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Socialization Android-Based Electronic Screening Test Epidemiology (E-Steco 19) In Indonesia and Timor Leste

Frieda Ani Noor[1], Aris Prastyoningsih[2], Maria Wisnu Kanita[3], Oliva Virvizat P[4], Ernawati[5], Wahyuningsih Safitri[6], Retnaning Tyas Rahayu[7]

[1-7] Kusuma Husada University

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Corresponding Author:
Frieda Ani Noor

ABSTRACT

Introduction: A statement of being in good health is one of the prerequisites as a lecturer or employee at Kusuma Husada University, in which an employee must be declared in good health to prove that an employee is healthy and ready to work, without any serious unhealthy obstacles. Health checks by computerized epidemiology screening test will speed up the process and assist the doctor The development of health applications using the epidemiological screening test method for lecturers and Studends, at the Kusuma Husada University Health Clinic Indonesia Health screening tests quick and efficient in accordance with existing data, and give the result of employee health data directly. The purpose of this study is to make it easier to detect the health status of Kusuma Husada University lecturers and Studends, which is used for one of the prerequisites for a work contract with a health application using an epidemiological screening test method.

Methods: Data collection was done by qualitative method and carried out from February to August 2022. lecturers and Studends data retrieval is done using a digital questionnaire (online). Sample of this research is a studends, and employee at Kusuma Husada University Indonesia, the results is used to make applications (e-Steco).

Results: E-Steco 19 is an Android-based application that is used to detect a person's health using the screening test method. Data will be stored using Google Sheet and Google App Script. Thus, the data that has been collected from users who fill out a list of questions in the application can be downloaded and processed according to the needs. Data can be downloaded via the link. The e-Steco result can be processed in such a way that the data can be used as material for decision making. E-Steco 19 consists of 14 questions for health screening. Here we show the results of data processing from e-Steco 19 Result in the form of a pie chart.

Results: The e-Steco 19 application has been completed and has also been running a test, so that it can make it easier to detect the health of lecturers and Studends, at Kusuma Husada University Indonesia. This application is still possible to be developed and used in Timor Leste University and Health Clinic.

KEYWORDS: application, health screening, e-Steco.

INTRODUCTION

A. Background

Humans who sometimes look healthy from the physical, are still not necessarily totally healthy. There are conditions where human health may be unsanitary or indicated by certain diseases, but the disease is unknown. Knowing the disease of a human being must check himself with health experts, whether doctors are experts in general diseases in hospitals, clinics or health centers. The results of the medical examination provide information on a person's health, which is generally informed in the form of a health certificate.

Able-bodied information is also one of the prerequisites as an employee of Kusuma Husada University, where an employee must be declared able-bodied to prove that an employee is healthy and ready to work, without any obstacles to severe unhealthy. Medical examinations that cannot be done directly at the kusuma Husada University company premises and require more time for examinations and get health

results. So through this study, the researcher made an application related to health checks.

The discipline of public health sciences with epidemiological methods is presented by last (2001) as the distribution, determinant of health-related circumstances or events in their development and their application to the memory of health problems, while the US Chronic Diseases Commission (1951) in the epidemiological dictionary (A Dictionary of Epidemiology), identification of diseases, defects that have not been recognized by humans by applying examinations or tests that can be applied quickly, is screening or screening. Screening or screening as a health test that sorts or separates people who look healthy to be grouped into groups that may have diseases and groups of people who may be healthy. In testing and medical examinations using screening or screening in the form of questions about the cause of the disease or the medical history of a person or his family. From questions and drawing conclusions that are still manual in nature, either written or question and answer, then in making applications using an expert system, tohealth experts in the application of test screening are adopted into a computerized system so that computers can solve problems as is usually done by experts. The purpose of this study was carried out to make it easier to detect the health of Kusuma Husada University employees which was used for one of the prerequisites for a job contract with a health application using the epidemiological method of screening tests. Based on this, a Health Application Using the Test Screening Method is needed, in order to more easily detect the health of Kusuma Husada University employees.

B. Problem Formulation

Based on the background above, the formulation of the problem in this study is to analyze and design a Health Application Using the Test Screening Method.

