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A Study on the Daily Life Experience of Medical Students using the Experience Sampling Method

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ABSTRACT

The purpose of this study was to investigate the daily life experiences of medical students and to explore gender differences in these experiences using the Experience Sampling Method (ESM) as the method. The instrument, the Experience Sampling Form (ESF), consisted of questions on the external and internal experiences of the respondents. Data were collected from 2,035 ESFs by 91 students (male=52, female=39) at three medical schools for one week. The data was analyzed using the statistical tests of the t-test and χ^2 test. Activity places were significantly different by gender (χ^2=16.576, p=.001). Males spent more time in learning places such as schools, libraries, etc., whereas females spent their time in personal places, including their homes, dormitories, etc. Males undertook more learning activities than did females, and females undertook more social/leisure activities and basic life activities than did male students (χ^2=18.753, p=.001). They were in a learning place and performing learning activities. There were significant perceptual differences between males and females about their flow levels, competency levels, and difficulty levels, based on the activity type. These results can help us to understand the daily lives of medical students and can be useful in developing counseling programs and educational activities for students.

***Key words**: Experience Sampling Method, Medical Students, Flow, Emotion.*

1. INTRODUCTION

Individual daily life consists of routines while we see, hear, feel and think about various things that shape our experiences. Such experiences may have constant direct and indirect impacts on individuals as the negativity or positivity of their perceptions of life not only affects their lives but also have social repercussion [1]. To obtain information on individuals' daily experiences as well as the form of living-how the individual utilizes and feels about time and space-research has been undertaken since the turn of the 20th century [2].

The Experience Sampling Method (ESM), which is one of the most representative means of measuring daily living experiences, is a method of analyzing the context and content of daily life as well as the subjective experiences of individuals [3]. Data are collected with the participants performing their normal functions in their natural daily living environments, where they respond to a signaling device, such as a cellphone, at random points throughout their day [4]. The survey period ranges from one to three weeks with an average of five to seven responses daily. The main contents of investigation include the current physical behaviors, environment, and subsequent

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emotional states of the studied individuals. The ESM is assessed to have overcome the problems of recollection, response simplification, and summarizing associated with the self-reporting method-a conventional behavioral scientific methodology-and is currently being utilized as a practical means to collect immediate responses while individuals engage in their normal daily experiences [5].

Studies in Korea and abroad that employed the ESM typically examined the contents of the daily experiences and corresponding emotions of teenagers [1], college students [6], elderly individuals [2], housewives [7], working couples [8], gifted children [9], and athletes [10]. In addition, the ESM has also been used to examine the interaction between individuals' personalities and circumstances [11], exhibiting vast applicability in a number of disciplines, including medicine, domestic science, marketing, youth studies, and gerontology. Nevertheless, no study has examined medical students and analyzed their daily lives and their perceptions of their daily living experiences. Thus far, most studies have approached medical students' academic and psychological aspects via self-reporting questionnaires or interviews. However, as the ESM enables the investigator to capture individuals' daily living experiences directly as they are perceived by them, adopting the ESM to approach the daily lives of medical students would produce a more in-depth understanding. In this context, the objective of this study is to analyze medical students' external experiences throughout the day (e.g., places in which they spend time, people they are with, main activities) and internal experiences (e.g., feelings about current work, level of flow, perceived difficulty, perceived level of their own competence). The students were observed for one week, and the entire subject pool was analyzed as a whole as well as based on gender. Therefore, the purpose of this study is to provide useful information that can be used for student counseling and academic activities.

The objective of the research is as follows.

1. Identify differences in external experiences experienced in everyday life according to gender.

2. Determine whether there is a difference in the emotions felt about the external experience according to gender.

3. Identify differences in the degree of flow, perceived difficulty, and perceived competence of major activities in daily life by gender.

