THE APPLICATION OF INDONESIAN QUALIFICATION FRAMEWORK IN SEVERAL STUDIES ON OCCUPATIONAL HEALTH

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Abstract— Indonesian Qualification Framework (IQF) is Kerangka Kualifikasi Nasional Indonesia (KKNI) consisting 9 levels of competence. The 8th and 9th levels of IQF are equivalent to the competence of Master and Doctoral degree. Their competences are 1) to develop scientific knowledge producing innovative work for Master degree, and original or creative work for Doctoral degree; and 2) to solve the problem of science through inter or multi discipline for Master degree, and inter, multi and trans discipline for Doctoral degree.` The objective of this scientific paper is to identify how far the writers conduct the application of IQF by reviewing the result of several studies on occupational health published in Scientific Journal describe the competence of researchers in the application of the 8th and/or 9th levels of IQF.

To fulfil the competence, the researcher should conduct systematic study in term of continuation of thinking starting from title, objective, methods (type of design, population and sample, and data analysis), results, discussion on quality and accuracy of data, causal relationship, implication, conclusion of study followed by recommendation and suggestion. The implication uses the result of causal relationship directed to conclusion and recommendation. Conclusion contains development of knowledge, while recommendation contains how to solve the finding problems. Based on the recommendation, suggestion is formulated through inter, multi discipline producing innovative work for Master degree, and through inter, multi and trans discipline producing creative & original work for Doctoral degree.

Seven studies on occupational health published in scientific journal were reviewed, from which the conclusion is as follows: most of design type of study are based on objective of study, but all studies do not calculate sample size based on design type of study and no discussion concerning quality and accuracy of data, causal relationship and implication of study. It means that recommendation and suggestion produced by each of the 7 studies may not describe the competence of researchers in the application of the 8th and 9th level of IQF. Hopefully, the readers are stimulated to attempt how they have competence according to the level 8 or 9 of Indonesian Qualification Framework (IQF).

Keywords— Qualification, Implication of Study, Recommendation, Suggestion, Occupational Health.

I. INTRODUCTION

Indonesian Qualification Frame (IQF) is *Kerangka Kualifikasi Nasional Indonesia* (KKNI), consisting 9 levels.1 The 8th level of IQF is equivalent to Master degree, and the 9th level of IQF is equivalent to Doctoral degree. Those having Master degree, based on the 8th level of IQF, have 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.

Those having Doctoral degree, based on the 9th level of IQF, have 2 out of 3 competences:

- 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 trans-discipline approach.

For those who want to have career as teaching staff or lecturer in university, they need to have qualification as Master or/and Doctoral degree. Then they want to develop their career starting from *assisten ahli* (expertise assistance), *lektor* (lecturer), *lektor kepala* (senior lecturer) and *professor* (the highest), they need to have credit point through publication of their scientific paper in Scientific Journal.

The objective of this scientific paper is to identify how far the writer conducts the application of IQF by reviewing the results of several studies on occupational health published in Scientific Journal.

II. METHODS

This review concerns with 9 studies on reproductive health titled as follows:

1. Work attitude and muscle-skeletal disorders (M`SD) in laundry worker.[2]
2. Mercury in the illegal gold mining workers.[3]
3. Hearing and balance impairment in tuberculosis patient of first and second category of anti-tuberculosis treatment.[4]
4. Prevalence and risk factors of hearing loss in the Ferry Machine Operator.[5]
5. Work and non-work related as causes of fatigue suffered by heavy equipment operator in Coal Mining Industry.[6]
6. Noise exposure and hypertension among harbor workers.[7]
7. Visual Compact Disk (VCD) and leaflet usage to increase knowledge, attitude, behavior of students in motorcycle accident

prevention.[8]

The review of each study is to assess the application of systematic research conducted in term of Red Line [9] namely continuation of thinking *starting from the title to objective*, followed by methods, results, discussion, and conclusion of study, recommendation and/or suggestion. It means there is continuation or relationship of several aspects between the title and the following chapters.[10]

