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# Awareness of Psychosomatic Medicine in Korea: Results From an Online Survey Conducted With Doctors and the General Public

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## ABSTRACT

**Background:** This study aimed to assess and compare psychosomatic medicine (PM) awareness, understanding, and related educational needs in doctors and the general public, and discuss how education for these groups should be provided.
**Methods:** The Korean Psychosomatic Society conducted an online survey targeting 101 doctors and 100 general public, aged 20–60 years. Sociodemographic data, PM awareness, understanding, PM-related keyword before and after a brief introduction to PM, and educational needs concerning PM were collected.
**Results:** PM awareness, understanding, and educational needs concerning PM differed significantly between groups. The doctor group reported a significantly higher PM awareness and understanding, and there were significant differences between the groups regarding the frequently-selected PM-related keywords. In the doctor group, they were "digestion," "functional," "irritable bowel syndrome," "pain," "psychogenic," and "somatic symptom disorder" in the general public group, they were "brain," "cause," "influence," "mind," "panic disorder," "problem," "psychology," "response," and "treatment." Additionally, the brief introduction to PM improved PM awareness in both groups. There was a significant difference in the frequently-selected PM-related keywords after the brief introduction. In the doctor group, the words significantly more selected were "association," "concept," "connection," and "influence" and the word significantly less selected was "mind." In the general public group, the words significantly more selected were "association," "connection," "irritable bowel syndrome," and "somatic symptom disorder," and the words significantly less selected were "autonomic nervous system," "brain," "menopause," "panic disorder." The two groups also diverged in their educational needs concerning PM. The most frequently selected needs in the doctor group were "stress and chronic pain," "mental health issues in cancer patients," and "stress and gastrointestinal disorders" in the general public, they were "how to self-manage stress," "stress and chronic pain," and "medical treatments for stress."
**Conclusion:** Doctors identified more PM-specific terms, whereas the general public had

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a vaguer understanding of PM. Even a brief education intervention significantly helped align the perceptions of both groups with current PM theory, highlighting the impact of education. Regarding PM educational content recommendations, the focus should be on stress education for the general public and on practical assessment and management of psychosomatic disorders for doctors.

**Keywords:** Psychosomatic Medicine; Awareness; General Public; Doctor; Mind–Body Interaction; Stress

## INTRODUCTION

Psychosomatic medicine (PM) is the medical field that deals with the relationship between mind and body. It is a comprehensive, interdisciplinary discipline that evaluates psychological factors influencing individual vulnerability, and the course and outcome of illness; considers clinical practice from a biopsychosocial perspective; and develops special interventions that integrate psychological therapies for medical disease prevention, management, and rehabilitation.[1] PM has been recognized under various names, such as biopsychosocial medicine, integrative medicine, holistic medicine, and consultation-liaison psychiatry.[2,3] As these various names imply, PM has a wide academic scope rendering it a rather unfamiliar and unclear field both for the general public and medical doctors.[4,5] However, no prior study has directly assessed the awareness and understanding of PM.

Recent years have seen an increase in psychosomatic approaches. Not limited by the biopsychosocial theoretical paradigm, PM specialists deal with chronic illness management and the differential diagnosis and management of co-occurring psychiatric disorders; they also collaborate with nonpsychiatric medical professionals.[4] PM extends beyond psychiatric management to incorporate knowledge of individual, cultural, and contextual factors that interact with numerous behavioral health factors.[4] PM influences both patients and their families and is associated with shortened illness duration, increased quality of life, and reduced global economic health burden.[4,6] Therefore, enhancing awareness of PM through various educational interventions is essential.

Significant gaps in PM knowledge can lead to incorrect opinions, such as under-recognition of PM as a distinct specialty or ignorance of the conditions that PM specialists primarily treat, and result in critical attitudes toward the field.[7] General practitioners (GP) in primary care show significant variations in their clinical practice depending on their level of PM training, and the proportion of patients receiving appropriate PM treatments increases with the GP's level of PM training.[8] This implies that determining nonpsychiatrists' PM-related educational needs can lead to more useful educational interventions. This is especially so as psychiatry education type and style, as well as the degree to which psychiatry education is provided, differ significantly across medical specialties.[9]

This study aimed to assess and compare PM awareness (whether or not the participants had ever heard of PM) and understanding (whether or not the participants had an understanding of PM), knowledge of PM-related keywords before and after a brief introduction to PM (measured using keywords that the participants thought described PM), and major educational needs concerning PM among two separate samples of the general population and doctors. We hypothesized that PM awareness, understanding, and educational

needs concerning PM would differ significantly between the two groups; and that a brief introduction to PM would improve PM awareness in both groups.