2. METHOD

2.1 Participants

The study population comprised first- and second-year medical students at one of three medical schools located in the areas of Incheon, Gyeongsang Province and Jeolla Province. The students were given adequate explanation regarding the objective, content, and procedure of the study prior to enrollment, and 91 students who provided informed consent were enrolled in the study. The participants comprised 27 first-year students (29.7%) and 64 second-year students (70.3%) with 52 male students (57.1%) and 39 female students (42.9%).

2.2 Methods

This study employed the ESM. The investigator sent a set number of text messages to the students' cell phones during the study period, and the participants were instructed to respond with descriptions of their situations and emotions at the moment they received the text message. More specifically, we sent five text messages every day from 10:30 AM to 10:30 PM at three-hour intervals for seven days (one week), resulting in a total of 35 text messages. The students were to respond immediately to the questions structured in a Google questionnaire form as soon as the text messages were received. It took less than two minutes for the students to respond to each text message. Responses had to be made as soon as the text messages were received, and students were unable to provide responses after 20 minutes. Before beginning the experiment, we asked the students to provide honest and detailed descriptions of their experiences at the moment they received each text message.

2.3 Measurements

We used the Korea-adapted version of the Experience Sampling Form (ESF), which was initially developed in the University of Chicago in the United States, and made partial modifications for the purposes of this study [6]. We selected the final question through reviews of three times. The ESF was broadly structured into external experiences and corresponding internal experiences of individuals in their daily lives.

2.3.1 Place of activity

Place of activity was measured with the question "Where are you right now?" This question collected information about the students' locations at the moment they received the text message. The students were to answer freely with responses such as lecture hall, dormitory, home, movie theater, restaurant, bus, and subway, and we categorized their responses into academic, resting, personal, and public spaces. Academic spaces included lecture halls, laboratories, PBL (Problem-Based Learning) rooms, study rooms, libraries, and seminar rooms. Resting spaces included club houses, rest areas, and student union buildings. Personal spaces included homes, relative's houses, rented rooms near school, friends' houses, and dormitories, and public spaces included coffee shops, movie theaters, buses, and streets.

2.3.2 Companions

The question "Who are you with currently?" was used to collect information about the people the students were with at the moment they received the text message. Responses included alone, friend, professor, parents, brother or sister, relative, and stranger. The responses were categorized into alone, family, friends, strangers, and professors and students. Friends included fellow students and romantic partners, and professors and students referred to the professors and students in class.

2.3.3 Major activities

For major activities, we surveyed what the students were mainly doing at the moment they received the text message. The students freely responded to the question "What are you

doing right now?" Responses included studying, eating, club activities, watching a movie, exercising, and watching TV. The responses were categorized into academic activities, leisure activities, basic activities, and others. Academic activities included studying, homework, seminar, experiment, and lecture. Leisure activities included club activities, watching a movie, surfing the Internet, reading a magazine, and taking photographs. Basic activities included eating, taking a shower, sleeping, eating snacks, and cleaning, and others included waiting for a bus, standing on the street, and in transit.

2.3.4 Internal Experience

As internal experiences, we measured the degree of emotion, flow, perceived difficulty, and perceived competence while doing a major activity. Degree of emotion was measured with the free-response question "How do you feel right now?" Responses included happy, stressed, depressed, comfortable, stable, satisfied, annoyed and angry, lonely, excited, anxious, lethargic, embarrassed, and competitive. The responses were divided into positive and negative emotions for analysis.

Degree of flow, degree of perceived difficulty, and degree of perceived competence were measured with the following questions: "How committed are you in the activity you are currently performing?" "How difficult is the activity you are currently performing?" "How competent are you to perform the activity you are currently performing?" The students responded to each item on a 5-point scale with a higher score indicating a higher degree of perception.

