Early Exposure of Medical Students to Types of Patient Care Provided Across Life Cycle Stages

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Abstract

In Japan, most medical students enter medical school right after high school. Their medical school education will last 6 years, and during this time, students must acquire not only medical knowledge but also an ability to make ethical decisions. To succeed in these endeavors, students need to transition from passive learning, the educational method generally employed in primary and secondary schools in Japan, to self-initiative-based learning. Such transition requires support. Early clinical exposure has been introduced at medical schools in Japan, and we, at St. Marianna University Medical School, have introduced a unique early exposure program based on our school philosophy: respect for the dignity of life. The exposure is of two phases. In phase 1, students shadow clinicians working in the University hospital. In phase 2, students are placed in real-life settings, such as maternity clinics, nursery schools and kindergartens, general clinics, and welfare facilities. Upon completion of each exposure, students responded to a questionnaire. Our early exposure program is based on the premise that, in being exposed to medical facilities rather than simply learning medical technology, students with no specialized medical education will learn social organization, discipline, and interpersonal communication. Professionalism is indispensable in the world of medicine, and acquiring professional skills is of necessity for future doctors.

Keywords: Early exposure; prototype early exposure program; respect for human life; Japan; teaching methods.

Introduction

Students starting medical school need to transition from passive learning, which is the primary form of knowledge acquisition up to that point, to active, self-initiative-based learning. However, support is required for this transition. During their undergraduate medical education, students must acquire not only medical knowledge and treatment skills but also an ability to reason clinically, collaborate on a multidisciplinary level, and make ethical decisions. Early exposure is an educational method that is aimed at motivating students by allowing them to come into contact
with various real-life settings. For medical students in particular, this means exposure to clinical settings during the early part of their medical education. Early clinical exposure is widely employed in Europe, and its educational effectiveness has been reported (Basak et al., 2009). Clinical exposure has been introduced at many medical schools and medical faculties at various universities in Japan, including ours, as part of the first-year curriculum. According to a recent survey (Nara, 2017) regarding the various curricula offered by 80 medical schools and medical faculties throughout Japan, 69 (86.2%) provide exposure before clinical training. In addition, 47 of the 80 now provide this exposure to first-year students, indicative of increased interest in this educational method. This exposure focuses specifically on medical students who have not yet received specialty training and primarily entails exposure to practical medical settings, such as nursing homes, regional medical facilities, home care clinics, and care facilities for the handicapped.

The educational philosophy of St. Marianna University School of Medicine is rooted in the Christian concept of the dignity of human life. We prepare students to practice medicine with respect for the dignity of life, and this thinking underlies the school’s early exposure program. St. Marianna University School of Medicine is the only medical school in Japan that was founded on Christian values, especially as they pertain to human life, and we have not seen any examples of early exposure at medical schools whose programs were developed on the basis of such a philosophy.

The Education 2030 principles advocated by the Organization for Economic Co-operation and Development (OECD) (OECD 2018) include the ability to bring about transformation as a competency needed by today’s youth and by the youth of tomorrow. The premise is that it is important to prepare students for cooperation with others and to foster self-regulation (self-control, self-efficacy, a sense of responsibility, problem-solving skills, and adaptability). Acquiring competencies by incorporating knowledge gained through the continuous process of anticipation, action, and reflection is advocated, as is the structuring of curricula in a way that encourages students to relate their learning to the real world and that provides opportunities for them to do so.

Technology has, in recent years, changed substantially the ways in which young people communicate, and the smartphone in particular has become an indispensable communication tool in everyday life. The fact that social media are being used for more than conversation means that opportunities for direct conversation with others are dwindling. We believe that opportunities for direct, face-to-face exchange between individuals are actually in short supply (Kazama, 2009).

Following an announcement by the Educational Commission for Foreign Medical Graduates (ECFMG 2010), St. Marianna University School of Medicine formulated a plan to establish an internationally recognized medical training system, including a medical education program based on the World Federation for Medical Education (WFME) global standards. Thus, a new outcomes-based education curriculum (WFME 2015) was introduced. According to the WFME global standards, a third of the entire educational period (72 weeks) should be allocated to clinical exposure, and, ideally, students should be provided opportunities for contact with patients during the early years of their study. In keeping with these standards, we extended our clinical clerkship period from 40 weeks that began during the fifth year of study and extended into the sixth year to that of 64 weeks that begin during the fourth year and extend into the sixth year. We also expanded our compulsory exposure program so that before students start their clinical clerkships during their third year, they are exposed to care settings. The exposure is "early," i.e., it starts during the first year of study and extends into the third year. This practical exposure is of three components: the experience itself, documenting the experience, and reflecting upon it.