## METHODS

### Data collection

We analyzed part of the dataset from an online survey conducted by the Korean Psychosomatic Society called "Awareness and Demand Survey on PM." Overall, 101 doctors (age range of 20–60 years) were recruited—between May 1 and June 30, 2023—via bulletin advertisements in medical academic conferences and hospitals to which board members of the Korean Psychosomatic Society are affiliated. Data were collected from 100 general public recruited by the online survey company Macromill Embrain Co., Ltd. (Seoul, Korea; www.embrain.com). The eligibility criteria for the general public participants were 1) aged 20–59 years and 2) not being a healthcare professional.

### Questionnaire organization

In November 2022, the Korean Psychosomatic Society conducted focused group interviews (FGIs) to prepare a questionnaire for an online survey. The FGIs were conducted face-to-face, with each group consisting of five PM specialists, five psychiatrists, five non-psychiatric doctors, six nurses, and six non-medical personnel. Based on the words most frequently mentioned in the FGIs, we extracted 36 keywords regarding PM (**Fig. 1**) that were used in the other portions of the study.

To identify participants' educational needs concerning PM, the interview participants were asked to freely discuss the educational topics in the PM field they wanted to know more about. We organized these topics, as well as topics in key related areas recommended by PM experts, yielding a total of 26 educational topics.

### Questionnaires

This online survey was developed to identify the differences between doctors and the general public regarding PM awareness, knowledge of PM-related keywords, and educational needs concerning PM.

#### *Sociodemographic characteristics*

Data were collected regarding participants' sociodemographic characteristics, including age, sex, years of education, marital status, and occupation. For doctors, we additionally collected information on healthcare organization type (clinics, hospitals, general hospitals, and tertiary care centers), specialty (medicine, surgery, psychiatry), and whether they were specialists or residents.

#### *Awareness and experience*

PM awareness was assessed by the yes-or-no item, "Have you heard of PM?." PM understanding was then assessed by the item "Do you understand what PM means?" (1, *I have no idea*; 4, *I have a very good idea*). Doctors responded to other yes-or-no items about their PM experiences in practicing in related fields.

#### *Keywords*

To identify participants' PM awareness and the most efficient keywords for related education and explanations, respondents chose 10 keywords (out of 36) they thought described PM.


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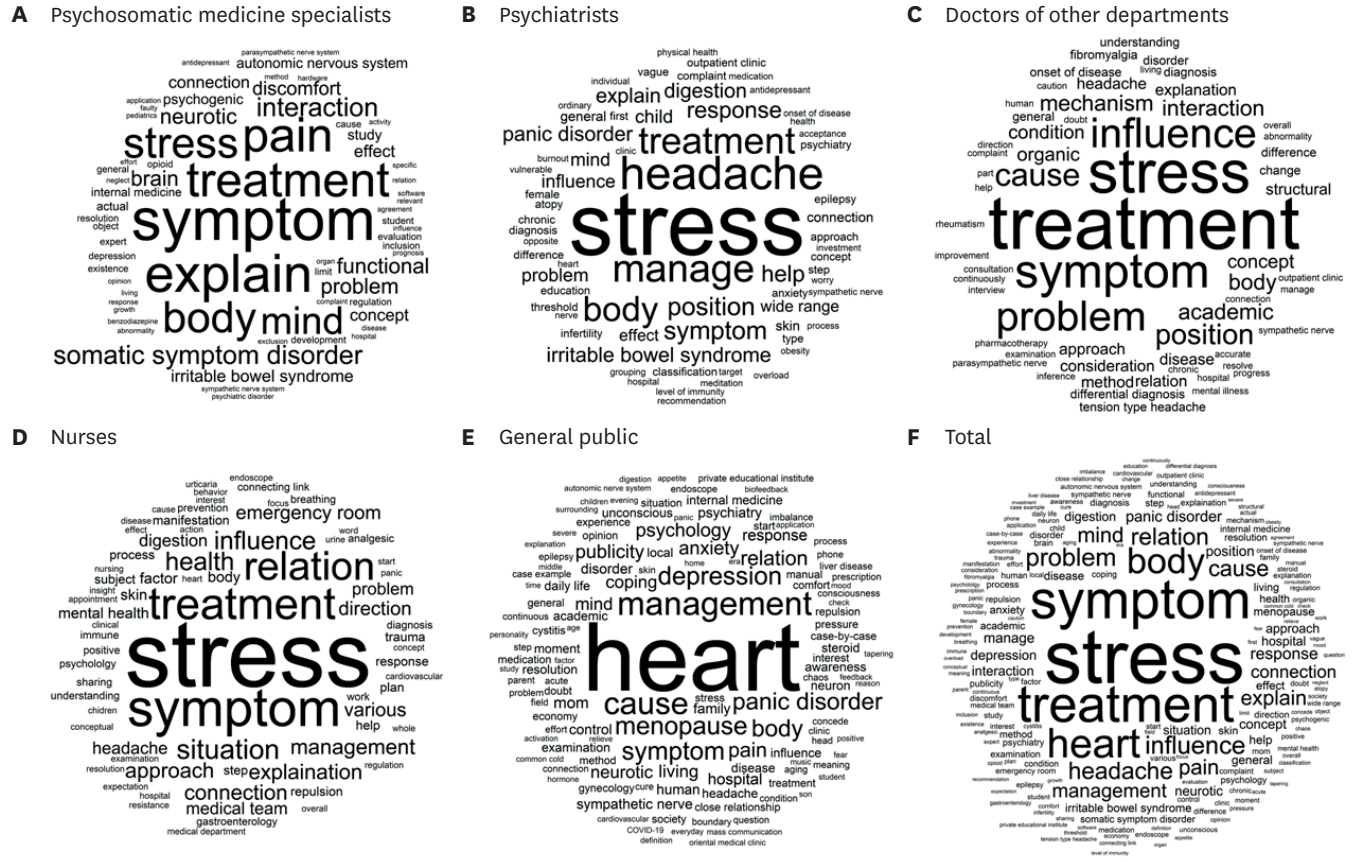


