

SCIENCE CONCEPT IN KEROKAN

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Article History: Received on 15th February 2019, Revised on 12th April 2019, Published on 30th April 2019

Abstract

Purpose: The aim of the study was to describe the scientific concepts of scraping (kerokan). The first step in this study was literature reviewed from various sources.

Methodology: This type of research is qualitative research through the preparation phase, data collection, and data analysis. Data were collected by conducting interviews in the Javanese community.

Results: The process of scraping there was a scientific concept, which was reflected in the concept of motion that generates heat and then opens the pores of the body resulting in better metabolism. Widening which was marked by enlargement of the vascular diameter and also by the migration of white blood cells, the immune agents that were deceived because they thought the body had wounds. The function of blood cells is to attack the viruses and bacteria that may exist, so the attacker can be eradicated.

Implications: Therefore, Scraping also triggers cardiovascular reactions. Body temperature rises slightly, about 0.5 to 2 degrees Celsius. Increasing the temperature causes a faster chemical reaction that occurs in cardiovascular. This research was expected to open the public's knowledge of doubts against scraping (kerokan)

Keywords: Science concept, Java society, Kerokan, viruses and bacteria, cardiovascular reactions

INTRODUCTION

The knowledge owned by a person will determine an action that will do when faced with a problem, whether in the field of education, economics, social culture, and health. For example, in determining which majors will be taken when in higher education, a prospective student with extensive knowledge and insight will consider logically on appropriate scientific interests and opportunities to get a job after completing it. A knowledgeable village head will set appropriate policies when faced with problems in his or her community. Likewise, a citizen must have extensive knowledge to deal with problems in everyday life. How to manage the waste that is produced every day, how to keep the plants and animals, and what to do when he is experiencing health problems, such as colds or other complaints (Ameen et al., 2018).

In the wind, according to Javanese society is a condition when the wind coming from outside into the human body, causing the body to become uncomfortable, the body becomes cold, body aches, headache, and nausea (Triatnawati, 2010). Based on interviews with some indigenous Javanese people, the cold describes the symptoms of a body with hot body signs, abdominal bloating, nausea, vomiting, frequent belching and exhaust, body fever, and dizziness. This symptom comes after people do things like bathing too long, consuming too much ice, rain, eating late, and eating wrong.

From the medical perspective, the colds only as a term that describe the symptoms of flu, colds, or a cough suffered by the public. In general, these symptoms are experienced during the incubation period of the flu. So the colds only considered as the flu (common cold) (Gribig, nd). mitos, folklore, makam Ki Ageng Gribig). In the media, a disease is a condition of abnormalities of a cell body tissue or a human body organ (Kalatskaya and Drozdikova-Zaripova, 2016)

Caused by some microorganism disease agents in the form of viruses, bacteria, and parasites. The Javanese community has the belief and knowledge to know the origin of a disease and its healing, derived from ancestral heritage from generation to generation, and to this day is still found in the community's life.

From a medical point of view, the healing of illness is done by giving medical action accompanied by medication. However, the Javanese community will take other actions to eliminate the symptoms of the disease termed the colds. Based on observations and interviews from 15 respondents from the Javanese community among traders and academics, 9 of them

chose by means of kerokan, with the assumption that kerokan, the body will feel fresher, the pores will open, so the incoming wind can come out easily. Kerokan can remove the chemicals substance in the body. They feel that after bending, the body felt light and relieved, the appetite increases, does not feel dizzy, the pain is gone, can waste the wind, can burp, and the body felt fresh again. Kerokan is used as the first priority in eliminating the colds.

In line with the results of the study which states that disruption of colds in the Java community is usually overcome by kerokan or with traditional ingredients (Tamtomo, 2008a). On the other hand, there are respondents who choose how to massage and directly take medication to eliminate colds. One of them assumed that scraping was a mistake, and that was only in Javanese tradition, and tended to be a suggestion.

The majority of Javanese people use this method of scraping, so the general public thinks that kerokan is a Javanese cultural tradition. For the Javanese, kerokan is an effective alternative treatment rather than by taking drugs (Indri and Mukono, nd).

There are many assumptions from Indonesian people about kerokan. Kerokan is cheap and efficacious therapy, kerokan as a complementary therapy and alternative therapy, and kerokan is an addiction therapy (Iswidayati, 2007; Metsämuuronen, 2018). Kerokan is not only known among the Javanese community, but has spread to other areas, and the majority of Southeast Asian societies believe in the effects of kerok healing. Kerokan not only found in Indonesia but also in Indochina, scattered in several regions in different terms, among them Vietnam, calling it Cao Gio, China calls it Sha Cave, Laos calls it Khoud Lam, and Cambodia calls it Kos Kyal (Suryani and Sianturi, 2013). In addition to using coins (coins), using special tools made of plastic scrap, bone, ceramics, jade, pieces of ginger, and pieces of onion. The tools should be dull so as not to injure the skin. Coins and other aids are held between the thumb and forefinger in an oblique position. Doing a bending should be slow and the rhythm constant (same).