2.4 Data analysis

The unit of analysis was a single text message, so the text messages to which the students failed to respond were excluded from the analysis. A total of 2,035 responses (91 students for a week; response rate 63.9%) were included in the final analysis. A crossover analysis (χ^2 test) was performed to examine the differences in the students' demographic features in accordance with gender, differences in external experiences, and differences in emotions in accordance with external experiences. In addition, t-tests were used to identify any differences in the degree of flow, perceived difficulty, and perceived competence by gender, which were measured for different major activities.

3. RESULTS

3.1 Differences in Demographic Characteristics

We examined gender-specific demographic features of the students (Table 1). For living standards, the highest number of both male and female students claimed to be middle class with no statistically significant differences between the two groups. A higher proportion of male students claimed to have a religion (63.5%) than not while a higher proportion of female students claimed to have no religion (56.4%); there was no statistically significant difference between the two groups. About 88.5% of the male students were smokers while 97.4% of the female students were non-smokers. In addition, 73.1% of male students and 69.2% of female students were alcohol drinkers with no statistically significant differences between the two groups. In terms of residence, 40.40% of the male students lived at rented rooms near school while 66.7% of female students lived at dorms, showing a statistically significant difference between the two groups ($\chi^2 = 9.168$, $p = .01$).

Table 1. Demographic characteristics by gender

		Gender		χ^2	p
		Male N (%)	Female N (%)		
Economic level	High	5(9.6)	3(7.7)	.795	.85
	Middle-High	17(32.7)	11(28.2)		
	Middle	26(50.0)	23(59.0)		
	Middle-Low	4(7.7)	2(5.1)		
Religion	Yes	33(63.5)	17(43.6)	3.555	.06
	No	19(36.5)	22(56.4)		
Smoking	Yes	6(11.5)	1(2.6)	2.528	.12
	No	46(88.5)	38(97.4)		
Drinking	Yes	38(73.1)	27(69.2)	.162	.69
	No	14(26.9)	12(30.8)		
Residence	Dormitory	18(34.6)	26(66.7)	9.168	.01
	Rent house	21(40.4)	8(20.5)		
	Parents' house	13(25.0)	5(12.8)		

3.2 Differences in External Experience

We analyzed the frequency of external experiences for the entire student pool and for each gender by dividing the experiences into place of activity, Companions, and major activity (Table 2). For place of activity, the highest proportion of responses (40.8%) claimed to be in a personal space (e.g., home, dorm, and rented room near school) followed by academic (34.5%) and public spaces (21.1%). There was a significant gender-specific difference in the most frequented place of activity ($\chi^2 = 16.576$, $p = .001$) where a higher proportion of male students (36.4%) than female students (32.2%) were in academic spaces and a higher proportion of female students (41.4%) than male students (40.2%) were in personal spaces.

In terms of Companions (whom they were with), the highest proportion of responses claimed to be with a friend (39.9%) followed by alone (37.3%), professors and students (11.6%), family (9.7%), and strangers (1.5%). There was no significant difference between genders ($\chi^2 = 4.353$, $p = .360$).

For major activities, the highest proportion of students claimed to be engaged in academic activities (43.8%) followed by leisure (35.5%) and basic activities (16.7%). A higher proportion of male students (47.4%) than female students (39.3%) claimed to be performing an academic activity while a higher proportion of female students reported being engaged in leisure and basic activities (36.6% and 20.0%, respectively) than did male students (34.6% and 14.0%, respectively). There was a significant difference in major activity between genders ($\chi^2 = 18.753$, $p = .001$).