**Fig. 1.** Keywords representing psychosomatic medicine based on the focused group interviews.

Then, they read a brief introduction to PM (written by the five PM specialists) for 30 seconds or more (**Supplementary Table 1**). Afterwards, participants again chose 10 keywords (out of 36) that described PM.

*Educational topics concerning PM*

A list of 26 PM-related topics was provided and participants selected five topics in the PM field about which they wanted to get to know more about.

## Statistical analyses

Sociodemographic characteristics were analyzed using descriptive statistics. To compare PM awareness and understanding among doctors by specialty, $\chi^2$ test and independent variable analysis were used. Differences in keyword selection frequency between both groups were compared using chi-square tests. To compare changes, in both groups, in keyword selection frequency before and after reading the PM introduction, chi-square tests were conducted. Educational needs concerning PM in each group were analyzed using descriptive statistics. SPSS version 28.0 (IBM Corp., Armonk, NY, USA) was used for data processing and analysis, with a $P < 0.05$ implying statistical significance.

## Ethics statement

The study protocol was approved by the Institutional Review Board of the Chung-Ang University (No. 1041078-20230515-HR-137). The requirement for informed consent from participants was waived because only de-identified, secondary data were retrieved and used.


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# RESULTS

## Sociodemographic characteristics

Compared with the general public, doctors had significantly more men, higher education, and more people living with a partner (**Table 1**).

## PM awareness

Doctors reported significantly higher PM awareness and understanding (vs. the general public; **Table 1**), and 35.6% of doctors reported PM experience. Regarding specialty, 57.1% of internal medicine doctors, 46.7% of surgical doctors, and 100.0% of psychiatrists reported PM awareness, and this difference was significant (**Table 2**). PM understanding was significantly higher among psychiatrists (vs. internal medicine and surgical doctors). PM experience differed significantly between psychiatrists (76.7%), internal medicine doctors (10.7%), and surgical doctors (none).

**Table 1.** Characteristics of the study participants (N = 201)

| Variables | Doctors (n = 101) | General public (n = 100) | Statistics | |
|---|---|---|---|---|
| | | | $t/\chi^2$ | *P* |
| Demographic factors | | | | |
| Age, yr | 40.95 ± 9.52 | 39.61 ± 11.05 | 0.92 | 0.358 |
| Sex, male | 66.3 | 50.0 | 5.51 | 0.019 |
| Education | | | | < 0.001 |
| High school or less | 0.0 | 19.0 | 87.19 | |
| College | 29.7 | 73.0 | | |
| Graduate degree or higher | 70.3 | 8.0 | | |
| Marriage | 71.3 | 46 | 13.25 | < 0.001 |
| Occupational factors | | | | |
| Occupation | 100 | 79 | 23.02 | < 0.001 |
| Healthcare organization type | | | | - |
| Clinics | 28.7 | - | - | |
| Hospitals | 12.9 | | | |
| General hospitals | 18.8 | | | |
| Tertiary care centers | 39.6 | | | |
| Specialty | | | | - |
| Medicine | 27.7 | - | - | |
| Surgery | 29.7 | | | |
| Psychiatry | 42.6 | | | |
| Specialists | 70.3 | - | - | - |
| Residents | 29.7 | - | - | - |
| Psychosomatic medicine awareness | | | | |
| Psychosomatic medicine awareness, yes | 72.3 | 33.0 | 31.10 | < 0.001 |
| Psychosomatic medicine understanding | 2.55 ± 0.87 | 1.91 ± 0.64 | 6.01 | < 0.001 |
| Psychosomatic medicine experience, yes | 35.6 | - | - | - |

Values are presented as mean ± standard deviation or percentage.

