

# EPIDEMIOLOGICAL REVIEW OF THE APPLICATION OF INDONESIAN QUALIFICATION FRAMEWORK (IQF) IN SEVERAL STUDIES ON PUBLIC HEALTH

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## Abstract

*Kerangka Kualifikasi Nasional Indonesia* (KKNI) translated in English as Indonesian Qualification Framework (IQF) consists of 9 levels of competence. The competence of Master degree is equivalent to the 8<sup>th</sup> level of IQF described in Master thesis, and the competence of Doctor degree is equivalent to the 9<sup>th</sup> level of IQF as described in Doctoral thesis. Scientific papers based on research published in scientific journal are usually written by those having Master and/or Doctor degree..

The objective of this epidemiological review is to identify how far the result of several studies on public health published in Scientific Journal reflect the scientific method competence of researchers based on the 8<sup>th</sup> and /or 9<sup>th</sup> levels of IQF.

Based on IQF, those having the degree of Master and Doctor should have the following competence: 1) *to develop the new knowledge through research producing innovative work for Master degree, and original or creative work for doctoral degree*; 2) *to solve the problem of science through inter or multi discipline approach for master degree and through inter, multi and trans discipline approach for doctoral degree*.

According to the competence based on the 8<sup>th</sup> and 9<sup>th</sup> level of IQF, the researcher has to conduct systematic study in term of continuation of thinking starting from title, objective, epidemiological methods (type of design, population & sample and analysis), result, discussion on quality and accuracy of data, causal relationship, and implication, followed by conclusion, recommendation and suggestion. Discussion on the implication should show inter, multi and/or trans disciplinary approach to produce development of knowledge and innovative work for Master degree and creative & original work for doctor degree. Conclusion contains development of knowledge, while recommendation contains how to solve the finding problems. Based on the recommendation, the suggestion are formulated to contain innovative work for Master degree, and creative & original work for Doctor degree. To achieve the objective of this epidemiological review, 8 studies on public health published in scientific journal concerning systematic studies as mentioned above were reviewed.

The results of review of several or all studies are as follows: 1) The type of study design was not relevant to the objective of study; 2) Calculation of sample size was not based on type of study design; 3) There was no statment of sampling procedure; 4) there was no discussion on quality and accuracy of data, causal relationship and implication of studies.

Based on this epidemiological review of 8 articles, conclusion are as follows: IQF has not been applied, because of serious problems in the application of epidemiological methods concerning discussion on data quality and accuracy, causal relationship and its implication; as a consequence, social significance of conclusion, recommendation and suggestion issued by the 8 articles is low in the field of public health. IQF itself has to be socialized among researchers. Hopefully, the readers are stimulated to attempt how they have competence according to the level 8 or 9 of IQF.

**Keywords:** Qualification, epidemiological method, implication of study.

## 1. INTRODUCTION

*Kerangka Kualifikasi Nasional Indonesia* (KKNI) translated in English as Indonesian Qualification Frame (IQF) consists of 9 levels. Master degree is equivalent to the 8<sup>th</sup> level of IQF, and Doctor degree is equivalent to the 9<sup>th</sup> level of IQF. The 8<sup>th</sup> level of IQF has 2 out of 3 following competence:

- *They are able to develop knowledge, technology, and/or art in their scientific field or professional practice*

through research producing innovative and tested work

- They are able to solve the problem of science, technology, and/or art in their scientific field or professional practice through inter or multidiscipline approach.

The 9th level of IQF has 2 out of 3 competences as follows:

- They are able to develop the new knowledge, technology and/or art in their scientific field or professional practice through research producing creative, original and tested work
- They are able to solve the problem of science, technology, and/or art in their scientific field or professional practice through inter, multi and transdiscipline approach

Those graduated as Master and Doctor give lecture in College or University as lecturer, who have to develop their career in academic position starting from *assisten ahli* (expertise assistance), *lektor* (lecturer), *lektor kepala* (senior lecturer) and *professor* (the highest). To achieve this position, they need to have credit point through publication of their scientific paper in Scientific Journal.

The objective of this epidemiological review is to identify how far the results of several studies on public health published in Scientific Journal describe the competence of researchers in the application of the 8th level and the 9th level of IQF.

