
| 28. Anung uri ng negosyo o kalakalan ito? | No answer- 8.18% |

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| | **Pagamutan- 78.18%**<br>Departamentong Pangkalusugan- 6.36%<br>Medical Records- 1.81%<br>Laboratoryo- 0.91%<br>Outpatient- 0.91%<br>Residency- 0.91%<br>Kalakalang Medikal- 2.72% |
| 29. Ano ang tawag sa iyong hanapbuhay? | No answer- 9.09%<br>Med Tech- 20%<br>**Allied Health Prof- 27.27%**<br>Clerical- 8.18%<br>Records officer- 8.18%<br>Manggagamot- 9.09%<br>Clerk- 7.27%<br>Nars- 4.55%<br>Rad tech- 6.36% |
| 30. Habang ikaw ay nasa ganitong uri ng hanapbuhay, gaano kadalas, sa katamtaman mo hinawakan o nakalantad sa kahit na alin sa mga sumusunod na produkto? | |
| a. Pamatay ng mikrobyo | **No answer- 79.09%**<br>Mahigit isang araw- 2.73%<br>Araw-araw- 7.27%<br>Isang beses isang linggo- 1.82%<br>Isang beses isang buwan- 0<br>Hindi- 9.09% |
| b. Kemikal | **No answer- 76.36%**<br>Mahigit isang araw- 1.82%<br>Araw-araw- 7.27%<br>Isang beses isang linggo- 3.64%<br>Isang beses isang buwan- 0.91%<br>Hindi- 10.00% |
| c. Latex gloves/produkto | **No answer 74.55%**<br>Mahigit isang araw- 3.64%<br>Araw-araw- 9.09%<br>Isang beses isang linggo- 1.82%<br>Isang beses isang buwan- 1.82%<br>Hindi- 9.09% |
| d. Gamot na pinapausok (aerosolized) | **No answer- 79.09%**<br>Mahigit isang araw- 0.91%<br>Araw-araw- 0.91%<br>Isang beses isang linggo- 0.91%<br>Isang beses isang buwan- 0.91%<br>Hindi- 17.27% |
| e. Pandikit (adhesives/glues) | **No answer- 78.18%**<br>Mahigit isang araw- 0.91%<br>Araw-araw- 3.64%<br>Isang beses isang linggo- 0<br>Isang beses isang buwan- 3.64%<br>Hindi- 13.64% |
| f. Gas/vapors | **No answer- 78.18%**<br>Mahigit isang araw- 0.91%<br>Araw-araw- 4.55%<br>Isang beses isang linggo- 0<br>Isang beses isang buwan- 0.91%<br>Hindi- 15.45% |
| 31. Ikaw ba ay nakaranas na ng mga sakuna ng pagbuhos ng kemikal o paglabas ng gaas? | No answer- 2.80%<br>Oo- 19.63%<br>**Hindi- 75.70%**<br>Hindi alam- 1.87%<br>**No answer- 67.27%** |

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| 31.1. Ang sakuna ng pagbuhos ng kemikal o paglalabas ng gaas ay nagyari sa inyong hanapbuhay? | Oo- 17.27%<br>Hindi- 15.45% |
| 31.2 Kailan nangyari ang sakuna ng pagbuhos ng kemikal o pagpapalabas ng gaas? | 0o- 95.24% |
| 31.3 Saan ka nakalantad? | 0o - 100% |
| 31.4 Sa paano ka nakalantad? | |
| a. Paghinga | No answer- 80.00%<br>Oo- 15.45%<br>Hindi- 4.55% |
| b. Direkta sa balat | No answer- 82.73%<br>Oo- 8.18%<br>Hindi- 9.09% |
| c. Paglunok/paglulon | No answer- 88.18%<br>Hindi- 11.82% |
| 31.5 Gaano ka katagal nakalantad sa sakuna ng pagbuhos ng kemikal o pagpapalabas ng gaas? | No answer- 80.00%<br>Mababa sa isang oras - 10.91%<br>1 hanggang 8 oras - 5.45%<br>9 hanggang 24 oras - 0<br>Mahigit sa 24 oras - 0<br>Hindi alam/hindi maalala- 3.64% |
| 31.6 Kinakailangan bang tingnan ka ng doctor dahil sa aksidente/pagsabog? | No answer- 79.09%<br>Oo- 0.91%<br>Hindi- 19.09%<br>Hindi alam- 0.91% |
| 31.7 Sa unang 24 oras pagkatapos ng aksidente/pagsabog nakaranas ka ban g kahit na anu sa mga sumusunod na sintomas? | |
| a. Kapos sa paghinga | Oo- 3.64% |
| b. May paghuni sa paghinga | Oo- 1.82% |
| c. Ubo | Oo- 5.45% |
| d. Paninikip ng dibdib | Oo- 2.73% |
| 31.7.1 Matapos ang aksidente, kelan mo napansin ang sintomas ng aksidente/pagsabog? | No answer- 94.55%<br>Mahigit sa 24 oras - 1.82%<br>1 hanggang 24 oras - 2.73%<br>25 oras hanggang isang linggo - 0<br>Mahigit sa isang linggo - 0<br>Hindi alam/hindi maalala - 0.91% |
| 31.7.2 Gaano tumagal ang sintomas? | No answer - 93.64%<br>Mahigit sa 24 oras - 4.55%<br>1 hanggang 24 oras - 0.91%<br>25 oras hanggang isang linggo - 0<br>Mahigit sa isang linggo - 0<br>Hindi alam/hindi maalala - 0.91% |
| H. Hanapbuhay/trabaho | |
| 32. Isipin mo ang lahat ng iyong nagging hanapbuhay. Sa abot ng iyong kaalaman, gumamit/humawak ka bas a kahitalin sa mga sumusunod na kagamitan kahit isang beses kada buwan sa loob ng 6 na buwan o mahaba pa? | |
| a. Bleach/pampaputi | Oo- 50.00% |
| b. Panglinis ng silid at sa ibababaw ng mesa | Oo- 72.73% |
| c. Panglinis/adhesives | Oo- 56.36% |
| d. Panglinis sa paliguran at banyo | Oo- 60.00% |
| e. Sabon | Oo- 90.91% |
| f. Pamatay sa mikrobyo | Oo- 73.64% |
| g. Cidex ™ (glutaraldehyde) | Oo- 24.55% |
| h. Cidex OPA ™ (ortho-phtaldehyde) | Oo- 3.64% |
| i. Chloramines | Oo- 6.36% |
| j. Adhesives or glues | Oo- 49.09% |

