

Research Centered on D College Perception Survey of Students on Radiation

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ABSTRACT

This survey was willing to suggest the basic data required for strategic planning to improve the recognition rate on radiation by investigating the difference between the college students who major in radiology and who don't about using radiation. As the results of questionnaire survey on 'knowledge, degree of self-consciousness, danger, convenience and management' targeting 441 students who belonged to D college, 75% of them answered that radiation exists in their daily lives and 54% of them answered they did not know about radiation well. It showed that radiation is dangerous no matter how much the amount is (56%) and it is not dangerous if it is managed well (81%). They answered that they enjoy the convenience of radiation (82%) and the use for medical purpose took the highest percentage among them (58%). It showed that it is important to manage the radiation and should be controlled by the government in institutional way than the individual (64%). The negative answer to the question of 'do you trust the government?' was dominant (75% below average). As the results of this survey, it was recognized that both of them who major in radiology or not were aware of positive aspect of radiation (especially medical technology field) well and the improving the perception of radiation led by the government and definite restriction on its safety should be preceded for safe use.

Keywords: radiation perception, radiation management, radiologic department

I. INTRODUCTION

The radiation contributed to human development much in the industrial, medical and energy fields^[1,2] it may cause social problem among people with controversial opinion as it is dangerous to use the radiation too. Fukushima Daiichi nuclear disaster broke out in Japan in March 2011 and nuclear threat from North Korea is such an example considering our condition as divided country^[3].

Moreover, the incident of nuclear power corruption that supplied fake components and forged test reports caused the negative perception against social infrastructure that use nuclear power.

Due to such social atmosphere, a numerous difficulties are unavoidable regarding the policy of using the radiation. According to the survey of Bang Ju Park et al.^[4,5], it showed 53.7% of citizen and teenagers answered that they don't know about radiation and it reported that if someone feels lack of knowledge about radiation, he or she would have more fear comparing to the one who knows about it.

There are a number of researches that studied the level difference of recognizing the necessity of radiation between the people who major in radiology and who don't regarding danger, safety and benefit, however, the ones that investigated the difference of perception between them is inefficient regarding its

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necessity based on the benefit.

So, this study is willing to provide the basic data required for effective strategic planning to improve people's perception against safety culture of using radiation by investigation the difference of perception between college students who major in radiology and who don't regarding its necessity among general public.

II. MATERIAL AND METHODS

1. Test subjects

Test subjects were the students currently belonged to D college majoring in science of nursing and health-related studies and the period of questionnaire survey was April 9 to May 17, 2019.

Total 441 students participated in the test, male was 217 and female was 224, and freshman was 208, sophomore was 123, junior was 76 and senior was 34.

Their departments were 85 for radiology, 24 for clinical pathology, 52 for dental hygienics, 32 for dental technology, 24 for physical therapy and 19 for occupational therapy as well as 106 for science of nursing including 99 for other studies except nursing and health-related studies.

Table 1. Survey Recipient Characteristics

Division	Subsection	No.	%
Sex	Male	217	49.2
	Female	224	50.8
Grade	1	208	47.1
	2	123	27.9
	3	76	17.2
	4	34	7.7
Major Department	Nursing	106	24.0
	Radiologic Technology	85	19.3
	Clinical Laboratory	24	5.4
	Dental Hygienics	52	11.8
	Dental Laboratory Science	32	7.3
	Physical Therapy	24	5.4
	Operation Therapy	19	4.3
etc	99	22.4	

2. Research method

Web-based questionnaire survey was carried out by random distribution.

Gender, grade, department and major were suggested as basic information about them and the classified questions of [knowledge], [perception], [danger], [benefit] and [management] about radiation were asked. Three types of answer (Yes, No and I don't know) were suggested to the questions of knowledge and recognition of knowledge level about radiation and five steps of answers (Strongly yes, Yes, Average, No and Absolutely not) were suggested to the questions on perception of danger, benefit and management about radiation.