**Table 2.** Participants' psychosomatic medicine awareness in the doctor group (N = 101)

| Psychosomatic medicine awareness/ understanding/experience | Total doctors | Specialty | | | Statistics | |
|---|---|---|---|---|---|---|
| | | Internal medicine (n = 28) | Surgery (n = 30) | Psychiatry (n = 43) | $F/\chi^2$ | *P* value[a] |
| Psychosomatic medicine awareness, yes | 72.3 | 57.1 | 46.7 | 100.0 | 29.51 | < 0.001 |
| Psychosomatic medicine understanding | 2.55 ± 0.87 | 2.18 ± 0.72 | 2.00 ± 0.79 | 3.19 ± 0.55 | 33.31 | < 0.001 |
| Psychosomatic medicine experience, yes | 35.6 | 10.7 | 0.0 | 76.7 | 55.87 | < 0.001 |

Values are presented as mean ± standard deviation or percentage.
[a]Internal medicine = surgery < psychiatry.


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## Keywords selected before and after PM introduction

The frequently-selected PM-related keywords before and after the brief introduction to PM is shown in **Figs. 2** and **3**.

Before PM introduction, doctors chose the words of "digestion," "functional," "irritable bowel syndrome," "pain," "psychogenic," and "somatic symptom disorder" significantly more (vs. general public). The general public chose the words of "brain," "cause," "influence," "mind," "panic disorder," "problem," "psychology," "response," and "treatment" significantly more (vs. doctors; **Table 3**).

After PM introduction, doctors chose the words of "autonomic nervous system," "concept," "functional," "pain," "psychogenic," and "somatic symptom disorder" significantly more (vs. general public). The general public group chose the words of "anxiety," "mind," "panic disorder," "psychology," and "treatment" significantly more (vs. doctors; **Table 4**).