Data indicating that 60% of respondents prefer scrap to eliminate disease and 6.67% consider it a mistake and suggestion is a stumbling block that requires a scientific explanation, which in turn opens the discourse for the Javanese community about kerokan. This study aims to describe scientific concepts of science contained in kerokan.

EXPERIMENTAL DETAILS

This type of research is qualitative research through the preparation phase, data collection, and data analysis.

Preparation

Conducted a review of the literature on scraps and science books related to physics, chemistry, and biology in the library and also through the internet. The literature review was conducted in the Library of Yogyakarta State University and Gajah Mada University Yogyakarta.

Data Collection

The data collection begins by pre-surveying the Javanese people in the area of Yogyakarta and its surroundings with interview techniques on kerokan. Interview questions include actions taken when feeling unwell / catching a cold, how much people's confidence in traditional treatment of kerokan, kerokan become a treatment priority compared to other treatment, and effects after kerokan.

Data Analysis

Data analysis is done qualitatively by delivering pre-survey results and literature review results.

RESULTS AND DISCUSSION

The concept of science

In this article, the discussion of the concept of science is focused on the aspects of natural science (natural science).

Natural Science is a group of knowledge that has a special feature, which is studying factual phenomena factual, whether in the form of reality or events and causality. Natural science is a science that was originally acquired and developed based on experiments (inductive). The branches of science in this Natural science family are Biology, Physics, Chemistry, Astronomy, and Geology. Natural science study objects cover the concept of science, processes, scientific attitudes, values, natural science applications in everyday life, and creativity (Mulyana, 2009). Natural Science consists of three words of science, knowledge, and nature. Science is a scientifically acquired knowledge. Science has a rational and objective nature.

Rational means to be reasonable, logical, or acceptable to common sense. While objective means according to reality or observation.

(Paul, 1991) The concept is an abstraction of an event, object, or phenomenon that generally has properties or attributes. For example, a fish has in itself certain characteristics that distinguish it from reptiles, and mammals. Biology studies about the constituent elements of living things starting from the smallest units (ie, cells) to the complex. Concepts such as enzymes, grasses, and insects, each have a common characteristic that can distinguish between the three. Chemistry is a branch of science that deals with the composition, structure, and transformation of matter with legal laws relating to that transformation. Chemistry is a science gained and developed based on experiments related to the composition, structure, properties, transformation, dynamics, and energy energetic. Concepts in chemistry, for example, elements, molecules, mixtures, acids, bases, and isotopes. Physics deals with matter and energy, with laws governing particle and wave motion, interparticle interactions, and with molecular sifts, atoms and in atomic nuclei, and with larger-scale systems such as gas, liquid, and solid. Characteristic of physics is the existence of the illustration of reality according to aspects that can be observed in sensory, so it can be said that physics refers to physical reality. Physical concepts that can be observed include the concept of waves, energy, motion, and others. In this article, kerokan will be described from aspects of physics, chemistry, and biology.

From the results of the literature study, there is the science concept of natural science from the aspects of physics, chemistry, biology, which are summarized in Table 1 below.

Table 1: The concept of Natural Science in Kerokan

No.	Aspect	Physics	Chemistry	Biology
1.	Rubbing objects to body	The concept of pressure and friction on two objects, which can cause heat	Heat can speed up the reaction (widening blood vessel reaction)	—
2.	Using coins or objects repeatedly	The heat energy will increase	—	—
3.	Coins or objects used should be blunt	The concept of pressure	—	—
4.	The coin used is made of copper	—	Copper is not easy to rust	—
5.	use onion to rub	—	Contain atsiri	Prevent infection
6.	Use wind oil or other materials such as lotions	The concept of friction	—	Prevent infection
7.	The position of a coin or other object used with a slope 45°	The concept of pressure	—	—
8.	The red color of the skin due to scraped	—	—	Capillary vessels occur inflammation
9.	Direction should be one-way, not back and forth	—	—	Hurt the skin
10.	The scraped part of the the body is the neck, chest, and back of the skin due to scraped	—	—	The part that occurs blockage of blood flow

Kerokan can eliminate the colds through the scientific mechanisms as shown in Figure 1.