C. Purpose

Based on the background above, the objectives in this study are: to make it easier to detect employee health at Kusuma Husada Surakarta University with a Health Application Using the Test Screening Method

D. Benefit

In relation to the purpose of its implementation, the benefits obtained from the implementation of this research include:

1. Availability of Health Application at Kusuma Husada Surakarta University Health Clinic.
2. The availability of employee health data at the Kusuma Husada Surakarta University Health Clinic digitally.

E. Output Targets

Health Application available at The Health Clinic of Kusuma Husada Surakarta University.

LITERATURE REVIEW

A. Application

An application is a subclass of computer software that utilizes the computer's ability directly to perform a task that the user wants (Wikipedia, 2012). The application can also be said to be a translator of commands that computer users run to be forwarded to or processed by hardware. According to Marimin et al. (2011:43) An application is a program that can directly carry out the processes used in the computer by the user. An application is a collection of certain files that contain program code that connects between the user and the computer hardware.

An application often also referred to as software, is a computer program whose instruction content can be changed easily. Applications are generally used to control hardware (which is often referred to as device drivers), perform calculation processes, and interact with other more basic applications (such as operating systems, and programming languages). In general, applications can be divided into 3 levels, namely the application program level (application program for example Microsoft Office), the operating system level (operating system for example Microsoft Windows), and the programming language level (for example PHP).

In terms of the definition of an application is a program that is ready to be used that is made to carry out a function for users of application services and the use of other applications that can be used by a target to be targeted. According to the executive computer dictionary, application has the meaning of solving problems that use one of the application data processing techniques that usually races on a desired or expected competency or expected data processing [11]. Application comes from the word application which means application, application, use. In terms of application is a ready-to-use program designed to carry out a function for another user or application and can be used by the intended target [5].

B. Expert system

An expert system is a system that seeks to adopt human knowledge to a computer, so that computers can solve problems as experts usually do. A good expert system is designed to be able to solve a certain problem by imitating the work of experts. With this expert system,

even ordinary people can solve quite complicated problems that can actually only be solved with the help of experts. For experts, this expert system will also help his activities as a very experienced assistant.

There are several definitions of expert systems, including:

1. According to Durkin: An expert system is a computer program designed to model the problem-solving capabilities of an expert.
2. According to Ignizio: An expert system is a model and procedure related to, in a particular domain, in which the level of expertise can be compared with the expertise of an expert.

According to Giarratano and Riley: An expert system is a computer system that is biased towards matching or imitating the abilities of an expert.

According to Efraim Turban, the basic concepts of the expert system contain: expertise, experts, transfer of expertise, inference, rules and the ability to explain. Expertise is an advantage of mastery of knowledge in a particular field obtained from training, reading or experience. An expert is someone who is able to explain a response, learn new things about the topic of the problem (domain), recast knowledge if deemed necessary, break down rules if needed, and determine whether their expertise is relevant. The transfer of expertise from experts to computers to then be transferred again to other people who are not experts, is the main purpose of the expert system. This process requires 4 activities, namely:

1. Additional knowledge (from experts or other sources).
2. Representation of knowledge (to the computer).
3. Inference of knowledge.
4. Transfer of knowledge to the user

Knowledge stored on a computer is called by the name of the knowledge base. There are 2 types of knowledge, namely: facts and procedures (usually in the form of rules). One of the features that an expert system should have is the ability to reason. If expertise is already stored as a knowledge base and there is already a program available that is able to access the database, then the computer must be programmable to create inferences. This inference process is packaged in the form of an inference motor (inference engine).

C. Advantages of Expert Systems

Broadly speaking, there are many benefits that can be taken with the existence of an expert system, including:

1. Allows ordinary people to be able to do the work of experts.
2. Can do the process repeatedly automatically.
3. Retains the knowledge and expertise of experts.
4. Increase output and productivity.
5. Improving quality.
6. Able to take and preserve the expertise of experts (especially those that include rare skills).
7. Able to operate in a dangerous environment.
8. Have the ability to access knowledge.
9. Have reliability.
10. Increase the flexibility of the computer system.
11. Have the ability to work with incomplete and uncertainty-containing information.
12. As a complementary medium in research.
13. Improve troubleshooting capabilities.
14. Save time in decision making.