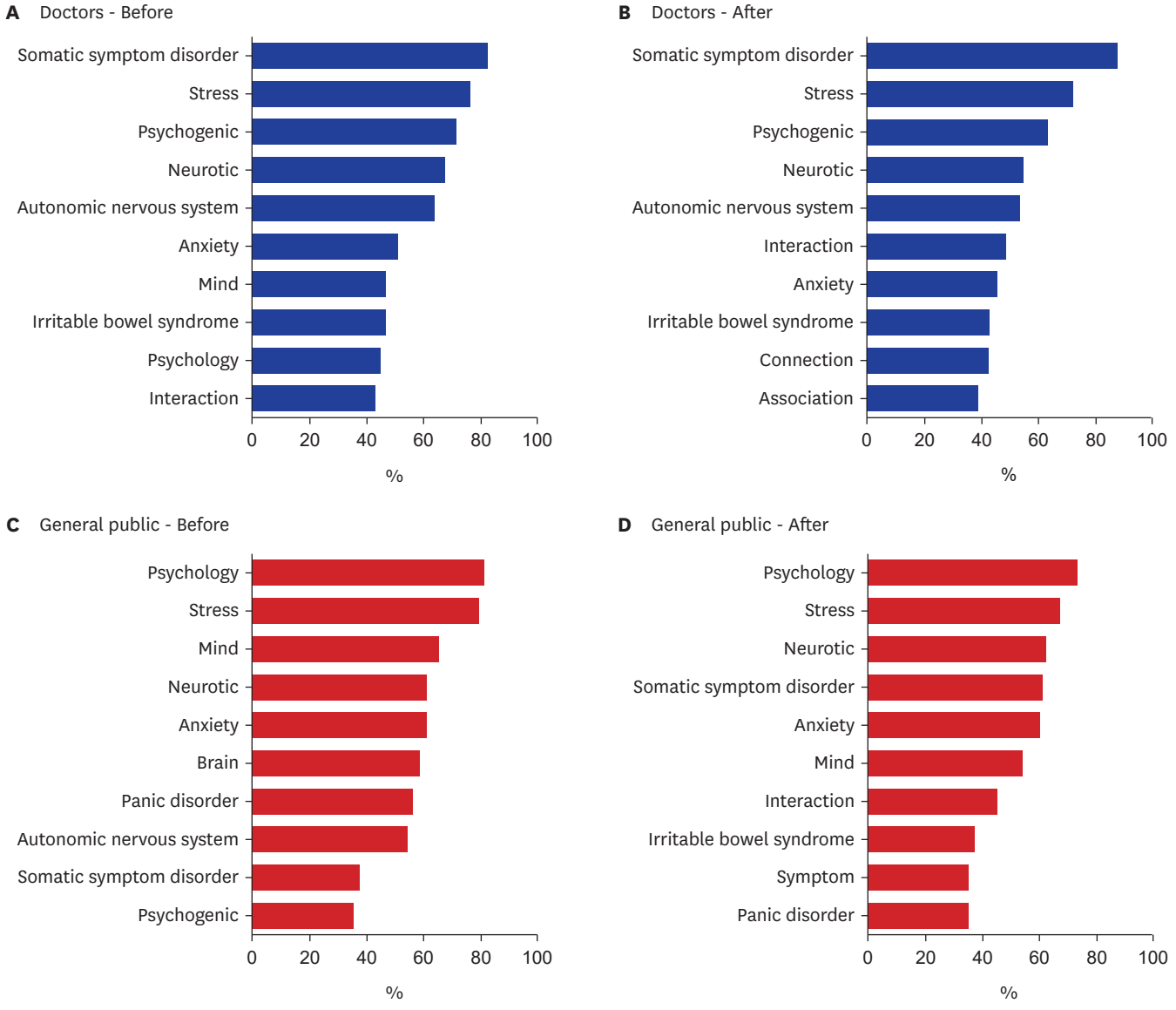


**Fig. 2.** Charts of keywords representing psychosomatic medicine based on survey results.


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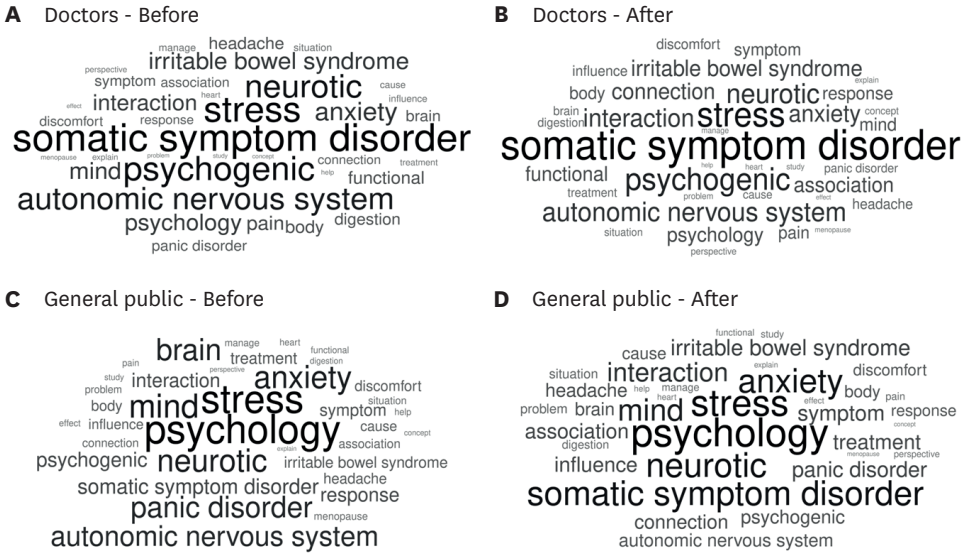


**Fig. 3.** Word clouds for words representing psychosomatic medicine based on survey results.

**Table 3.** Group differences in the frequency of psychosomatic-related keywords selected before the brief introduction to psychosomatic medicine

| Keywords | Doctors (n = 101) | General public (n = 100) | $\chi^2$ | *P* value |
|---|---|---|---|---|
| Anxiety | 50.5% | 61.0% | 2.25 | 0.134 |
| Association | 21.8% | 17.0% | 0.74 | 0.391 |
| Autonomic nervous system | 63.4% | 54.0% | 1.82 | 0.178 |
| Body | 30.7% | 23.0% | 1.51 | 0.219 |
| Brain | 26.7% | 58.0% | 20.13 | < 0.001 |
| Cause | 10.9% | 21.0% | 3.84 | 0.050 |
| Concept | 2.0% | 6.0% | 2.13 | 0.145 |
| Connection | 19.8% | 16.0% | 0.49 | 0.482 |
| Digestion | 27.7% | 8.0% | 13.29 | < 0.001 |
| Discomfort | 21.8% | 22.0% | 0.001 | 0.970 |
| Effect | 3.0% | 9.0% | 3.25 | 0.071 |
| Explain | 6.9% | 2.0% | 2.86 | 0.091 |
| Functional | 30.7% | 9.0% | 14.84 | < 0.001 |
| Headache | 28.7% | 23.0% | 0.86 | 0.355 |
| Heart | 6.9% | 9.0% | 0.29 | 0.588 |
| Help | 5.0% | 10.0% | 1.86 | 0.173 |
| Influence | 10.9% | 21.0% | 3.84 | 0.050 |
| Interaction | 42.6% | 34.0% | 1.56 | 0.211 |
| Irritable bowel syndrome | 46.5% | 24.0% | 11.17 | 0.001 |
| Manage | 11.9% | 11.0% | 0.04 | 0.844 |
| Menopause | 5.0% | 12.0% | 3.23 | 0.073 |
| Mind | 46.5% | 65.0% | 6.94 | 0.008 |
| Neurotic | 67.3% | 61.0% | 0.88 | 0.350 |
| Pain | 35.6% | 10.0% | 18.72 | < 0.001 |
| Panic disorder | 23.8% | 56.0% | 21.8 | < 0.001 |
| Perspective | 6.9% | 5.0% | 0.33 | 0.564 |
| Problem | 3.0% | 13.0% | 6.9 | 0.009 |
| Psychogenic | 71.3% | 35.0% | 26.58 | < 0.001 |
| Psychology | 44.6% | 81.0% | 28.54 | < 0.001 |
| Response | 19.8% | 34.0% | 5.16 | 0.023 |
| Situation | 12.9% | 12.0% | 0.04 | 0.852 |
| Somatic symptom disorder | 82.2% | 37.0% | 42.63 | < 0.001 |
| Stress | 76.2% | 79.0% | 0.22 | 0.639 |
| Study | 3.0% | 8.0% | 2.46 | 0.117 |
| Symptom | 24.8% | 28.0% | 0.27 | 0.601 |
| Treatment | 8.9% | 26.0% | 10.2 | 0.001 |