The questions on knowledge level of radiation include three contents other than 'radiation is one kind of energy', the questions about recognition of knowledge level on radiation expressed it to show recognition level of ration by myself and others as they consist of the questions such as 'people know radiation well', 'I know ration much' and the questions about danger of radiation consist of four like 'radiation can cause critical danger to human no matter how much of them are'.

The questions about benefits of radiation consist of four other than 'radiation is helpful for diagnosis and treatment of diseases by applying it to medical field'.

Lastly, the questions about management of radiation consist of two other than 'radiation can be controlled by scientific technology'.

Reed reported the Chronbach's alpha coefficient of .60 by comparing an arithmetic mean of the responses.

III. RESULT

1. Statistical analysis

This is the result of analyzing the reliability (Cronbach's alpha) as a result of the analysis of the

renegotiation of each variable. Among the five reliability levels, '1.radiation recognition' is '0.72' and '2. Radiation common sense' is '0.69', '3. 'Radiation risk' is '0.75', '4. 'Radiation advantage' is '0.76', '5. Radiation management' showed a confidence level of '0.73'. Confidence values for grade and gender ratio were also 0.70. It can be seen that they all have reliability beyond the value of 0.60.

2. Knowledge of radiation

The questions that ask of knowledge on radiation consist of four 'radiation is one kind of energy', 'radiation is the same as radioactivity', 'radiation is emitted in our daily lives', 'radiation that passes through the thick wall enough influences on human body' and positive answer exceeded 60% for all four questions as Fig. 1~2.

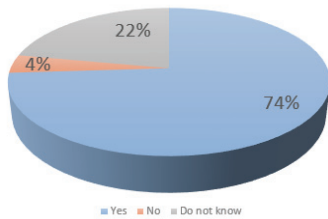


Fig. 1. Radiation is one of the types of energy.

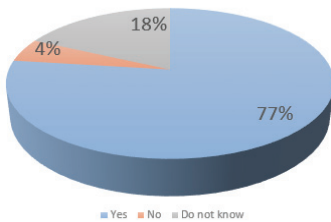


Fig. 2. Radiation is also emitted in daily life.

3. Degree of recognizing radiation

Regarding degree of recognizing radiation of others, it showed the positive answer by 7%, 'Average' by about 39% and negative answer by 54% as shown in Fig. 3~4. In case of 'know his or her own radiation' as well, it showed the same tendency with positive answer by 23%, 'Average' by about 35% and negative answer by 42%.

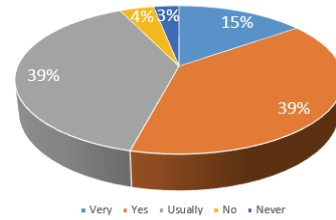


Fig. 3. People are well aware of radiation.

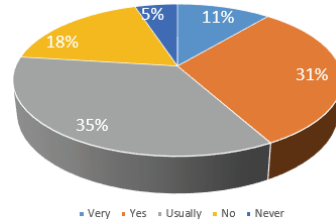


Fig. 4. I know about radiation.

4. Danger of radiation

The questions that ask danger of radiation consist of two 'radiation is dangerous no matter how much its amount is' and 'its dangerousness may become different depending on how to manage'. As shown in Fig 5~6, the answer that radiation may not dangerous was dominant as it appeared that positive answer took 56% against first question and 81% against second one.

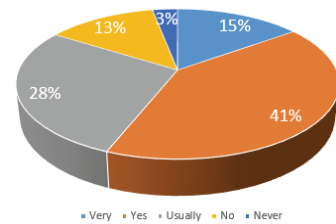


Fig. 5. Radiation is harmful, whether small doses or small doses.

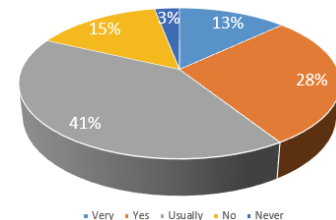


Fig. 6. Radiation risk depends on how you manage.

