

## Human Health Caring as General Education for Engineers: Introduction to a New Theory with Practice of Nursing

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### Abstract

Nursing has been given to nurse students as a professional education. But in today's aging society, not only nurses but also general public need to have the basic knowledge and skills of nursing. People with basic knowledge and technique of nursing will be willing to help people with disability.

Then Takayamas come to realize that the knowledge and skills of nursing will help engineers develop aiding instruments for physically and mentally challenged people. This made the author start a new subject of Human Health Caring for Engineers in the regular curriculum at a college of technology, which is the first regular course not only in Japan but in the world. For the last thirteen years 1,112 students finished the course 'Human Health Caring'. The introduction and evaluation of this nursing education for engineers are reported in this paper.

**Keywords:** Nursing education; Engineering; Subject in regular curriculum; Nursing education; Important roles in hospitals; Social changes

### Introduction

Since Meiji Era nursing education in Japan has been performed as a vocational education for producing professional nurses, who have been doing their important roles in hospitals and clinics. But with social changes like aging society in Japan, the work of nurses has not been limited in medical facilities but has been extended to social communities. The authors have come to realize that under the present day social changes, it is necessary to give nursing education not only to nurses and nurses-will-be but to the general public. The society needs health promotion, industry nursing, help for recovery from diseases and the skills to take care of the disabled and the aged at home. It is obvious that machines and instruments are one of the effective ways to solve these problems. In order to make engineers to be interested in the

solution of these social problems, we started 'Human Health Caring for Engineers' in the regular curriculum at a national college of technology in 1999. The practice of nursing education for engineers is reported [1-3].

### The aim and the start of 'human health caring'

The aim of teaching nursing in the regular curriculum is humanity education for engineers. In 1997 the Reformed Gender Equal Employment Opportunity Law was promulgated and the Gender Equal Society Law was enforced in 1999. With these circumstances, gender equality and empowerment have been encouraged at home and in the society, including work places. Changes, though small, have been seen in the male dominant society. This is one of the factors that enabled us to open a nursing course in the college of technology. In Japan, nursing education is categorized into seven fields: Introduction to Nursing, Adult Nursing, Gerontological Nursing, Home Care Nursing, Maternal Nursing, Child Nursing and Mental Nursing [4].

The course was named Human Health Caring and it was a full-year two-credit elective course, the introduction to nursing and nursing art in fundamental nursing being emphasized with gerontological nursing.

### Outline of Human Health Caring

#### Definition of human health caring

The Human Health Caring is an activity to help people to maintain and promote health, understanding them as comprehensive beings, that is, as physical, social and mental beings. It is a pragmatic course of study that through the activities not only to help others at every level of health

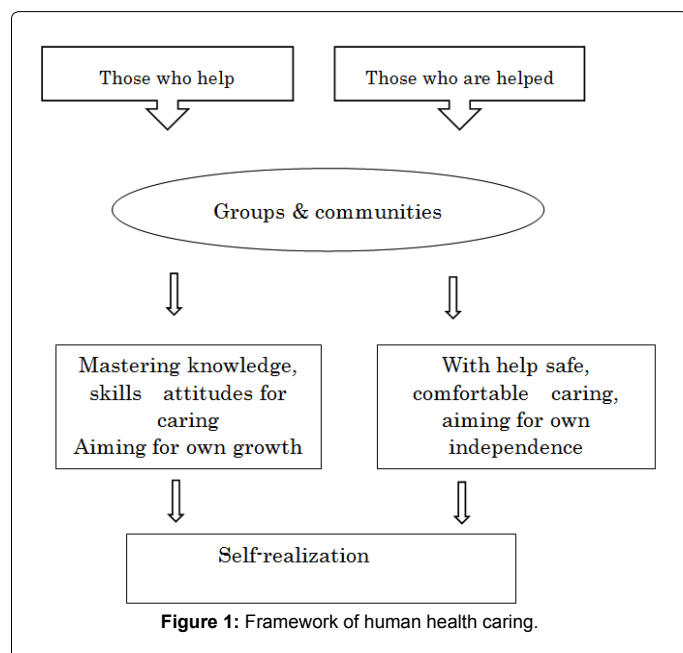


Figure 1: Framework of human health caring.

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and on the process of self-realization but also to aim at the own self-realization of helping people [2].

### Components and framework of human health caring

Three components are set in the course. The first is humanity which means every phase of life, including study and practical training of gerontology and of physical disability. The second is health which does not only mean the state without sickness but to help people to live independent life with their own quality of life. The third is caring

	Reaction of learners	study fields	goals
A	understanding	Knowledge	cognitive domain
B	realizing & feeling	Attitudes	affective domain
C	helping	motor skills	psychomotor domain

Table 1: Study fields, goals & reaction of learners cf. R.S. Bloom (1966).

1 <sup>st</sup> step
Basic knowledge of Human Health Caring (Understanding of humanity, health and society)
2 <sup>nd</sup> step
Basic skills of Human Health Caring (Skills for communication and for supporting life)
3 <sup>rd</sup> step
Exercises: Exercises in campus
Practice: Practice at institutions for old age people

Table 2: Three steps of human health caring.