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**Table 4.** Group differences in the frequency of psychosomatic medicine-related keywords selected after the brief introduction to psychosomatic medicine

| Words | Doctors (n = 101) | General public (n = 100) | $\chi^2$ | *P* value |
|---|---|---|---|---|
| Anxiety | 45.5% | 60.0% | 4.21 | 0.040 |
| Association | 38.6% | 34.0% | 0.46 | 0.496 |
| Autonomic nervous system | 53.5% | 27.0% | 14.63 | < 0.001 |
| Body | 28.7% | 25.0% | 0.35 | 0.553 |
| Brain | 16.8% | 28.0% | 3.61 | 0.058 |
| Cause | 14.9% | 25.0% | 3.25 | 0.072 |
| Concept | 10.9% | 2.0% | 6.57 | 0.010 |
| Connection | 42.6% | 31.0% | 2.89 | 0.089 |
| Digestion | 16.8% | 14.0% | 0.31 | 0.578 |
| Discomfort | 21.8% | 23.0% | 0.04 | 0.836 |
| Effect | 3.0% | 7.0% | 1.73 | 0.189 |
| Explain | 5.9% | 6.0% | 0 | 0.986 |
| Functional | 36.6% | 8.0% | 23.71 | < 0.001 |
| Headache | 21.8% | 29.0% | 1.38 | 0.240 |
| Heart | 5.9% | 7.0% | 0.09 | 0.760 |
| Help | 3.0% | 7.0% | 1.73 | 0.189 |
| Influence | 21.8% | 33.0% | 3.18 | 0.074 |
| Interaction | 48.5% | 45.0% | 0.25 | 0.618 |
| Irritable bowel syndrome | 42.6% | 37.0% | 0.65 | 0.420 |
| Manage | 5.9% | 12.0% | 2.26 | 0.133 |
| Menopause | 4.0% | 3.0% | 0.14 | 0.710 |
| Mind | 31.7% | 54.0% | 10.22 | 0.001 |
| Neurotic | 54.5% | 62.0% | 1.18 | 0.278 |
| Pain | 29.7% | 12.0% | 9.53 | 0.002 |
| Panic disorder | 17.8% | 35.0% | 7.64 | 0.006 |
| Perspective | 9.9% | 9.0% | 0.05 | 0.827 |
| Problem | 7.9% | 17.0% | 3.8 | 0.051 |
| Psychogenic | 63.4% | 29.0% | 23.87 | < 0.001 |
| Psychology | 36.6% | 73.0% | 26.82 | < 0.001 |
| Response | 31.7% | 23.0% | 1.91 | 0.167 |
| Situation | 13.9% | 17.0% | 0.38 | 0.538 |
| Somatic symptom disorder | 88.1% | 61.0% | 19.52 | < 0.001 |
| Stress | 72.3% | 67.0% | 0.66 | 0.416 |
| Study | 5.9% | 10.0% | 1.13 | 0.288 |
| Symptom | 29.7% | 35.0% | 0.64 | 0.422 |
| Treatment | 17.8% | 33.0% | 6.11 | 0.013 |

### Keywords selection differences before and after PM introduction

Among doctors after PM introduction (vs. before), “association,” “concept,” “connection,” and “influence” were significantly more frequently selected, whereas “mind” was significantly less frequently selected (**Table 5**).

Among the general public after PM introduction (vs. before), “association,” “connection,” “irritable bowel syndrome,” and “somatic symptom disorder” were significantly more frequently selected, whereas “autonomic nervous system,” “brain,” “menopause,” and “panic disorder” were significantly less frequently selected (**Table 5**).