We have since conducted a study to assess the effects of our early exposure program, as described by the students themselves, and we report our findings herein.
Methods

Participants

All students at St. Marianna University School of Medicine who were first-year students, either in 2016 (n = 128) or 2017 (n = 121), participated in the early exposure program and were included in the study.

Summary of Early Exposure

The exposure is divided into two parts: phase 1 and phase 2. Phase 1 exposure involves students riding along in ambulances and shadowing clinicians in the university hospital, whereas phase 2 exposure is extramural. Phase 2 exposure is geared mainly toward real-life situations, i.e., students participate in 2-week rotations at maternity clinics, nursery schools, kindergartens, other types of clinics, and nursing and welfare facilities (Figure 1). The objective is to instill in these students an interest in regional medical care, nursing, welfare, and preventive medicine while they learn about the early, transitional, and late phases of patients’ life cycle. Other objectives are to give students opportunities to observe fellow students and engage with them and to reflect on their own behavior and emotions, to explore means of communication, and to establish relationships with personnel in various disciplines, and for each student to formulate a mental image of himself/herself as a doctor.

Figure 1: Early exposure to life cycle stages

The second- and third-year students are exposed to facilities for severely handicapped children and adults, regional
comprehensive care facilities, and medical clinics, and they also interview practicing clinicians. The aim is to help these students understand the various roles played by physicians, building on the knowledge they acquired during their first-year exposure.

**Training Facilities**

Facilities close to the university had been asked to act as training facilities, and most were hospitals or medical facilities founded or staffed by alumni. A total of 65 agreed to participate, including 13 hospitals with a maternity clinic; 21 general clinics and private practices; 17 kindergartens; 7 nursing homes, 3 long-term care facilities for the elderly, and 1 short-stay center; 6 facilities for severely handicapped children or adults; and 16 regional comprehensive care facilities.

**Training Methods**

As part of the exposure program, the students document (in writing) each of their exposures. Before their participation in an exposure, they note their behavioral target(s), which are based on the targets for achievement outlined in the syllabus (Table 1). They then participate in the exposure, note the details, and reflect upon their experience.

**Table 1: Achievement targets of the early exposure program**

| Maternity clinic | Develop an appreciation for the wonderfulness of the creation of life and consideration toward parents by looking back on their own birth and on their maternity/paternity. |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                | Learn health management and health guidance according to each term of pregnancy.                                                                                                                      |
| 2                | Learn about the function of local obstetric care facilities.                                                                                                                                           |
| 3                | Learn about support and assistance needed by pregnant women/newborns.                                                                                                                               |
| 4                | Learn about appropriate attitudes and about giving consideration by observing how medical staff deal with pregnant women and their families.                                                      |
| Kindergarten     | Experience the child care environment and child care in practice.                                                                                                                                    |
| 1                | Understand concretely the function of kindergartens/nursery schools.                                                                                                                                  |
| 2                | Understand the flow of the daily child care routine and participate in the activities.                                                                                                                 |
| 3                | Understand the development of young children through observation and engagement.                                                                                                                      |
| 4                | Talking to children and feeling the enjoyment of nursing care, leading to further learning.                                                                                                           |
| 5                | Understand safety and disease prevention.                                                                                                                                                            |
| Hospital/clinic  | Experience medical care in a real-life setting.                                                                                                                                                        |
| 1                | Understand and sympathize with patients deeply.                                                                                                                                                        |
| 2                | Understand the function and role of long-term care services.                                                                                                                                       |
| 3                | Understand the job types and practical roles of facility staff; understand the need for cooperation between staff members, especially with respect to nursing care, regardless of job category. |
| 4                | Understand the mechanism of medical care and importance of collaboration by observing or assisting doctors, medical paraprofessionals and other health care providers in their work. |
| 5                | Understand the objectives of medical students, understand ethical standards, and experience transformative learning by incorporating new knowledge and practice. |
| Nursing and welfare facilities | Understand the social role, collaborations, and function of workers in welfare facilities.                                                                                                           |
| 1                | Understand the feelings of elderly persons and caregivers in welfare facilities.                                                                                                                        |
| 2                | Understand the function and role of long-term care services.                                                                                                                                       |
| 3                | Understand the job types and practical roles of facility staff; understand the need for cooperation between staff members, especially with respect to nursing care, regardless of job category. |
| 4                | Communicate with residents and establish relationships of trust.                                                                                                                                     |
| 5                | Learn about assisting the elderly with activities of daily life.                                                                                                                                     |

Exposure is executed in accordance with the task schedule provided before each exposure, so in the maternity clinics, the students observe outpatient services, surgery, and delivery. In the kindergartens, the students guide the children into the school and participate in actual child care and discussions with the teaching staff. In the hospitals and clinics, the students observe outpatient care, surgery, and home-visit medical treatment, whereas in the elderly...
care facilities, they perform nursing care and interact with newly admitted patients.