D. Weaknesses of the Expert System

Besides having some advantages, the expert system also has

some disadvantages, including:

1. The cost required to make and maintain it is very expensive.
2. It is difficult to develop. This is of course closely related to the availability of experts in their fields.
3. The Expert System is not 100% true value.

E. Epidemiological Methods

Epidemiology is a core discipline of public health sciences. Professor Sally Blakley in an introductory epidemiology lecture at the Tulane School of Public Health and Tropical Medicine, New Orleans, in 1990 called epidemiology "the mother science of public health" (Blakley, 1990). Public health aims to protect, maintain, restore, and improve the health of the population. While epidemiology contributes by describing the distribution of disease in the population, examining exposure to factors that influence or cause differences in the distribution of the disease. Knowledge of the causes of differences in disease distribution is then used to select appropriate intervention strategies to prevent and control diseases in the population, by eliminating, avoiding, or changing those causative factors.

F. Screening (Screening)

Screening/screening is the process of detecting cases/health conditions in healthy populations in certain groups according to the type of disease that will be detected early by increasing awareness of prevention and early diagnosis for groups that are at high risk. In developed countries, generally the screening/screening process is carried out on non-communicable diseases, for example breast cancer which is carried out in at-risk groups such as women born twins, there are family genetics, unmarried women, women who do not breastfeed (red breastfeed) their children and unhealthy

diet and lifestyle patterns, women who use hormonal birth control, women who menstruate first under 12 years and menopause over 55 years. The following describes the definition of screening/screening according to some Epidemiologists.

According to Webb (2005), screening/ screening is a simple test method that is widely used in healthy populations or populations without symptoms of the disease (asymptomatic). Screening/screening is not done to diagnose the presence of a disease, but to separate the population of screening/screening subjects into two groups, namely people who are more at risk of suffering from the disease and people who are less likely to be at risk of certain diseases. Those who may have the disease (that is, those whose result is positive) can undergo further diagnostic examinations and carry out treatment if necessary.

According to the U.S. Chronic Diseases Commission (1951) in the Epidemiological dictionary (A Dictionary of Epidemiology), screening/screening is defined as "the identification of a suspected disease or disability that has not yet been recognized by applying rapidly applicable testing, examination or other procedures. Screening/screening tests sort/separate people who look healthy to be grouped into groups of people who may have the disease and groups of people who may be healthy. A screening/screening test is not intended to be a diagnostic effort. People with positive findings according to the results of screening/screening or suspecting a case should be referred to a doctor for diagnosis and undergo the necessary treatment.

Principles in Screening (Screening) To produce a screening/screening program that is beneficial to the wider community, there must be certain criteria in choosing what diseases to screen/screen. Here are some disease characteristics that must be considered in deciding the screening/screening policy.

1. The type of disease must include a severe type of disease, which is relatively common and is considered a public health problem by the public.
2. Screening/screening must be safe and acceptable to the wider community. In the screening/screening process requires the participation of the community who are considered suitable to undergo the examination. Therefore, screening/screening must be safe and not affect their health.
3. Screening/screening must be accurate and reliable. Accuracy level describes the extent to which the test results correspond to the health/disease measured. Whereas reliability is usually related to the standardization or calibration of testing equipment or the skills and expertise of people interpreting test results.
4. Must understand the natural history of the disease well and believe that by doing screening / screening it will result in a much better health condition.
5. Screening/screening will be very beneficial if done at the right time.
6. Policies, procedures and levels of tests should be determined to determine who should be referred for further examination, diagnosis and action

RESEARCH METHODS

A. Data Collection Methods

To obtain the data needed in the preparation of this study using the following data collection methods:

1. Interview

Conducting questions and answers directly to several general practitioners or nurses and also public health educators for analysis of epdemiological methods of health test screening, as well as interviewing the CV PSDM. Annisa for consultation of existing procedures for analysis to build an application system in this study.