The chapter of Introduction consists of several sections namely background, formulation of general research problem, general research objective, social significance and scientific significance of study. Formulation of general research problem is based on the background. The content of general research problem in the form of research question is the same as general research objective formulated in the form of statement sentence. Social significance of study is the use of information from achievement of general objective for solution of problem situation, while scientific significance of research is the use of hypothesis proof for *development of scientific knowledge* (Level 8 of IQF), or for *development of new scientific knowledge* (Level 9 of IQF). The researcher thinks consistently starting from background, formulation of general research problem, general objective of study, social and scientific significance of study.[10]

In the chapter of Literature Review, general research problem is modified to be specific research problem after formulation of theoretical framework and conceptual framework. In the chapter of Research Design, specific research problem is modified to be specific research objective followed by the sections of hypothesis, design type of study, population and sample, data collection, and analysis of data.

The section of design type study which is conducted by those studying for Master and Doctoral degree is analytic quantitative research useful to prove hypothesis, or qualitative research useful to generate hypothesis. Both of them is necessary to develop scientific knowledge as one prerequisite for level 8 of IQF, and to develop new scientific knowledge as one prerequisite for level 9 of IQF. The analytic quantitative research design consists of several types of study design namely analytic cross sectional study, case control study, prospective or retrospective cohort studies, before and after with control study, randomized clinical trial, and randomized community trial. *The design type of study has to be relevant with objective of study*.

Population should be defined, from which representative sample is taken through certain procedure after calculation of sample size.[11] 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.[12] If the size of sample is less than what should be, α error and β error become higher, that decrease the validity of the result of study.

The collection of data is excluded from this review, because it is more substantial than methodical. The method of *data analysis consisting analysis of one -variable, analysis of two variables, and analysis of multiple variables* are included in this review. The result of study is actually the result of analysis; the result of analysis of two variables is not conclusive, while the result of multivariate analysis is more conclusive and it is followed by discussion on causal relationship.

The section of *discussion* is concerned with *quality and accuracy of data, causal relationship, and implication of study*. [9.] Quality of data consists of relevancy and validity of data, while accuracy of data consists of relevance, validity and reliability of data.[13] 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 is opposite of systematic error and random error. Systematic error consists of selection, information and confounding bias, while random error consists of α error and β error. External validity means how far the result of study from the sample to be generalized to population where the sample was selected.

The result of analysis of multiple variables may identify the independent variable or exposure which is associated with the dependent variable, and confounding variable which is associated with the independent variable and the dependent variable statistically. Causal relationship between the exposure and the dependent variable is based on Hill criteria.[14] If the types of design used by researcher are *case control study* or analytic *cross sectional study*. Types of study design which indicate causal relationship limitedly are *retrospective cohort study*, and *before and after with control study*. Types of study design directly produce causal relationship are observational study namely *prospective cohort studies* and intervention study namely *randomized clinical trial* and *randomized community trial*.

Implication of study is to use the result of causal relationship to produce section of Conclusion and Recommendation; it means that researcher recommends for intervention on the causal factors. Then based on the recommendation, the suggestions are formulated through *inter-discipline* or multi-discipline approach to develop *scientific knowledge producing innovative work* for the Level 8 of IQF, and through inter, multi and trans-discipline approach to develop *new scientific knowledge producing creative and original work* for the Level 9 of IQF .[10] Thus section of conclusion and recommendation/suggestion has to be based on the chapter of Discussion especially the section of implication of study.

Based on general objective and methods mentioned above, it is formulated specific objectives of this scientific paper literature review as follows:

1. To identify whether objective of study is appropriate or relevant with the title of study
2. To identify each design type of study based on each objective of study concerned
3. To identify definition of population, calculation of sample size based on design type of study and sampling procedure for each study
4. To identify analysis (one variable, two variables and multivariate) conducted in each study
5. To identify discussion (quality and accuracy data, causal relationship and implication of study) conducted in each study.