**Evaluation**

As part of the exposure program, each first-year student creates a portfolio, and students’ portfolios are evaluated by selected St. Marianna University School of Medicine faculty members according to a rubric formulated in line with the program goals. The study participants did this, and they also invited the instructors they had met with at specific facilities to a poster session that was held at the end of the academic year. Further, they discussed their experiences with these instructors, with each other, and with their St. Marianna instructors. The poster presentations were evaluated by faculty members in terms of the presentation itself, the poster design, and the poster contents.

**Questionnaires**

Once a student completes an exposure at a particular facility, he or she fills out a questionnaire covering their satisfaction with the experience, adding any personal comments they wish. The questionnaire is returned to the Student Affairs Office, where data from the questionnaires are compiled and analyzed.

**Results**

The questionnaire response rate was 85.2% (109/128) in 2016 and 77.7% (94/121) in 2017. The first question asked was *How satisfying was the experience?*, and when we compiled students’ responses for each of the facilities, we found that more than 80% of students reported being satisfied or very satisfied with their exposure to the maternity clinics, hospitals and clinics, and elderly care facilities in both 2016 and 2017 (Figure 2). However, only 63.5% of students reported being satisfied with their exposure to kindergartens in 2016. In addition, the percentages of students reporting satisfaction with their exposure to maternity clinics, kindergartens, and hospitals and clinics were higher in 2017 than in 2016. However, the opposite was true for the elderly care facilities, with a higher percentage of students reporting satisfaction in 2016 (82.6%) than in 2017 (81.8%). When we examined students’ viewpoints regarding their kindergarten exposures (Table 2), we found that students who reported being dissatisfied were often students who participated during the first year of the exposure program (2016), and they commonly reported that they were asked mainly to do chores (sweeping, for example).

*Figure 2: Learners’ satisfaction level per facility type*
Table 2: Questionnaire responses of students exposed to kindergartens Points of satisfaction

| Good points                                                                 | 2016 | 2017 |
|----------------------------------------------------------------------------|------|------|
| I learned how to contact children.                                         | 17   | 15   |
| I saw physical and mental growth of kindergarten kids.                     | 5    | 8    |
| I was taught appropriate attitudes toward kids and staff.                  | 2    | 1    |
| I understood the difficulties faced by kindergarten teachers.              | 1    | 2    |
| Points of dissatisfaction                                                  |      |      |
| I was made to do only chores (cleaning).                                   | 14   | 4    |
| The kindergarten side did not understand the intention of practical training.| 4    | 0    |
| It was not an exercise pertaining to medicine or health.                   | 1    | 0    |
| Leaders’ educational skill was not high.                                  | 1    | 0    |

Themes that came to light out of students’ self-reflection are shown on Table 3. A high number of students were of the opinion that the early exposure experience allowed their self-confidence to blossom.
Table 3: "Awareness" reported by students after each exposure

| Item                                | 2016 Number of responses | 2017 Number of responses | An example                                                                 |
|-------------------------------------|--------------------------|--------------------------|----------------------------------------------------------------------------|
| (1) Improved motivation to be a doctor | 13                       | 6                        | My aim to be a doctor became concrete, and my motivation to study increased. |
| (2) Improved professionalism        | 1                        | 3                        | I learned the importance of courtesy and attentiveness. I also learned appropriate attitudes of a doctor. |
| (3) Awareness of responsibility     | 13                       | 14                       | My attitude changed. I think that my awareness as a medical student became clearer. |
| (4) Improved skills                 | 16                       | 5                        | My ability to communicate with individuals—from kindergarten children to the elderly—improved. |
| (5) Increased viewpoint diversity   | 9                        | 0                        | I was able to see both the difficulties of the work in the real world and the accompanying responsibilities, and I recognized how much I lack these. |

Discussion

In Great Britain, where students enter medical school right after secondary school, students desiring to enter medical school are encouraged to obtain relevant work experience before graduating from secondary school. This work experience is reviewed by the student's secondary school teachers as part of the medical school selection process before the student sits for the entrance examination. For 16- to 18-year-old secondary school students, the work experience can consist of shadowing, volunteer activity, and/or observation. Some students have family members who are medical professionals, but work experience obtained from persons who are not family members is thought to give students a fairly objective understanding of the medical world. It is also thought to support the transition to acquired competency, focusing primarily on reflection, which is important from the time students enter medical school and onward (Watanabe et al., 2018). There are very few high schools in Japan that encourage work experience before students take the medical school entrance examination, and there are a number of students who will feel disoriented after starting medical school because they have focused solely on excelling academically.