Table 2. Differences in external experience by gender

		Gender		Total	χ^2	P
		Male N (%)	Female N (%)	N (%)		
Activity Place	Learning place	412 (36.4)	289 (32.2)	701 (34.5)	16.576	0.00
	Rest place	52 (4.6)	21 (2.3)	73 (3.6)		
	Private place	455 (40.2)	372 (41.4)	827 (40.8)		
	Public place	212 (18.7)	216 (24.1)	428 (21.1)		
Companions	Alone	41 6(36.7)	343 (38.1)	759 (37.3)	4.353	0.36
	Family	105 (9.3)	92 (10.2)	197 (9.7)		
	Friends	459 (40.5)	353 (39.2)	812 (39.9)		
	Strangers	13 (1.1)	17 (1.9)	30 (1.5)		
	College people	141 (12.4)	95 (10.6)	236 (11.6)		
Main Activity	Learning activity	537 (47.4)	354 (39.3)	891 (43.8)	18.753	0.00
	Social/Leisure activity	392 (34.6)	329 (36.6)	721 (35.5)		
	Basic life activity	159 (14.0)	180 (20.0)	339 (16.7)		
	Other activity	44 (3.9)	37 (4.1)	81 (4.0)		

3.3 Internal Experiences Corresponding to External Experiences

3.3.1 Differences in emotions related to place of activity, Companions, and major activity

We analyzed the differences in students' emotions related to place of activity, companions, and major activity for each gender group (Table 3). Male students showed a significant difference in positive and negative emotions in accordance with place of activity (χ^2 = 128.924, p = .000). They most frequently had positive emotions in personal spaces (44.8%) followed by public (28.2%), academic (21.3%), and resting spaces (5.6%). On the other hand, they most frequently had negative emotions in academic spaces (51.0%) followed by personal (35.8%), public (9.5%), and resting spaces (3.6%).

There also was a significant difference in emotions in accordance with whom students were with at the time of the response (χ^2 = 51.372, p = .000). Students claimed to have positive emotions most frequently when they were with a friend (43.6%) followed by when they were alone (36.7%), with family (11.9%), and with professors and students (6.0%). On the other hand, they claimed to have negative emotions most frequently when they were with a friend (37.8%) followed by when they were alone (36.1%), with professors and students (18.8%), and with family (6.8%).

There was a significant difference in emotions depending on the major activities students were performing at the time of the response (χ^2 = 144.084, p = .000). They had positive emotions most frequently when they were performing leisure activities (46.7%) while they had negative emotions most frequently when they were engaged in academic activities (64.6%).

Table3. Differences of emotion in external experience by gender

		Male				Female			
		Positive emotion	Negative emotion	χ^2	p	Positive emotion	Negative emotion	χ^2	p
Activity Place	Learning place	118(21.3)	294(51.0)	128.924	.000	77(17.6)	212(46.0)	91.768	.000
	Rest place	31(5.6)	21(3.6)			10(2.3)	11(2.4)		
	Private place	248(44.8)	206(35.8)			205(46.9)	167(36.2)		
	Public place	156(28.2)	55(9.5)			145(33.2)	71(15.4)		
	Total	553(49.0)	576(51.0)			437(48.7)	461(51.3)		
Companions	Alone	203(36.7)	208(36.1)	51.372	.000	163(37.1)	180(39.0)	43.471	.000
	Family	66(11.9)	39(6.8)			70(15.9)	22(4.8)		
	Friends	241(43.6)	218(37.8)			171(39.0)	182(39.5)		
	Strangers	10(1.8)	3(0.5)			8(1.8)	9(2.0)		
	College people	33(6.0)	108(18.8)			27(6.2)	68(14.8)		
	Total	553(49.0)	576(51.0)			439(48.8)	461(51.2)		
Main Activity	Learning activity	162(29.3)	372(64.6)	144.084	.000	99(22.6)	255(55.3)	101.503	.000
	Social/Leisure activity	258(46.7)	133(23.1)			203(46.2)	126(27.3)		
	Basic life activity	109(19.7)	50(8.7)			115(26.2)	65(3.3)		
	Other activity	23(4.2)	21(3.6)			22(5.0)	15(3.3)		
	Total	552(48.9)	576(51.1)			439(48.8)	461(51.2)		

For female students, there was a significant difference in the type of emotions felt in accordance with place of activity (χ^2 = 91.768, p = .000). They claimed to have positive emotions most frequently when they were in personal spaces (46.9%) while they had negative emotions most frequently when they were in academic spaces (46.0%). In addition, female students claimed to have positive emotions most frequently when with a friend (39.0%) or alone (37.1%) but also had negative emotions most frequently when with a friend (39.5%) or alone (39.0%) (χ^2 = 43.417, p = .000). Female students had positive emotions most frequently when engaged in leisure activities (46.2%), whereas negative emotions were most frequently felt when performing academic activities (55.3%) (χ^2 = 101.503, p = .000).