2. Direct Observation or Observation

Directly observe the screening process that has been carried out by the health party in general, which with the epidemiological method of conducting health test screening by conducting a number of questions that already exist in general.

3. Literature Studies

Data collection using books and internet searches as reference material in writing reports and creating systems.

B. Stages of System Creation

In the development of this system, there are several stages that must be carried out. The stages are as follows:

1. Running System Analysis;

a) Measuring the time of the medical test at the Puskesmas or Doctor takes approximately 60-120 minutes

b) The results of the medical test information are made by handwriting which takes 10 – 20 minutes

2. System Needs Analysis

a) The use of a medical test screening application in answering questions takes 10 – 30 minutes

b) The system can calculate directly automatically the calculation of the ideal weight result and body mass index

c) The system can display health test screening questions and accumulate answer results automatically

d) The results of the screening test using the application can be seen immediately after carrying out the test

C. System Design

A good design process is needed for program creation, including in making good applications. Detailed system design, done by: ***Application System Flowchart***

Schematics of the system process sequence flow logically, from the beginning of starting the screening application to the completion of the screening results.

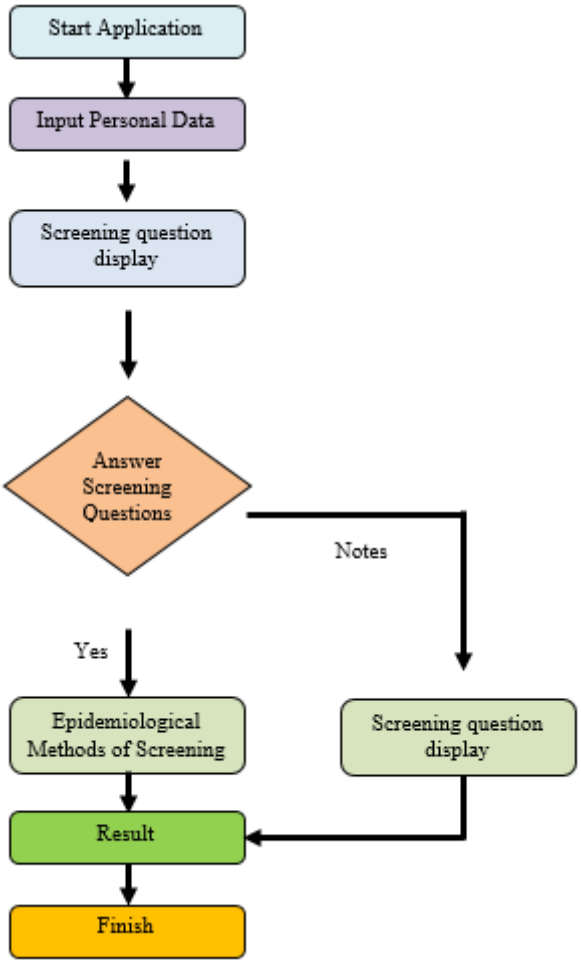


Figure 1. Flowchart Screening Application

COST AND SCHEDULE OF RESEARCH

A. Cost Budget

The justification of the cost budget is written in detail and clearly. While the summary of the cost budget is prepared according to the format with the following components.

THE RESULT OF MAKING THE APPLICATION

A. e-Steco 19 (Electronic Epidemiological Test Screening)

E-Steco 19 is an Android-based application used to detect a person's health using the test screening method. This application is designed using several supporting software, including:

1. IDE Android Studio

Android Studio is one of the Integrated Development Environments (IDE) that can be used to develop Android-based applications based on IntelliJ IDEA.

2. Flutter

Flutter is one of the technologies owned by Google that is useful for developing cross-platform applications (Android, iOS and web) in one code.

3. Dart Programming Language

Dart is one of the programming languages created by Google and is the main programming language in using Flutter.

4. Google Apps Script

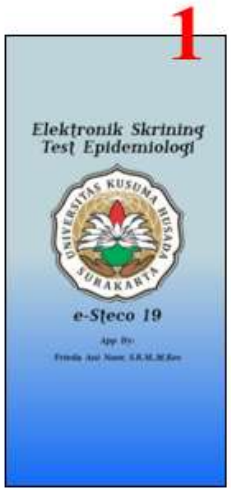
Google Apps Script is an application developed by Google using the JavaScript language. This application is able to create a lightweight *cloud-based* application.