Order	Contents
1.	Introduction to Human Health Caring Definition, framework, caring, humanism, nursing, life and living skills.
2.	Humanity and development task Human development stages, developmental task, life ethics, study of humanity for the equal cooperative society with disabled people.
3.	Helping skills
3-1	Skills of helping human activities 1 Observation with basic knowledge of vital signs Communication skills, role plays and process record Basic knowledge of nutrition and practice of meal
3-2	Skills of helping human activities 2 Basic knowledge of excretion Activities, recreation and body mechanics Practice of moving patients Basic knowledge of wheelchairs, practice with the elderly & with wheelchairs Living environment, sleep, rest, skin care & clothing
4.	Practice at nursing facilities for the aged Communication with elderly people Assistance with wheelchairs Special bathing machines & infectious diseases
5.	Welfare machines & universal design
6.	Social welfare service Social welfare, Normalization & barrier free Nursing care insurance system

Table 3: Contents of the course study.

Year	Nr. of students	Year	Nr. of students
1999	30	2006	69
2000	103	2007	81
2001	88	2008	94
2002	106	2009	86
2003	81	2010	91
2004	86	2011	104
2005	93	total	1112

Table 4: The number of course students.

which means the practical caring skills that enable learners to help the aged and people with disability, establishing good human relationship. Needless to say, both verbal and non-verbal communications are indispensable for good caring [5].

The framework of Human Health Caring is shown by Figure 1. It shows that people who help as well as those who are helped in groups and communities seem to be aiming at their own independence and self-realization.

### Characteristics of human health caring and study fields

Study fields and attainable goals are shown in Table 1. The aim of this course is to give engineers the opportunities to learn to understand human beings through theory, practice and experience. In the rapidly aging society, not only caring mind and technology but the helping devices are indispensable. We built up the curriculum intending to put these necessities together in our society [6]. The Theory of Curriculum of Nursing Education by Olivia and Watson [7] and the Theory of Communication by Wiedenbach [8] were adopted for building the syllabus.

### The outline and steps of learning of the course

The course was named 'Human Health Caring' in which the course attendants were all engineering major (Table 2).

### Syllabus and Teaching Methods in 2012

#### Credit number and participants

2 credit full-year course: elective for 4th year students.

#### Aims

One of the most important aims of this course was to make engineer students concerned about the old and the disabled by learning and experiences. And realize the problems of the society.

#### Goals

- Students are supposed to have knowledge and skills [9] to help the old aged and the disabled by learning and experiences.
- Students study and understand barrier free and universal design by learning normalization.
- From the engineering point of view, students are expected to find social problems and the solution.

### Contents of the course

In 2013, 24.1% of the population of Japan is old age people [10]. The life expectancy of male is 79.6 and that of female is 86.4 years old. The objects of caring in this course were elderly and/or disabled people. The students studied about the human development and life cycle and learned the basic knowledge and skills of caring, which is indispensable for developing welfare devices (Table 3).

### The number of course students

The majors of these elective course attendants were mechanical engineering, electric and electro engineering, civil engineering and computer science and engineering (Table 4).

### Teaching methods and evaluation

In order to get the students well-motivated, as the technical terms in nursing being unfamiliar to them, we used audiovisual aids, giving the opportunities for practices and experiences (Tables 5 and 6).

Methods	Frequency	Contents
Lecture	13	Introduction, human development
Workshop	1	A good life
Exercise	10	Personal history
		Communication analysis by process record
		Self-care and room setting
		Planning daily schedule and events at an elderly home
		Role playing
		Vital sign measuring
		Meal assistance
		Practice of moving patients
		Experience on wheelchairs &, experience with the elderly people
Practice (off campus)	1	Practice at a nursing welfare elderly home
Audiovisual aids	5	Assistance of disabled people
		Meal assistance
		Excretion assistance
		Changes of position

Table 5: Teaching methods.

Evaluator	Content of Evaluation
Students	Excellent- 4.6/5 Eye opener about humanity (Attentive, positive, few failed)
Facility director	Greatly expect on engineers' concern about the needs of the old and the disabled
Facility nurse	Real practical education needed by society
Society	Awarded by the Japan National Higher Education Council(2006)

Table 6: The evaluation of the course.

## Results of practice at a nursing welfare elderly home

The institution for student practice was a large nursing welfare elderly home in G city. Thanks to thoughtfulness of the institution, students were given rich practice, which was the afternoon periods in the second semester, after studying about elderly people, infection of diseases and experiencing elderly life and wheel chairs [11].

## Aims of practice

1. To cultivate attitude to respect elderly people by learning and experiencing with them.
2. To learn about welfare machines and barrier free
3. To learn about welfare social resources and welfare services at welfare facilities.

After the orientation by the head of a welfare institution, students start practice beginning with wheelchairs to various welfare machines and devices. They learn and experience much of hardware and software of the institution. At the end of practice they establish good communication and relationship with elderly people. They experience pleasure of being thanked.

## Conclusion

### Significance of human health caring at a college of technology

There has been a great expectation that engineers are able to

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contribute not only to the development of welfare machines and devices but to the improvement of houses and buildings of these facilities.

## Teaching method

Engineering students, unfortunately, have not many opportunities to learn about humanity. The practice at nursing institutions for elderly people has become an eye opener with humanity. Learning by experience has been effective

## Nursing education

In today's aging society, non-professional nursing education is indispensable in order to live together, helping one another. Needless to say, a great many people are to be helped with new inventions and innovation by engineers.

## Inner changes of students

After the practice at the nursing welfare facilities, the students have come to show deep understanding with elderly people. They also have realized the important social role of engineering by the experience of being thanked by elderly people in the facility.

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