## 2. METHODS

The epidemiological review of 8 studies are conducted concerning public health namely on worker's pattern (Amran et al, 2012), elder's food consumption (Amran et al et al, 2012), the role of obstetrics and gynecologist (Meiyetriani et al, 2012), malnutrition in children (Kusumawati et al, 2012), cleanness and house sanitation concerning children of < 5 years old (Yudihastuti et al, 2012), neonatal deaths (Abdullah et al, 2012), the level of gamma interferon (Indreswari et al, 2012), and the effect of exercise and diet on pre hypertension (Kamal et al, 203),

Each study is reviewed in the application of systematic study conducted in term of continuation of thinking starting from title, objective, methods, result, discussion, and conclusion of study followed by recommendation and/or suggestion; it means several aspects between the title and the following chapters are continued and related (Lapau, 2013). The review uses epidemiological method including type of study design, population and sample, data collection and data analysis. The type of study design is used based on study objective.

Population and sample consist of calculation of sample size and the procedure of taking representative sample from the population; it means that the result of sample can be generalized to the population. Calculation of sample size is based on the type of study design formulated (WHO, 1986). If the sample size is less than what should be, the  $\alpha$  error and  $\beta$  error become higher, that decrease the validity of the result of study. The collection of data is excluded in this review, because it is more substantial than methodical. But the method of data analysis, which consist of univariate, bivariate and multivariate analysis is included in this review. The result of study is actually the result of analysis; the result of bivariate analysis is not conclusive, while the result of multivariate analysis is more conclusive after discussion of causal relationship.

The section of discussion is concerned with quality and accuracy of data, causal relationship, and implication of study (Lapau, 2013). Quality of data consist of relevancy and validity of data, while accuracy of data consists of relevance, validity and reliability of data (Lapau, 2012). Relevance of data means that whether collected and analyzed data are full enough and relevant to achieve the study objective and prove hypothesis. Validity of data consists of internal and external validity. Internal validity opposite of systematic error and random error. Systematic error consists of selection, information and confounding bias, while random error consists of  $\alpha$  error and  $\beta$  error.

The result of multivariate analysis may identify the true independent variable or exposure which is associated with the dependent variable, and confounding variable which makes confounding bias. Causal relationship between the exposure and the dependent variable is based on Hill criteria (Beaglehole et al, 1993)), if the types of design study used by researcher are *case control study* and *cross sectional study*. Types of design study which directly produce causal relationship are observational study namely *prospective and retrospective cohort studies* and intervention study namely *before and after with control study*, *randomized clinical trial* and *randomized community trial*.

Implication of study is to use the result of causal relationship for conclusion and recommendation; it

means that the researcher recommend to intervene the causal factor. Then based on the recommendation, the suggestion is formulated through *interdiscipline* and multidiscipline approach producing *scientific knowledge development* and *inovative work* (Lapau, 2013). This is what expected by IQF. Thus section of conclusion and recommendation/suggestion has to be based on the section of discussion especially the subsection of implication of study.

### 3. RESULTS

Table 1 shows that 1) the type of study design number 1, 2, 5, 6 and 8 are based on the objective of study, but the type of study design number 3, 4, 5 and 7 are not based on objective of study; 2) in the study number 2, 3, 5, 6 and 8, the population of study are stated, while it is not stated in the study number 1, 4 and 7; 3) Calculation of sample size based on type of study design is not stated in the study number 1, 2, 3, 4, 6, 7 and 8; only the study number 5 that calculate sample size based on study design; and 4) The study number 1, 2, 3, 4, 5, and 6 use one variable, two variable and multi regression analysis, while study number 7 and number 8 use one variable and two variable analysis.

Table 1. The title of study by objective and methods (type of design, population and sampling)

No	The Title of Article	Objective	Research Method		
			Research Design	Population and Sample	Data Analysis
1	Association between replacement of working time and the worker's working pattern	To examine the association between replacement of working and other factors with the worker's working pattern at the production department of of Enka Parahiyangan company in 2008	Cross sectional study	Population was not stated, sample size was 106 without statement of based on study design, but there is statement of sampling procedure.	There is one and two variable analysis by chi square significant test
2	The determinants of the elder's food consumption	To examine several factors associated with the elder's food consumption	Cross sectional study	Population was all elders (108) at tresna werdha budi mulia nursing home in Cipayung,  Sample size was 58, without calculation based on study design, and no information about sampling procedure	The same as above
3	The role of obstetrics and gynecologist	To evaluate the role of obstetrics and gynecologist in decision making to conduct sectio caesaria	Cross sectional study	Population was the females of 25 – 44 years old having history of delivery the last 5 years ago before conducting survey. Sample size was 7471 without clarification of population	The same as above