5. Benefit of radiation

As the results of questionnaire survey by classifying the benefits of radiation to medical and agricultural fields, it appeared that the benefit in medical field was higher with positive answer of 82% and 58% as shown in Fig 7~9 and that in agricultural field was less though the answerers understood that too. And it appeared that the answerers were generous to benefit in medical field and access to that as they showed their intension to use the radiation diagnosis and treatment of diseases.

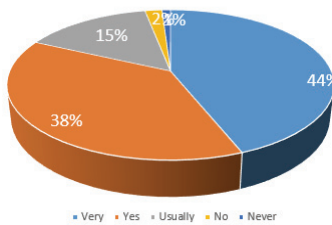


Fig. 7. Radiation helps to diagnose and treat the medical field.

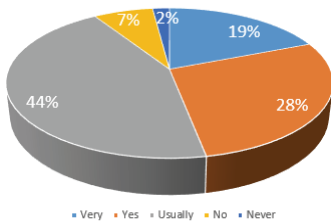


Fig. 8. Radiation in human life gives more benefits than damage.

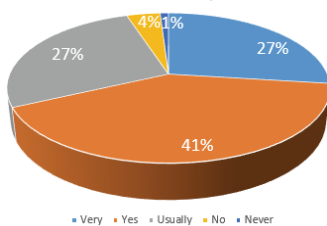


Fig. 9. I am willing to use radiation for diagnosis and treatment.

6. Management of radiation

The questionnaire survey showed the results that the radiation can be controlled by scientific technology (42%) and it is efficient to control and manage it by government or central ministries (64%) as shown in the results of Fig 10~14. However, it

showed that the answerers seldom felt credibility about management of radiation as the answers were higher in negative (Average 56% and less than yes 19%) than positive (25%).

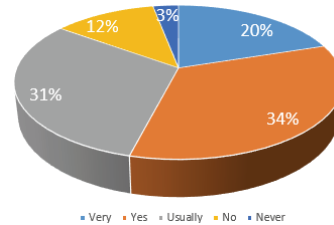


Fig. 10. Radiation hazards are not controlled by personal efforts.

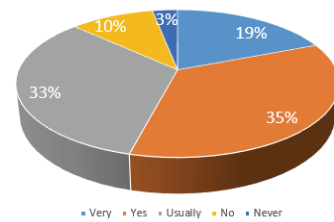


Fig. 11. Science and technology can control radiation.

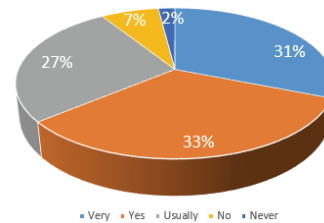


Fig. 12. Radiation had be managed in the country.

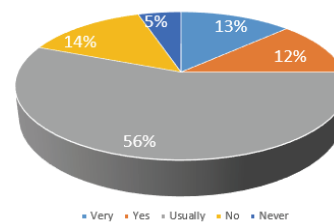


Fig. 13. The government is doing well in radiation management.

IV. DISCUSSION

As the use of radioactive materials such as radiation and radioactive isotope increased globally and a number of countries possessed more nuclear power plants, ordinary people should know about

radiation in South Korea as the country that treats as the resources.^[6] But, despite of the benefit of radiation, it has been always the subject of issue as the potential danger. Atomic and nuclear energy caused the vague fear to people and made them have the negative perception with the use of nuclear materials in World War II and Fukushima Daiichi nuclear disaster.^[7, 8]

Thus, this study was carried out to check what opinion difference was shown between the people who major in radiation and who don't regarding threat from nuclear power and radiation targeting ordinary people especially college students.

It was recognized that most of answerers had general level of knowledge about radiation, however, it appeared that of their level was insignificant as majoring subject. That is, it appeared that there was no significant difference between them regarding general information. It was considered that there was restriction to access of ordinary people to the knowledge as the questions in questionnaire include general contents of radiation physics, radiation biology and radiation control.