Previously, phase 1 of St. Marianna's early exposure program entailed only in-hospital observation and ambulance ride-alongs for first-year students. As a result of changes made to the curriculum based on international standards highlighted in the publications issued by the ECFMG (ECFMG 2010; Kazama 2009), extramural exposure was provided to students who were admitted in 2016. When St. Marianna University School of Medicine was established, the intention was to raise up doctors who have a sense of duty, who recognize the dignity of life as espoused by Christian doctrine, who are capable of serving society, and who strive to improve human welfare by practicing evidence-based medicine. In keeping with this intention, we now incorporate into the first-year compulsory religious education course informational material that will acquaint students with patients' life cycle. Phase 2 of the first-year exposure augments this course material by giving students a direct look at clinical practices that meet the needs of patients as they advance through life. The curriculum has been structured to synchronize the two, and the end product is a curriculum in which clinical exposure is incorporated into the religious study courses so that the dignity of human life and respect for patients as individuals take on real meaning (Figure 3).

Figure 3: Relationship between early exposure and religious studies
The early exposure program is based on the premise that, in being exposed to medical facilities rather than simply learning medical technology, students with no specialized medical education will learn social organization, discipline, and interpersonal communication. Professionalism is indispensable in the world of medicine, and acquiring professional skills is of necessity for future doctors. Okazaki et al., (2012) reported that exhibiting inappropriate behavior is most common during medical students' first year and that such behavior tends to decrease as students advance, underscoring the importance of providing instruction to counteract inappropriate attitudes early in students' educational track. We believe that placing students in settings outside the university and where they are in the minority is an important key to cultivating professionalism.

The percentage of students reporting satisfaction with their kindergarten exposure during the first year of the program was relatively low. This could be because the actual intention, i.e., mutual exposure of the students and instructors, was not well communicated to students, a shortfall that came to light when we evaluated the questionnaires. Kindergartens were the only facilities where students were not exposed to medical or nursing care, and we believe that the students were not keenly aware of the benefits of the exposure they received at the kindergartens, where we think they gained an understanding of mind and body development that occurs during childhood, where they were furnished with some of the preparation and readiness needed for their role as educators, and where they became aware of details of organizational management and regulation. We paid attention to this point during the second year of the program, and because we provided, in advance, a detailed explanation of the intention of the kindergarten exposure, the degree of student satisfaction increased, i.e., the number of comments regarding lack of mutual understanding of the intention decreased.
In analyzing the "awareness" reported by students after each exposure, we saw that students typically reported an increased desire to learn, increased awareness of professionalism, blossoming self-confidence, increased skills, and adoption of multifaceted perspectives. A high number of students reported that their self-confidence blossomed as they moved into the second year. Thus, we have come to believe that early exposure, as we have designed it, is an excellent stimulus, allowing medical students to grow in self-confidence. Early exposure during the initial years of medical school prepares students for contact with patients, persons who, simply by virtue of the fact that they are encountered in a medical environment, are different from persons these students have encountered in life previously. Early exposure also fosters in students an understanding of and interest in human diversity. We predict that such early exposure will promote the kind of self-awareness that allows one to perceive the thoughts of others. We have learned that there are universities in the U.S. that will adopt very early exposure programs to foster this type of awareness in high school students who aim to become doctors (Okazaki et al., 2012, Muncan et al., 2016).

Going forward, the valuable experiences students obtain through the early exposure that is provided will not be lost on themselves or on others. Rather, their personal development is recorded and presented in poster form to both fellow students and lecturers. We expect the early exposure program, including this presentation activity, to be associated with mutual development of both parties in a co-ownership framework.

**Conclusion**

Our early exposure program is based on the premise that, in being exposed to medical facilities rather than simply learning medical technology, students with no specialized medical education will learn social organization, discipline, and interpersonal communication. Professionalism is indispensable in the world of medicine, and acquiring professional skills is of necessity for future doctors.

**Take Home Messages**

- We incorporate into the first-year compulsory religious education course informational material that will acquaint students with patients’ life cycle.
- In analyzing the "awareness" reported by students after each exposure, we saw that students typically reported an increased desire to learn, increased awareness of professionalism, blossoming self-confidence, increased skills, and adoption of multifaceted perspectives.
- We expect the early exposure program, including their final presentation activity, to be associated with mutual development of students and lecturers in a co-ownership framework.

**Notes On Contributors**

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Appendices

None.
Declarations

The author has declared that there are no conflicts of interest.

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Ethics Statement

Our study was approved by St. Marianna University School of Medicine Ethics Committee as an exempt study on June 26, 2019. Reference No. 4464. The committee stated that “According to the Japanese laws and regulations, education-related studies are not classified as a matter of referral to the Ethics Committee. The Committee reviewed the study and the manuscript and concluded that this study has no ethical problem. We issued the Reference number (4464) for that. (Yasushi Hasegawa, MD., Ph.D., Chair, Ethics Committee, St. Marianna University School of Medicine).”

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