4	The influence of health care on malnutrition of children of 6 – 24 months old	To evaluate risk factors of malnutrition of children of 6 – 24 months	Case control study The cases were children of 6 – 24 months old suffering from malnutrition. No information about control.	Sample size was 43 cases (malnutrition) and 43 controls (no clarification), no information about sample size based on study design, and no sampling procedure for cases and controls.	The same as above
5	Cleanness and house sanitation concerning children of < 5 years old suffering from worm diseases	To analyze the association between house environment and the occurrence of disease of worm attacking children of < 5 years old	Case control study. The cases were children of < 5 years old having faeces containing larvae of worm. No clarification about control	Population were children of < 5 years old in Sukolilo Surabaya area. The cases were children of < 5 years old having faeces containing egg of worm. The controls were children of < 5 years old having faeces without egg of worm  Sample size was calculated based on the study design: 63 cases and 65 controls.	The same as above
6	The risk factors of neonatal deaths in obstetric hospital	To examine factors of antenatal care, TT immunization of pregnant women, pregnant anemia, low weight baby born, parity and hypothermia associated with neonatal deaths in obstetric hospital in Makasar municipality	Case control study	The population were all neonatal babies The cases were neonatal deaths before 7 days old. The controls were alive babies before 7 days old. No calculation of sample size based on study design:  1 sample and 3 control	The same as above
7	The level of gamma interferon at household contacts with tuberculosis patients	To compare the result of Mantoux test by examining IFN level - $\gamma$ at the household contacts with positive laboratory tuberculosis patients	Cohort study:	Cohort group were the adult of > 15 years old living with the new cases of positive laboratory tuberculosis patients and Comparison group were those living	Because of the distribution of IFN gamma level was abnormal, it was used Man Whitney U

				without the new cases of positive laboratory tuberculosis patients. No calculation of sample based on study design. No calculation based on study design	to test significant different of IFN gamma level between those contact with tuberculosis and those do not contact with tuberculosis
8	The effect of exercise and diet on diet exercise on male pre hypertension	To evaluate the effect of diet and exercise on the decrease of blood pressure, heart rate, blood fat and blood electrolyte	Randomized clinical trial and. cross sectional study. No clarification how to conduct and what is the result of randomization	Population were patients of pre hypertension at PT Kramayudha Ratu Motor, Jakarta Timur. No clarification of sample size and calculation	No clarification on bi and multiple variables analysis

Table 2 shows that 1) In each study number 1, 2, 3, 4,5 and 6, there was the result of multivariate analysis, but in each study number 7 and 8, there was only the result of bivariate analysis; 2) In each study from number 1 to number 8, there was no discussion on quality and accuracy of data, causal relationship, and implication; 3) In each study from number 1 to number 8, the conclusion and recommendation are not based on causal relationship and implication of study; and suggestion is not based on recommendation.

Table 2. The Title of study by objective and methods (type of design, population and sampling)

No	The Title of Article	Result	Discussion			Conclusion and Recommendation/ Suggestion
			Quality and Accuracy of Data	Causal Relationship	Implication	
1	Association between replacement of working time and the worker's working pattern	Multivariate Analysis: replacement of working time, caffeine consumption and the use of sleepy medicine are associated with the worker's working pattern	There is no discussion on quality and accuracy of data.	There is no discussion on causal relationship	There is no discussion on implication of study	Conclusion is and recommendation are not based on causal relationship and implication of study, Suggestion is not based on recommendation
2	The determinants of the elder's food consumption	Multivariate analysis: other diseases, food taste and the number of teeth	The same as above	The same as above	The same as above	The same as above

		are associated with the elder's food consumption				
3	The role of obstetrics and gynecologist	Multivariate analysis: wife's age, wife's education, husband's education and household's economic status, history of bleeding and history of complication are associated with caesarian operation..	The same as above	The same as above	The same as above	The same as above
4	The influence of health care on malnutrition of children of 6 – 24 months old	Multivariate Analysis: Infectious disease, food guidance, the use of health care and family income are associated with malnutrition of children of 6 – 24 months old	The same as above	The same as above	Th same as above	The same as above
5	Cleanness and house sanitation concerning children of < 5 years old suffering from worm diseases	Multivariate analysis: Floor type, existing latrine, defecation habit, hand cleaning after defecation, mother's knowledge are associated with worm diseases	The same as above	The same as above	The same as above	The same as above
6	The risk factors of neonatal deaths in obstetric hospital	Multivariate analysis: TT immunization, pregnant anemia, birth weight, parity, and asphyxia are the risk factors of neonatal deaths	The same as above	The same as above	The same as above	The same as above
7	The level of gamma interferon at household contacts with tuberculosis patients	Bi variable analysis: The level of interferon gamma is higher at those expose to positive laboratory tuberculosis than	The same as above	The same as above	The same as above	The same as above