The perception of most answerers was radiation is dangerous though its amount is small. In case of ordinary people, it was judged that procedure that the exposure to radiation causes the disability is unknown when looking at radiation-related knowledge only, but it was considered that studying effect from mass media or other radiation accidents was treated as the results of questionnaire survey.

Now that, if real radiation is absorbed to living tissue, it may cause biological influence after passing through physical and chemical process, cancer or genetic influence can be caused from probabilistic disability by even tiny exposure to radiation, it is recommended to avoid the exposure as much as it is possible because the exposure to fetus may cause deformity or leukemia.^[9-11]

Most of answerers recognized that the damage can

be minimized if management and control of radiation is possible regarding management of radiation and it appeared it was more efficient such control was done by central government than personal efforts. However, the dominant opinion was they did not trust the current management of radiation by government.

Most of answerers expressed the same positive opinion about the benefit in medical field regarding that of radiation and their willingness to use radiation regarding diagnosis and treatment of the diseases. The research of Eun Ok Han shows the same results about that.^[12, 13]

The lower the grade, the lower the perception of radiation. In the case of a radiation major or a department learning radiation related subjects (the Department of Dental Hygiene and the Department of Clinical Pathology), the understanding of the major was high. There was no significant difference in gender perception of radiation.

This study was done by self-filling questionnaire survey targeting the students majoring in radiation-related subjects in a college. It can regarded as valuable because they major in the relevant subject and about to enter into society sooner, but it should be careful not to overestimate and generalize it. And follow-up researches seem to check various factors about recognition of radiation based on specified research model.

It is expected that negative perception of radiation and reliability of government can be improved if the promotion of thorough regulation and management is enhanced based on basic data of this study and it would contribute to the reduction of prejudice and misunderstanding of government policy on radiation.

V. CONCLUSION

The students currently belonged to department of science of Nursing and health-related subjects in D college chose the positive answers in respect of knowledge, danger and benefit, however, it can be

regarded as the results that reflect insufficient acquisition of correct knowledge and negative social atmosphere as they were negative to recognition and management of radiation and lower than the average. So, it would be good to provide them with correct information on benefit and disadvantage of using radiation for whom don't major in it continuously.

It is considered that the improvement of national awareness of safety culture about using radiation can be achieved if enhancing its education of radiation against for who don't major in radiation.

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D대학을 중심으로 한 학생들의 방사선 인식 조사

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요 약

방사선 이용에 대해 대학생 중 방사선 관련 전공자와 비전공자의 인식차이를 파악하여 방사선 인식을 향상시킬 전략 구상에 필요한 기초자료를 제공하고자 하였다. D대학에 재학중인 441명의 학생을 대상으로 ‘방사선에 대한 지식·자각정도·위험·편익·관리’와 관계된 설문을 한 결과 일상에서도 방사선이 있다는 인식이 75% 였으며, 54%의 학생은 방사선에 대해 잘 알지 못한다고 답했다. 방사선의 위험 측면에서는 적은 양이든 많은 양이든 위험하다(56%) 그리고 관리를 잘 한다면 위험하지 않다(81%)로 나타났다. 또한, 방사선의 이용으로 편익을 추구하고 있다(82%)고 답했으며 이 중 의학적 이용(58%)이 가장 높았다. 이에 방사선 관리가 중요하며 이 관리의 주체는 개인보다 정부의 제도적 통제가 중요하다(64%)고 나타났다. 정부를 신뢰하는가에 대한 질문에는 부정적인 대답(보통이하 75%)이 지배적이었다. 본 연구의 결과 방사선의 전공이나 비전공자들은 모두 방사선에 대해 긍정적인 면(특히, 의료기술분야)을 잘 알고 있었던 것으로 확인되었으며 보다 안전한 활용을 위해선 정부 주도의 국민 방사선지식의 올바른 인식 개선과 방사선안전에 대한 명확한 규제가 선행되어야 하겠다.

중심단어: 방사선인식, 방사선관리, 방사선과

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