### Top-10 PM topics most in need

Among doctors, the most selected topics were “stress and chronic pain,” “mental health issues in cancer patients,” and “stress and gastrointestinal disorders.” Among the general public, they were “how to self-manage stress,” “stress and chronic pain,” and “medical treatments for stress” (**Table 6**).


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**Table 5.** Keywords for which there was a significant change in frequency of selection after the brief introduction to psychosomatic medicine by group

| Words | Before | After | $\chi^2$ | *P* value |
|---|---|---|---|---|
| Doctors (n = 101) | | | | |
| Association | 21.8% | 38.6% | 6.79 | 0.009 |
| Concept | 2.0% | 10.9% | 6.66 | 0.010 |
| Connection | 19.8% | 42.6% | 12.2 | < 0.001 |
| Influence | 10.9% | 21.8% | 4.38 | 0.036 |
| Mind | 46.5% | 31.7% | 4.68 | 0.031 |
| General public (n = 100) | | | | |
| Association | 17.0% | 34.0% | 7.61 | 0.006 |
| Autonomic nervous system | 54.0% | 27.0% | 15.13 | < 0.001 |
| Brain | 58.0% | 28.0% | 18.36 | < 0.001 |
| Connection | 16.0% | 31.0% | 6.26 | 0.012 |
| Irritable bowel syndrome | 24.0% | 37.0% | 3.99 | 0.046 |
| Menopause | 12.0% | 3.0% | 5.84 | 0.016 |
| Panic disorder | 56.0% | 35.0% | 8.89 | 0.003 |
| Somatic symptom disorder | 37.0% | 61.0% | 11.53 | 0.001 |

**Table 6.** Top 10 psychosomatic medicine topics which participants were reportedly in need of by group

| Ranking of needs | Topics | |
|---|---|---|
| | Doctors (n = 101) | General public (n = 100) |
| 1 | Stress and chronic pain (45.5%) | How to self-manage stress (41.0%) |
| 2 | Mental health issues in cancer patients (37.6%) | Stress and chronic pain (39.0%) |
| 3 | Stress and gastrointestinal disorders (34.7%) | Medical treatments for stress (35.0%) |
| 4 | Somatic symptom disorders (34.7%) | Differentiation between common physical and psychosomatic illnesses (30.0%) |
| 5 | Stress and headaches (33.7%) | Occupational (workplace) stress (30.0%) |
| 6 | Differentiating between common physical and psychosomatic illnesses (29.7%) | Stress and gastrointestinal disorders (29.0%) |
| 7 | General psychology and counseling techniques for patients with psychosomatic disorders (24.8%) | Stress and headaches (26.0%) |
| 8 | Illness anxiety disorders (hypochondriasis) (23.8%) | Illness anxiety disorders (hypochondriasis) (26.0%) |
| 9 | Maternal mental health issues including postpartum depression (22.8%) | Screening and assessment methods for psychosomatic disorders (26.0%) |
| 10 | General management for psychosomatic disorders (21.8%) | Assessment methods to measure stress (26.0%) |

## DISCUSSION

To the best of our knowledge, this was the first study to assess and compare PM awareness between general public and medical doctors, and examine the effectiveness of a short-term educational intervention in improving PM awareness. As initially hypothesized, PM awareness, understanding, and educational needs concerning PM differed significantly between the two groups. The doctor group reported a significantly higher PM awareness and understanding (vs. general public group), and there were significant differences between the groups regarding the frequently-selected PM-related keywords. Additionally, in line with the initial hypothesis, the brief introduction to PM improved PM awareness in both groups, albeit to varying degrees. In each of the two groups, there was a significant difference in the frequently-selected PM-related keywords between before and after the brief introduction to PM. The two groups also diverged in their educational needs concerning PM.

Only one-third of participants in the general public group were reportedly aware of PM, whereas more than 70% of doctors had such awareness. No prior research has examined the general public's awareness of PM; however, there is evidence showing a lack of scientific knowledge among the general public.[10] Furthermore, in a study on the public awareness of stress, which is an important axis of PM, there was a lack of public understanding of the science of stress despite the extensive advances in this field over the past few decades.[10]


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When examining PM awareness, understanding, and experience by doctors' specialty, psychiatrists had significantly higher scores than internal medicine and surgical doctors. Excluding psychiatrists, approximately 50% of the doctors in our sample were aware of PM. This is not a high figure, considering that nonpsychiatric physicians are the first points of contact for many psychiatric patients.[9] Moreover, primary care physicians' psychiatric condition management often falls short of the recommended guidelines[9]; therefore, providing them with psychiatric training, especially about PM, could improve psychiatric condition management.