5. **Google Sheets**

Google Sheets is a software developed by Google with the aim of allowing users to create tables, simple calculations and data processing. Google Sheets is a web-based software that allows users to collaborate in creating the desired data.

The data on the e-Steco 19 application will be stored using Google Sheets and Google App Script. Thus, the data that has been collected from users who fill out the list of questions on the application can be downloaded and processed according to needs. The data can be downloaded via the following link: **https://docs.google.com/spreadsheets/d/1DA3p5B6BR2sCxhc5GVT_Iz6_cshn3bsLkbUSZs4eJ3A/edit#gid=0**

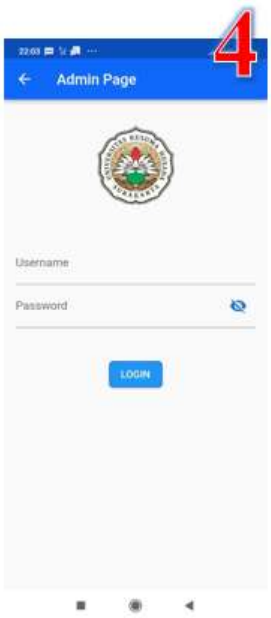
B. Instructions for Use of the e-Steco 19 App



After the process of installing the e-Steco 19 Application is complete, then the initial halawan will appear as shown above

1. Fill in your Name and Address correctly according to the applicable Identity Card
2. Next, click on the button..

3. The content of the questions displayed on the application page according to the current conditions
4. When finished, click on the **"SUBMIT"** Button



- After selecting Admin Login in process number 2 a page will appear as shown on the left
- Fill in Username and Password
- Then click Login

- After logging in, a map will appear along with marker points for approximate student positions
- Click on the existing marker point, then the student's information will appear

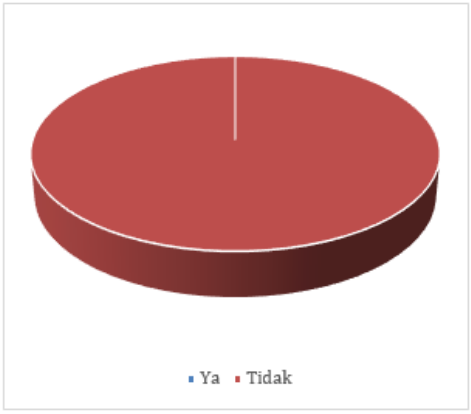
C. e-Steco 19 running test results

The trial of running the e-Steco 19 application was carried out at Bachelor of Health Administration, Kusuma Husada Surakarta University which was attended by all students and students of Bachelor of Health Administration. Here is the capture of the output results of the e-Steco 19 application.

Draw 1
Screenshot e-Steco Result

The e-Steco Result can be processed in such a way that the resulting data can be used as material for decision making. This e-Steco 19 consists of 14 questions for health screening. Here we show the results of the processing data from the e-Steco 19 Result in the form of a pie diagram.

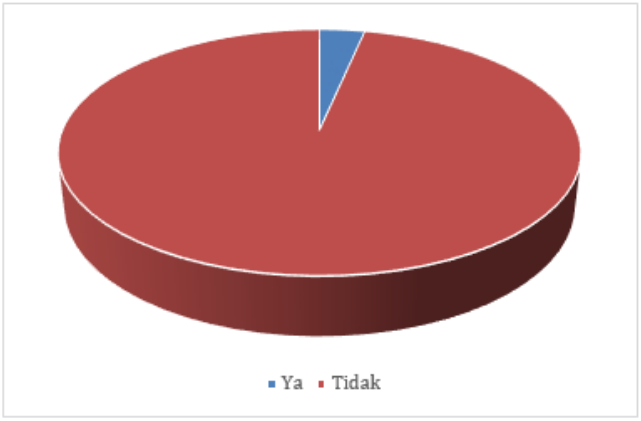
Question_1 is "*Are you having a fever ≥ 38°C ?* "



Draw 2
Pertanyaan_1

From the picture above, it is known that 100 percent of respondents answered no.