Regardless of gender, the students examined in this study had negative emotions (about 51%) slightly more often than positive emotions (49%) overall.

3.3.2 Gender-specific differences in perceptions about major activities

We examined the gender-specific differences in perceived flow, perceived difficulty, and perceived competence for each type of major activity (Table 4). Degree of flow to academic activities was higher in male students (3.49 ± 0.956) than in female students (3.35 ± 0.978) (t = 2.151, p = 0.03), and perceived competence for academic activities was also higher in male students (3.67 ± 0.836) than in female students (3.45 ± 0.869) (t = 3.595, p = 0.000). However, there were no significant differences between genders in the perceived difficulty of academic activities (t = .321, p = .74). Male students perceived leisure activities as more difficult (2.08 ± 1.158) than did female students (1.86 ± 1.122) (t = 2.627, p = 0.01). There were no significant differences in degrees of flow, difficulty, and competence for basic activities between genders.

Table 4. Differences of perception in main activity by gender

		Learning activity		Social/Leisure activity		Basic life activity	
		Male	Female	Male	Female	Male	Female
Flow level	N	537	353	392	329	158	180
	M	3.49	3.35	3.63	3.52	3.72	3.56
	SD	.956	.978	1.053	1.099	.904	.929
	t	2.151		1.380		1.597	
	p	.03		.17		.11	
	M±SD	3.44(.967)		3.58(1.075)		3.63(.919)	
Difficulty level	N	537	353	392	328	158	180
	M	3.10	3.08	2.08	1.86	1.79	1.78
	SD	1.052	1.044	1.158	1.122	1.047	.983
	t	.321		2.627		.121	
	p	.75		.01		.90	
	M±SD	3.09(1.048)		1.98(1.146)		1.78(1.012)	
Competency level	N	523	344	387	322	157	179
	M	3.67	3.45	3.93	3.82	3.99	3.92
	SD	.836	.869	.928	.986	.937	.896
	t	3.595		1.611		.718	
	p	.000		.11		.47	
	M±SD	3.58(.855)		3.88(.956)		3.96(.915)	

4. DISCUSSION

The purpose of this study is to examine medical students' daily lives as they are lived using the ESM, which is a novel research tool in this topic. By doing so, this study aimed to promote a deeper understanding of medical students' on- and off-campus lives to provide useful data that could be utilized for student counseling or academic activities.

Most medical students were spending most of their time in personal spaces, such as home, followed by academic spaces, such as school, and female students spent more time in personal spaces than did male students. This is speculated to be due to the fact that medical students perceive themselves to have higher cognitive efficiency in personal spaces (e.g., home) than in academic spaces (e.g., school) [6]. This is also related to our findings, in which students had more negative emotions in academic spaces while having more positive emotions in personal spaces. In other words, medical students perceive that they could boost their efficiency in a variety of activities when they perform them in personal spaces, where they have more positive emotions than in academic or public spaces. Our findings revealed that both female and male medical students display monotonous and routine daily lives in which they spend most of their time in personal spaces, such as their homes, or academic spaces, such as school.