III. RESULTS

Results of this scientific paper are to present achievement of the 5 (five) specific objectives, as follows:

1. The objective of study number 2, 3, 4 and 5 are not appropriate, and the objective of study number 1, 6 and 7 are appropriate based on the title of study.
2. The design type of study number 3 and 4 are not based on the objective of study. The design type of study number 1, 2, 5, 6 and 7 are based on the objective of study.
3. The study number 2, 3 and 7 do not show definition of *population*, and all of studies do not show calculation of sample size based on the design type study, so the researchers do not know whether the sample size smaller than it should be. Five out of 7 studies do not conduct simple or systematic random sampling, so there will be no representative sample in the study.
4. The study number 5 only conducts analysis of one variable, the study number 1 and 3 conduct analysis of 2 variables. The study number 2, 4 and 6 conduct analysis of multi variables, which is important for discussion on causal relationship. The study number 7 conducts analysis of two variables
5. All studies do not show the discussion concerning quality and accuracy data, causal relationship and implication of study. So the researchers may not produce Recommendation and Suggestion as expected according to Indonesian Qualification Framework (IQF).

IV. DISCUSSION

This review finds 6 studies using the design types of analytic cross sectional study and 1 study using the design type of quasi experimental study. Among the 6 analytic cross sectional studies, the objective of study number 2, 3, 4 and 5 are inappropriate, and the study number 1 and 6 are appropriate. The followings are the discussion on the study number 3 representing inappropriate studies, the study number 6 representing appropriate study, and the study number 7 using the design type of quasi experimental study.

Discussion on the study number 3

In the study number 3: 1) the design type of study is not relevant with the objective of study which indicates causal relationship; 2) there is no statement on population and no calculation of sample size based on design type of study namely analytic cross sectional study; as a consequence, the researcher does not know whether the sample size is smaller than it should be, α error and β error become higher that decrease validity of data; in this case the researcher may not find the association between the category (I and II) of TB treatment and hearing loss and balance impairment although there is causal relationship; 3) Since there is procedure of purposive sampling, the researcher cannot have representative sample, so there is no generalization of the result of sample study to the population; 4) this study only uses analysis of two variables, which cannot be continued to the discussion on causal relationship based on Hill criteria; as a consequence, the researcher may not continue the discussion on implication study which produce recommendation for development of science and solving hearing loss and balance impairment.; it means that the researcher has no opportunity to use inter, multi and trans-discipline approach to formulate suggestion as innovative work in occupational health, as a competence expected according to the 8^{th} and 9^{th} level of IQF.

Discussion on the study number 6

In the study number 6: 1) the design type of study namely analytic cross sectional study is relevant with the objective of study; 2) Population of study is all harbor workers, and the procedure is simple random sampling, but no calculation of sample size based on the design type of analytical cross sectional study; as a consequence, the result of study from the sample can be generalized to all harbor workers, but the researcher does not know whether the sample size is smaller than it should be, α error and β error may be higher that decrease validity of data; in this case the researcher may not find the association between noise and hypertension although there is causal relationship; 3) this study uses analysis of 1 variable, analysis of 2 variables and multiple logistic regression analysis, but the researcher does not show the result of multiple logistic analysis continued to the discussion on causal relationship; 4) This study does not discuss causal relationship and implication of study; as a consequence, this study may not produce recommendation for development of science and solving hypertension suffered by the harbor workers; it means that the researcher has no opportunity to use inter, multi and trans-discipline approach especially occupational health to formulate suggestion as innovative work, as a competence expected according to the 8^{th} and 9^{th} level of IQF.

Discussion on the study number 7

In the study number 7: 1) the design type of quasi experimental study number 7 is relevant with the objective of study namely to assess the effectiveness of visual compact disk (VCD) and leaflet to increase knowledge, attitude and behavior of students…… 2) this study does not show definition of population, procedure of random sampling and calculation of sample size based on the design type of quasi experimental design; as a consequence, the researcher may not generalize the result of study in the sample to certain population, and the researcher does not know whether the sample size is smaller than it should be, α error and β error becomes higher that decrease validity of data. In this case the researcher may find no association between each certain independent variable and the dependent variable namely knowledge, attitude and behavior……. 3) Using analysis of two variables, this study finds the significant association between VCD and leaflet with the knowledge, but no significant association with attitude and behavior of students. The weakness of this quasi experiment: there is no test of null hypothesis between the proportion of category of each characteristic or other independent variables between intervention group and control group; as a consequence, this study may not conclude causal relationship between VCD and knowledge of students; 4) This study does not discuss causal relationship and implication of study; as a consequence, this study may not produce recommendation for development of science and increase knowledge of students; it means that the researcher has no opportunity to use inter, multi and trans-discipline approach especially occupational health to formulate suggestion as innovative work, as a competence expected according to the 8^{th} and 9^{th} level of IQF.