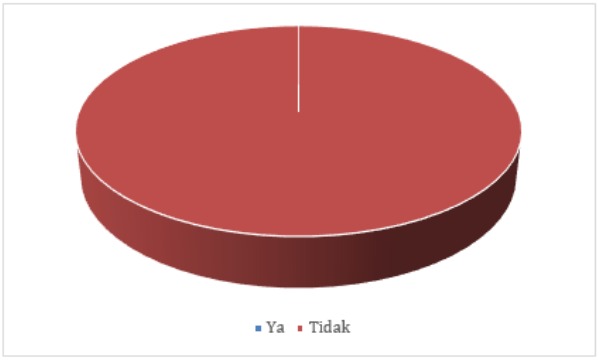
Question _2 is "*Are you having a cough?* "



Draw 3
Pertanyaan_2

From the picture above, it can be seen that 97% of respondents answered no, only 3% of respondents stated that they were coughing.

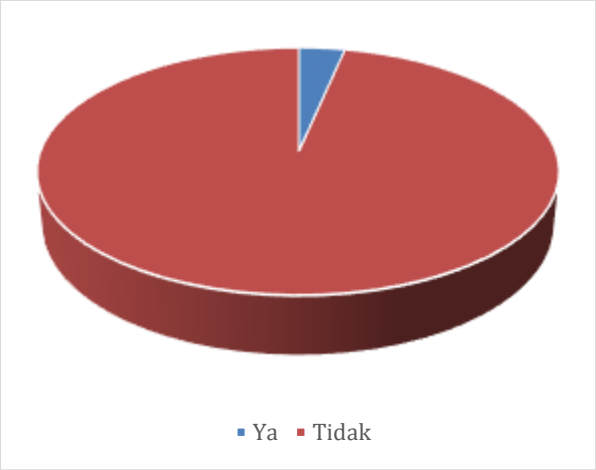
Question _3 is "*Are you having a cold?* "



Draw 4
Question_3

From the picture above, it can be seen that 100 % of respondents answered no.

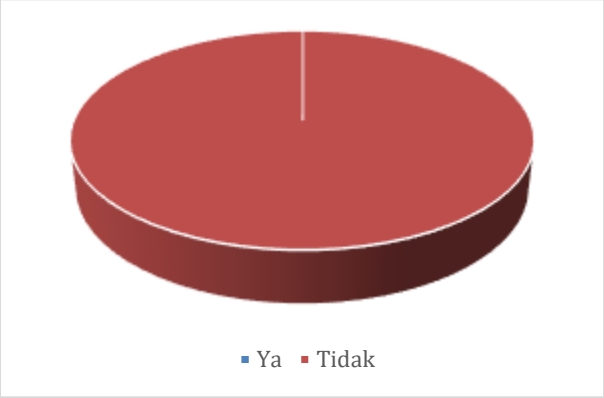
Question _4 is "*Are you having a sore throat?* "



Draw 5
Question_4

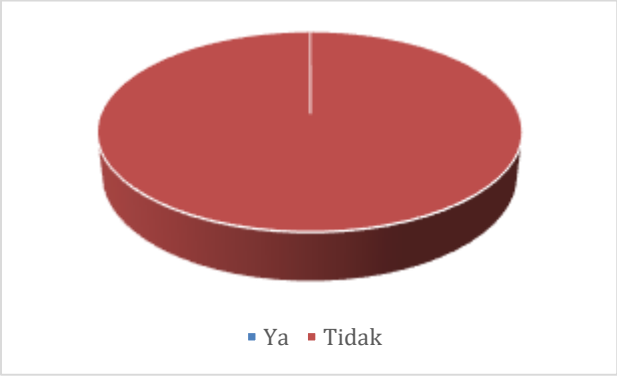
From the picture above, it can be seen that 97% of respondents answered no, only 3% of respondents stated that they had a sore throat.