| | |
|---|---|
| k. Amonya | Oo- 15.45% |
| l. Pamatay insekto/pesticides | Oo- 52.73% |
| m. Pintura (acrylics, stains, varnishes) | Oo- 34.55% |
| n. Usok ng sigarilyo | Oo- 49.09% |
| o. Solvents (toluene, xylene, benzene, mineral spirits, paint thinners) | Oo- 44.55% |
| p. Toner para sa copiers/printers | Oo- 19.09% |
| q. Pampamanhid | Oo- 16.36% |
| r. Antibiotic | Oo- 49.09% |
| s. Contra-bacteria | Oo- 33.64% |
| t. Bronchodilators | Oo- 10.00% |
| u. Iodine (Povidone iodine, Betadine ™) | Oo- 62.73% |
| v. Gamot na nebulized (pentamidine or ribavirin) | Oo- 13.64% |
| w. Pulbos | Oo- 59.09% |
| x. Acetaldehyde | Oo- 8.18% |
| y. Alkali | Oo- 3.64% |
| z. Ethylene oxide | Oo- 4.55% |
| aa. Formalin/Formaldehyde | Oo- 34.55% |
| bb. Nitric oxide | Oo- 6.26% |
| **l. Libangan** | |
| 33. Alin sa mga sumusunod ang iyong palagiang ginagawa/libangan sa loob ng 3 buwan o mahigit pa? | |
| a. Tinapos na kasangkapan | Oo- 10.91% |
| b. Nag-aayos ng sasakyan | Oo- 8.18% |
| c. Gumagawa ng radio o iba pang gamit pangkuryente | Oo- 5.45% |
| d. Gawaing metal kasama na nag pangwelding (katulad ng paggawa ng alahas) | Oo- 1.82% |
| e. Pagpintura na may kasamang acrylics o oil paint | Oo- 9.09% |
| f. Paghahalaman/pagbubukid | Oo- 13.64% |
| g. Gawaing kahoy | Oo- 4.55% |
| h. Libangan na may ginagamitang pandikit | Oo- 13.64% |
| i. Iba pang libangan | Oo- 21.82% |

## APPENDIX B

**Construct Validity of the Filipino Version of A Questionnaire on Work-Related Asthma (Cramer's Coefficient)**

| Question no. | Cramer's V Coefficient | Level of significance |
|---|---|---|
| Q1 | 0.5623 | *** |
| Q2 | 0.5652 | *** |
| Q3 | 0.6225 | *** |
| Q4 | 0.7085 | *** |
| Q5 | 0.5435 | *** |
| Q6 | 0.4940 | *** |
| Q7 | 0.5823 | *** |
| Q8 | 0.5235 | *** |
| Q9 | 0.6303 | *** |
| Q10 | 0.5068 | *** |
| Q11 | 0.5386 | *** |
| Q12 | 0.5050 | *** |
| Q13 | 0.4662 | *** |
| Q14 | 0.4598 | *** |
| Q15 | 0.4770 | *** |
| Q19 | 0.2204 | ** |
| Q20 | 0.4513 | *** |
| Q21 | 0.7843 | *** |
| Q22 | 0.4395 | *** |
| Q23 | 0.6306 | *** |
| Q27 | 0.2814 | *** |
| Q28 | 0.7227 | *** |
| Q29 | 0.3249 | *** |
| Q31 | 0.4748 | *** |
| Q32 | 0.2544 | *** |
| Q33 | 0.4768 | *** |

*Note: *** and ** indicate statistical significance at 1% and 5% probability level (using 95% confidence interval), respectively.*

**Interpretation of Cramer's V Coefficient.**

| Cramer's V | Correlation |
|---|---|
| 25 or higher | Very strong relationship |
| 15 to .25 | Strong relationship |
| 11 to .15 | Moderate relationship |
| 06 to .10 | weak relationship |
| 01 to .05 | No or negligible relationship |