CONCLUSION

Based on the review of 7 studies presented in Scientific Journal, the conclusions are as follows: 1) Most of the design type of study based on the objective of study; 2)Most of studies do not define population and there is no calculation of sample size based on design types of study; 3) some analytic cross sectional studies do not use multivariate analysis; 4) All studies do not discuss quality & accuracy of data, causal relationship, and implication of study. As a consequence, all studies may not produce conclusion, recommendation and suggestion on occupational health as expected according to the 8th and 9th level of IQF.

SUGGESTION

Based on conclusion mentioned above, it is suggested so that the readers who want their manuscript to be published in scientific journal pay attention to the Red Line namely continuation of thinking from the title of study to the following chapters. As a consequence, the readers will be successful to formulate recommendation for developing (new) scientific knowledge and developing suggestion producing innovative, creative, or original work as expected according to relevant IQF.

REFERENCES

[1] Direktorat Jenderal Pendidikan Tinggi. (2011). Kerangka Nasional Indonesia (KKNI), Kajian tentang Implikasi dan Strategi Implementasi KKNI, IQF Nasional

[2] Ulfah U, Harwanti S, Nurcahyo PJ. 2014. Work attitude and muscle-skeleton disordersrisk in Laundry Worker, Jurnal Kesehatan Masyarakat Nasional, Volume 8, No. 7 pp 313-318

[3] Sumantri A, Laelasari E, Junita NR and Nasrudin.2014. Mercury in the Illegal Gold Mining Workers, Jurnal Kesehatan Masyarakat Nasional, Volume 8, No. 8, pp 398-403

[4] Adriztina I, Adnan A, Haryuna SH, Siagian P, Sarumpaet S.2014. Hearing and balanced impairment in Tuberculosis Patient of first and second category anti-tuberculosis treatment, Jurnal Kesehatan Masyarakat Nasional Volume 8, No. 8 pp 430-436

[5] Sumadi J, Andriani S, Subhi M, Suprianto D, Handayani WD, Chodir A, Noviarmi FSI, and Indahwati L. 2013. Prevalence and risk factors of hearing loss suffered by the Ferry Machine Operators, Jurnal Kesehatan Masyarakat Nasional Volume 7 No. 12 pp 545-550

[6] Susilowati IH, Syaaf RZ, Satrya Ch, Hendra, Baiduri. 2013. Work and not work related as causes fatigue suffered by heavy equipment operator in coal mining industry, Jurnal Kesehatan Masyarakat Nasional Volume 8 No. 2 pp 91-96

[7] Harianto E and Pratomo H. 2013. Noise exposure and hypertension among harbor worker, Jurnal Kesehatan Masyarakat Nasional Volume 8 No. 5, pp 215-220

[8] Notosiswoyo M. 2014. Visual compact disk and leaflet usage to increase knowledge, attitude and behavior of students in motorcycle accident prevention, Jurnal Kesehatan Masyarakat Nasional, Volume 8, No. 8 pp 373-379

[9] Lapau B. (2015). *Metode penelitian kebidanan, panduan penulisan protokol dan hasil penelitian*, Jakarta: Yayasan Pustaka Obor Indonesia

[10] Lapau B. (2013). *Metode penelitian kesehatan, metode ilmiah penulisan skripsi, tesis dan disertasi*, Jakarta: Yayasan Pustaka Obor Indonesia

[11] Fisher A et al. (1983). *Hanbook for family planning operations research design*, USA: Population Council

[12] World Health Organization, (1986). *Sample size determination, a user's manual*, Epidemiological and Statistical Methodology Unit. Geneva: WHO

[13] Lapau B. (2012). *Prinsip dan metode epidemiologi*. Jakarta: Balai Penerbit FKUI.

[14] Beaglohole et al (1993). *Basic Epidemiology*, Geneva: World Health Organization.

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