		those do not expose to positive laboratory tuberculosis.				
8	The effect of exercise and diet on diet exercise on male pre hypertension	No clarification about the success of randomization; otherwise, multi variable analysis should be conducted  Bi variable analysis: fast walking and diet cause the decrease systolic and diastolic blood pressure and Na and increase K in blood.	The same as above	The same as above	The same as above	The same as above

## 4. DISCUSSION

### 4.1. Intervention Study with Causal Relationship: Randomized Clinical Trial

The result of study number 8 using *the type study design randomized clinical trial* should be *exercise by fast walking and diet decrease pre hypertension*; but because of no attempt to test the result of randomization, and no information concerning calculation of sample size, we are not sure the efficacy of the exercise and diet, and no information about random error; as a consequence it creates the weakness of data validity. In addition, no discussion concerning quality and accuracy data, causal relationship and implication of study; as a consequence, based on the eight level of IQF, we are not sure the competency of the writer to formulate conclusion, recommendation and suggestion issued by this study.

### 4.2 Observational Study with Causal Relationship: Cohort Study

The result of study number 7 using the type of design **cohort study** should be *the level of gamma interferon influence the occurrence of tuberculosis infection*; substantively, the level of gamma interferon is not the cause, but the indicator of tuberculosis infection. Methodically, there is no calculation of sample size; as a consequence we do not know the level of random error, so it is the weakness of data validity. In addition, there is no discussion on the quality and accuracy of data, causal relationship, and implication of study; as a consequence, based on the eight level of IQF, we are not sure the competency of the writer to formulate conclusion, recommendation and suggestion issued by this study.

### 4.3. Observational Study without Causal Relationship: Case Control Study

The objective of study number 4 namely to evaluate *the risk factors of malnutrition of children of 6 – 24 months old*, is not relevant with *the type of study design case control study*, because it does not produce causal relationship directly. The objective of study number 5 and 6 is relevant with *the type of study design case control study*. But the studies number 4, 5 and 6 do not explain calculation of sample size and sampling procedure; as a consequence the weakness of data validity cannot be avoided. Since the three (4, 5 and 6) studies do not produce causal relationship directly, the writer should conduct discussion causal relationship by using Hill criteria. In fact, there is no discussion on quality and accuracy of data, causal relationship (Hill criteria) and implication of study; as a consequence, based on the 8<sup>th</sup> level of IQF, we are not sure the competency of the writer to formulate conclusion, recommendation and suggestion issued by the three studies.

### 4.4. Cross Sectional Study does not Produce Causal Relationship:

The objective of study number 3 namely to evaluate *the role of obstetric and gynecologist*, is not relevant

with *the type of study design cross sectional study*, because it does not produce causal relationship. The objective of study number 1 and 2 is relevant with *the type of study design cross sectional study*. But the studies number 1, 2 and 3 do not explain calculation of sample size and sampling procedure; as a consequence the weakness of data validity cannot be avoided. Since the three (1, 2 and 3) studies do not produce causal relationship directly, the writer should conduct discussion on causal relationship by using Hill criteria. In fact, there is no discussion on quality and accuracy of data, causal relationship (Hill criteria) and implication of study; as a consequence, based on the 8th level of IQF, we are not sure the competency of the writer to formulate recommendation, and suggestion issued by the three studies. .

## 5. CONCLUSION

Based on the epidemiological review of the 8 articles presented in Scientific Journal, IQF has not been applied because as we can see there are serious problems in the application of epidemiological methods concerning discussion on quality and accuracy of data, causal relationship and implication of study; as a result, social significance of conclusion, recommendation and suggestion issued by the studies presented in the 8 articles is low in the field of public health. IQF itself has to be socialized among researchers. Hopefully, the readers especially publishers and researchers to be stimulated how they contribute in the development of science in their field through research using interdiscipline and multidiscipline approach to produce innovative and tested work, as stated in the IQF.

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