Question _5 is "*Are you experiencing shortness of breath?* "



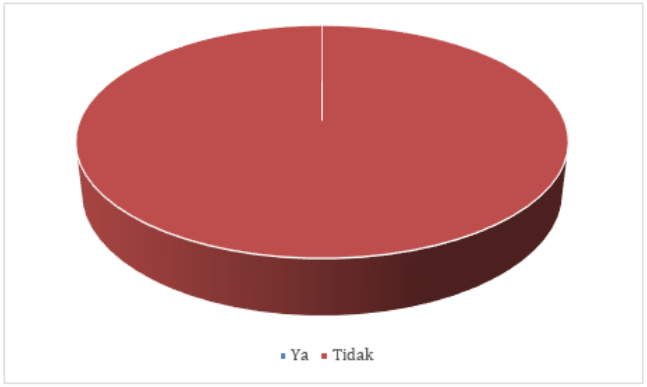
Draw 6
Question_5

From the picture above, it can be seen that 100% of respondents answered no.
Question _6 is "*Are you experiencing nausea?* "



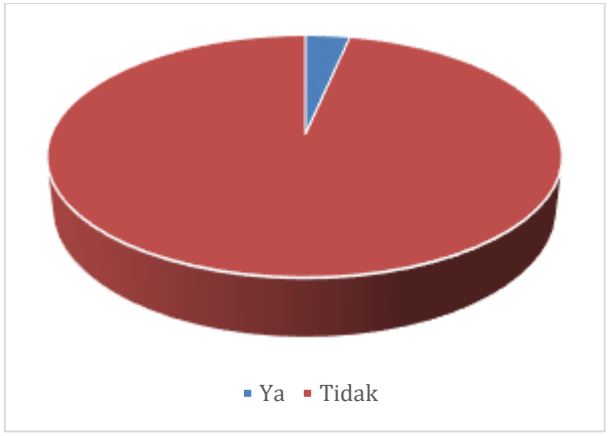
Draw 7
Question_6

From the picture above , it can be seen that 100% of respondents answered no.
Question _7 is "*Are you having Diarrhea?*



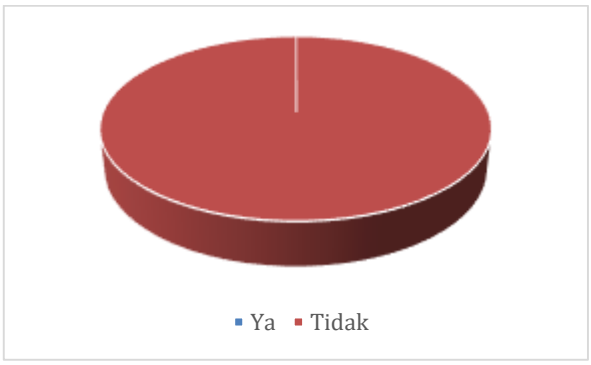
Draw 8
Question_7

From the picture above, it can be seen that 100% of respondents answered no.
Question _8 is "*In* the *last 14 days do you have a travel history or live in a country/city that reports local transmission?* "



Draw 9
Pertanyaan_8

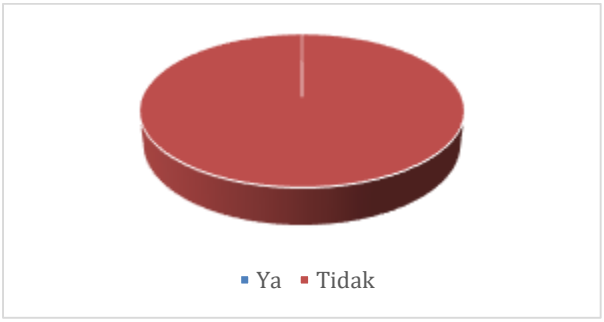
From the picture above , it can be seen that 97% of respondents answered no, only 3% of respondents stated that they had traveled in the last 14 days, namely from the city of Jakarta.
Question _9 is "*In the last 14 days, has there been any contact with a confirmed case of Covid-19?* "



Draw 10
Question_9

From the picture above, it can be seen that 100% of respondents answered no.