In terms of major activities, both male and female medical students were most frequently engaged in academic activities, and both also had negative emotions most frequently while performing academic activities (despite the fact that our study period did not overlap with their exam weeks). This is speculated to be a result of high academic stress with students constantly feeling tense and anxious while being burdened to take in vast medical knowledge in a short period and undergo endless exams, not to mention stress coming from grades and possible course retakes. Regardless of gender, students generally had higher negative emotions than positive with regard to place of activity, companions, and major activity, in which stress is again speculated to play a critical role. Medical students are able to maintain an appropriate level of stress—a level helpful for their studies—when the challenges that face them remain at a manageable level [12]. Furthermore, as positive emotions lead to positive outcomes [13], and having more positive emotions about their lives would enhance their quality of life [14], [15], it is important to help medical students to perceive and evaluate their lives more positively [16]. Of course, medical students probably are already striving to view their lives positively and relieve their stress by endeavoring to resolve various problems in their own ways. Hence, schools should provide academic and psychological counseling as well as an online counseling system that ensures anonymity so as to help medical students to relieve their stress more efficiently and feel more positively about their studies and their lives overall.

Both female and male medical students were found to spend much of their time with a friend or alone. This would be a result of the fact that more than 87% of the participants lived in dorms or rented rooms near school. In addition, patterns for both positive and negative emotions with regard to companions were similar; that is, students had positive emotions most frequently when they were with a friend, but they also had

negative emotions most frequently when they were with a friend. Medical students probably have realized that not only the quantity but also the quality of their friendships in college and on are different from those prior to college. In other words, they have realized that friendship has not only positive but also negative aspects, such as competition and conflict, uncertainty of relationship, and gap between their needs and satisfaction in their friendships [17]. In particular, for medical students, friends are both fierce academic competitors as well as emotional supporters who share difficulties and hardships associated with school life, which would explain the coexistence of positive and negative emotions with regard to friends. Interpersonal relationship—namely, friendship—is a source of the second-highest level of stress, following academic stress [18], and intimidation and distortion in interpersonal relationships facilitate maladaptation to life [19]. Therefore, it is important to help medical students to foster healthy interpersonal relationships, including friendships.

When we analyzed whether there are gender-specific differences in students' perceptions of their major activities in daily lives, we found that male students have higher perceptions than do female students in all activities. In other words, male students tended to perceive themselves to be more committed to academic, leisure, and basic activities; perceive such activities to be more difficult; and perceive themselves to be more competent to perform the activities than did female students. In particular, male students were more committed to and perceived themselves to be more competent for academic activities than did female students. This is similar to the findings of prior studies, in which male college students were found to be more committed to academic activities than were female students [20] and male medical students had higher self-efficacy (personal judgment or belief of one's competence) than did female students [21].

As a result of the above research, the educational implications are as follows. First, this study diversified approaches to medical education research by employing the ESM, which is a novel approach in this field. Second, this study provided objective data on medical students' school lives by exploring their daily lives. In general, professors wonder what their students do outside of class, making jokes about their students not investing much time in studying. Our results provide a partial answer to this question. Third, we could understand the main daily activities of medical students and the emotions they felt in these activities. They have the highest proportion of academic activities in daily life, but they have negative emotions about them. It also suggests that they have not received emotional support from their colleagues. These results suggest that emotional support is needed to improve the quality of life of everyday life of medical students. Forth, according to gender, there was a difference in commitment to learning activities and difficulty in leisure activities. This suggests that differentiated gender-specific program support is needed in daily life. This suggests that differentiated gender - specific programs should be supported for them. Therefore, this study is meaningful to provide the basic data to understand the everyday life and the emotions of the students, and to provide a system to support the students.

Nevertheless, this study has a few limitations. First, this study was limited to medical students in three medical schools in Korea, and the study population only comprised some first- and second-year students of these schools who provided informed consent, hindering generalization of the results. Furthermore, the methodology itself is limited in that it is difficult to understand the duration of an activity or link between behaviors merely by asking what the respondents were doing at the time they received a text message. Therefore, future studies should concomitantly use the ESM, personal interviews, and questionnaires to explore various situations lived by medical students and emotions felt during those situations [22]. Furthermore, studies should also expand the population to include premedical students as well as college medical students.

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