Figure 1 explains the mechanism of kerokan. Kerokan is the activity of rubbing coins or other objects to the surface of our bodies. When we rub hands on the surface of the body or rub the other dull objects quickly, then the body will feel the heat. With the increase of heat from the body, blood vessels widen, so the process of oxygenation becomes better because the blood circulation becomes smooth.

Smooth blood flow allows the oxygen and nutrients needed by muscle tissue to be available in sufficient quantities. By

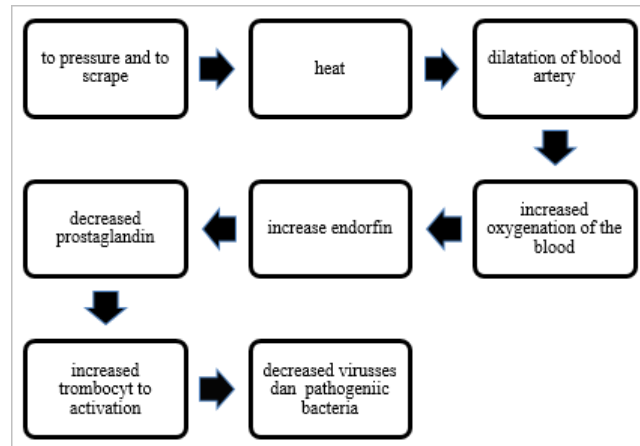


Figure 1: Mechanism of kerokan as a bleeding catch

scraping, substances that cause a sore feeling can be immediately carried through the bloodstream to be removed or neutralized. Kerokan is the application of Einstein's theory with this formula (1) below:

$$E = mc^2$$

With E being the energy generated, m is mass and c is the speed of light. The equation tells us that energy and mass are, effectively, the same thing, and it also tells us how much energy is contained in a given mass, or vice versa. In other words, mass can be thought of as very tightly packed energy. (Elgueta and Quintana, 2018; Syaqui, 2015).

Einstein states that the friction of two bodies causes the emergence of energy, that is heat energy. This is in line with the results of the study kerokan is a model of therapy that utilizes pressure mechanisms to create local inflammatory reactions (Keenan, 1999).

Rubbing coins or other objects repeatedly on the body will make the heat generated from the surface of the body is increasing, or it is said that the heat energy generated greater. With this, the body temperature rises about 0.5 to 2° Celsius. Temperature warning will trigger cardiovascular reactions. (Keenan et al., 1990a,b). In the concept of the speed of chemical reactions, rising temperatures will speed up chemical reactions in the cardiovascular. But not only are the molecules colliding with each other, but they also bump up with a bigger impact, as they move faster. More and more cardiovascular molecules have greater speed because they have enough energy to react. The cardiovascular molecules will move around, and then there will be collisions between molecules one with other molecules (Tamtomo, 2008b)

Coins or other objects used must be dull. In addition to using coins (coins), using special tools made of plastic scrap, bone, ceramics, jade, pieces of ginger, and pieces of onion. The tools should be dull so as not to injure the skin. Coins and other aids are held between the thumb and forefinger in an oblique position. Doing a bending should be slow and the rhythm constant (same In terms of physics, the blunt tool used will affect the amount of pressure applied to the body surface. A dull object has a larger surface area than a non-blunt object, thus, the pressure applied to the body will be smaller when rubbing it in the same fashion. Referring to the pressure equation (2) below:

$$P = \frac{F}{A}$$

where P is the pressure, F is the given force and A is the surface area.

Using copper coins can prevent tetanus from occurring. Copper is a non-corrosive metal (Baroughi and ZAREI, 2013; Lifawati, 2015). If the metal is rubbed on the surface of our body, then there are no side effects caused, such as tetanus.

The Javanese often use red onion to do bending for toddlers. Onion has a volatile oil essential oils to prevent infection in the body because it can reduce the bacteria from our body (Limananti and Triratnawati, 2003). The essential oils produced will be more if, before use, the onion is burned with a flame.

Using wind oil, balm, or other materials such as lotions. Additional ingredients needed for scrubbing are the balm, sequence oil, lotion, cream, or any other kind of oil. These materials are used so that when the skin surface skin does not occur irritation or blisters. In terms of physics, this complementary material serves to make the body warm and avoid the

occurrence of greater friction between coins and body.

Position of a coin or other object used with slope 45° . The position of the coin used when scooping is 45° , so the moment about the skin is not too painful. As in the following picture.