The question _10 is "*In the last 14 days, has there been any contact with people who have respiratory tract pain (such as fever, cough, shortness of breath)?* "



Draw 11
Question_10

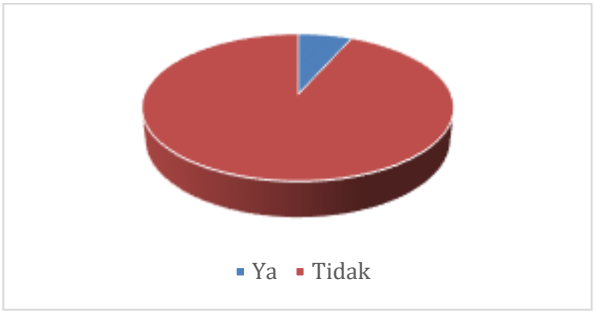
From the picture above, it can be seen that 100% of respondents answered no.

Question _11 is "*Do any family members of one house have signs and symptoms? Such as Heat ≥ 38 °C, Cough, Runny Nose, Sore Throat, Shortness of Breath, Diarrhea, Nausea, Vomiting?* "

Draw 12
Pertanyaan_11

From the picture above, it can be seen that 97% of respondents answered no, only 3% of respondents stated that there were family members who were sick with coughs and colds.

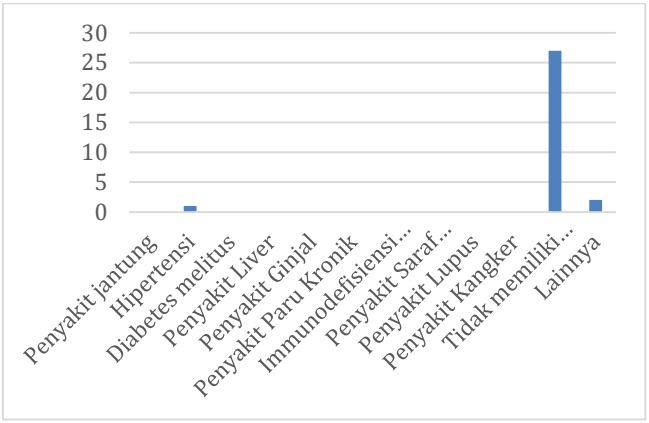
Question _12 is "*In the last 7 days, have you ever had a Covid 19 test independently or through a doctor's examination* "



Draw 13
Pertanyaan_12

From the picture above, it can be seen that 95% of respondents answered no, only 5% of respondents stated that they did a covid19 test, namely with Rapid Abtigen with a negative result.

Question _13 is "*Have you ever been or are you currently having the following disease?* "

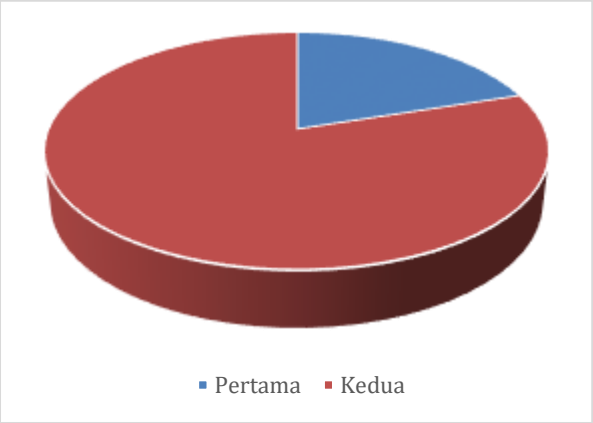


Draw 14
Pertanyaan_13

From the picture above, it can be seen that most respondents have no history of disease, only 5% of respondents stated that they have a history of disease, namely hypertension and a history of other diseases (Disease hull).

Question _14 is "*Are you vaccinated against COVID-19?* "

Draw 15
Question_14



Draw 16.
How many vaccines?

From Figure 15 above, it can be seen that 100% of respondents answered that they had been vaccinated, and 80% had the second vaccine, 20% were still the first vaccine.

CONCLUSION

1. The e-Stico 19 application has been completed and has also been running tests, so that it can make it easier to detect the health of employees at Kusuma Husada Surakarta University.
2. This application is still possible to be developed more lanjut,

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