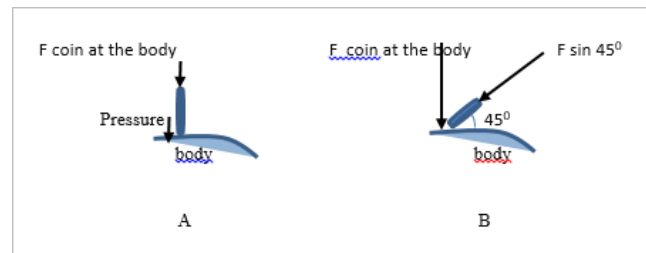


Figure 2: Shows the position of the coin against the body A. The position of the coin is perpendicular to the body B. The position of the coin with the slope 45°

In figure 2A, if the coin in a position perpendicular to the body (forming angle 90°), then the body will receive the pressure of P . But if in figure 2B, the coin with a slope of the 45° the pressure received by the body of $P \times \cos 45^\circ = \frac{1}{2}P \sqrt{2}$ Pressure received by the body. This means scraping the slant coin position 45° , the pain is lighter because the pressure is also smaller.

Red color that occurs on the surface of the body after scraped. On scrapings, in addition to pressure, also followed by repetitive stretching of the skin, and consequently will appear red colored. The red color that occurs can be used as a reference/benchmark rate of a person's windfall. If the more red, the pain will be more severe (Marzuki, nd). 17 This treatment involves the activity of the skin system, muscle, blood vessels, nerves, lymph, immune system, and meridians. When the surface of our body scraped it will happen "in flames". Inflammation aims to neutralize the factors that cause pain and eliminate dead tissue so that the healing process will be faster. Characteristic of this inflammation is the occurrence of red or dark blue colored, due to the network that has been inflamed. This tissue contains a lot of blood due to capillary vessels that were initially empty because it is in a narrow condition, and now has widened (due to scraped) and filled with blood. Kerokan is an effort to increase body temperature and energy on the part of the scrapped. The blood vessels that initially bud will begin to expand, so the blood flows back smoothly.

Kerokan makes the outer skin will peel. The results of blood tests for those performing kerokan therapy showed an increase in endorphins. Increased endorphins make them more comfortable, the disappearance of pain, feeling more energized and more refreshed. (Hatijah et al., ND). When the surface of the body is scraped, there will be inflamed. The substance that becomes anti-inflammation media will issue a substance called "cytokinin". Cytokines are a cell capable of boosting immunity. (Kristanti, 2014) Cytokines have the property of triggering the release of prostaglandins, which can cause contractions of the uterus. Thus, pregnant women are not allowed to do kerokan, because it causes an early contraction due to prostaglandin substances produced. However, the Javanese people have made a myth that pregnant women should not do buckling, because later on the child who will be born will have the same skin and face with a pattern of kerokan. (dan and Angkasawati, 2013; Fathi and Dastoori, 2014) One of the myths and restrictions on kerokan for pregnant women who have long developed by the Javanese community actually has a scientific reason based on science concepts.

The direction should be one-way, not back and forth. Dirt direction is not recommended back and forth, this is because if the swab did back and forth it will hurt the skin.

Body parts are scraped is the neck, chest, and back. with the pattern of kerokan as in Table 2 below.

Table 2: Body parts are scraped

Parts of body	Scaling pattern
Back	Swiped on the left and right side of the spine from top to bottom, and then sideways from the center to edge
Neck	Scratch on the front and back of the neck, from top to bottom
Chest	Scratch from the center of the chest (center) to the edge

Part of the neck is the position of blood flow in the capillary vessels many have accumulated. The blood from the heart is circulated throughout the body continuously. When rising on the upper body, ie the neck, this flow will experience a slight distortion of direction. With a slow flow rate and flow position bend, then on the neck, there will be blood accumulation. The scaling pattern on the neck is described as seen in Figure 3.



Figure 3: The pattern of kerokan at the neck. (Source: <http://showbiz.liputan6.com/read/2562817/kerokan-jessica-iskandar-bikin-netizen-geli>)

While the pattern of scouring on the back is depicted in Figure 3 .



Figure 4: Scheme of kerokan. (source: <http://www.kabarumat.com/2014/09/544/kerokan-berbahayakah-bagi-kesehatan>)

The end of reactions that occur in kerokan has increased the production of platelets and activation with some implications

of decreased viral load pathogens in the body circulation. Pathogen virus is a virus that can cause disease in the host's body, in this case, is human. Thus, in addition to healing the cold, kerokan can reduce the outbreak of disease due to virus pathogen

CONCLUSION

Kerokan is an activity that is believed by the Java community to eliminate the colds. This is not a myth. There is an integrated physics, chemical and biology concept that can explain scientifically how sweeps can relieve the symptoms of colds.

ACKNOWLEDGMENTS

This project is partially supported by Universitas Muhammadiyah Surakarta.

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