In this study, before a brief introductory intervention for PM, the general public group frequently chose some terms that did not specifically describe PM (e.g., "psychology," "stress," "mind," "anxiety," and "brain"). Among doctors, PM-related keywords were significantly better recognized (e.g., "somatic symptom disorder," "stress," "psychogenic," "neurotic," "autonomic nervous system," and "irritable bowel syndrome"). There was a significant difference between both groups regarding PM understanding, with doctors choosing more PM-specific words (e.g., "digestion," "functional," "irritable bowel syndrome," "pain," "psychogenic," and "somatic symptom disorder"), including symptoms and/or disease names. The words selected by the doctors strongly correlate with the educational guidelines from American and European academic societies regarding consultation-liaison psychiatry and PM.[11,12] Thus, doctors have a fairly-accurate basic conceptualization of PM, which is expected because they have been introduced to it in their respective medical schools and during residency training.[13,14] Meanwhile, the general public's frequently-selected PM-related keywords (e.g., "brain," "cause," "influence," "mind," "panic disorder," "problem," "psychology," "response," and "treatment") indicate a vaguer idea of PM, suggesting the need for targeted PM education.

Then, we administered the brief introduction to PM and asked participants to select the keywords once more; this served to grasp which keywords should be emphasized in separate educational programs for doctors and general public to have the greatest impact on program participants. In the doctor group, four words (i.e., "association," "concept," "connection," and "influence") were selected significantly more often after the brief introduction, whereas the word "mind" was selected significantly less often. This shift mirrors the evolution of PM from its historical roots to its modern framework. The concept of psychogenic diseases—physical illnesses believed to be caused by psychological factors (or the "mind") such as peptic ulcers and cardiac neuroses—defined PM in its early stages, from 1930 to 1960.[15] Then, in the 1970s, George Engel developed a multifactorial disease model that would later be known as the "biopsychosocial" model[15]; it posits that disease results from interactions ("association," "connection," and "influence") at the cellular, tissue, organismal, interpersonal, and environmental levels. That is, early PM concepts included the notion of psychogenicity, and the field's development lead to a greater emphasis on mind–body interactions and holism.[16]

Medical school curricula often vary according to the extent to which they cover PM-specific topics, and the nomenclature used to refer to the field is divergent.[5] In addition, there exists a considerable variation in how residents learn PM during training.[17] Based on our findings, it may be that the effect of education on PM awareness is powerful, seeing that a brief introduction to PM led to changes in the doctor group toward a greater alignment with the contemporary theory on PM. These remarks provide support for a greater emphasis on securing appropriate education and training curricula for PM in medical schools and

residency training hospitals. Corroborating, nonpsychiatric resident participants of a previous study reported a significant increase in comfort regarding their decision-making abilities after watching a 15-minute psychiatry educational video.[9] Simply providing a short education intervention may hold the potential of improving doctors' confidence in their decision-making. Furthermore, such education may lead to an increase in the referral to psychiatric consultation for patients experiencing psychosomatic symptoms. Psychiatric education for nursing staff has reduced refusal to psychiatric consultation in the realm of consultation-liaison psychiatry.[18]

The general public group also showed an overall improvement in perception after the brief introduction to PM. Regarding keyword selection changes from before to after the introduction in this group, there was a significant increase for "association," "connection," "irritable bowel syndrome," and "somatic symptomatic disorder"—the latter two being representative illnesses of PM. Although we cannot conduct comparisons with past literature owing to a dearth of past similar research, we can infer from our findings that a brief introduction to PM may change the general public's perception of PM. Meanwhile, a greater understanding of PM among the general public might prevent people from misidentifying and mismanaging their own psychosomatic symptoms and get appropriate treatment for it. Providing a biogenetic explanation for mental disorders through public education can promote the use of mental health services among the population.[19] Another study about stroke-related public education has shown that public education is effective in increasing awareness of the warning signs and overall need for prompt treatment.[20]

Regarding the top-10 PM topics about which participants reportedly needed to learn more, "stress and chronic pain," "stress and gastrointestinal disorders," and "stress and headaches" were commonly highly ranked in both groups. These findings are consistent with the high frequency of these conditions, which showed prevalences revolving around 20–30% for chronic pain, 40% for functional gastrointestinal disorders, and 52% for headaches.[21-24] The demand for pain-related education in our sample was also particularly high, resembling the findings of a past survey on which topics should be included in psychiatry resident education in PM, where pain-related education was ranked among the top five.[17]

Moreover, among the general public, seven of the top-10 PM topics were related to stress, indicating their implicit awareness of the connection between stress and psychosomatic symptoms and high interest in stress management. This is not surprising given the public interest in mental health and psychological well-being. This result might also be linked to the general public's tendency to relate stress to its deleterious effects on health, and to try to eliminate it from their lives.[10]

Among doctor participants, there was a high demand for education on more specific diseases and conditions which they might encounter in their clinical practice, including "mental health issues in cancer patients" and "maternal mental health issues including postpartum depression." A past study with nonpsychiatric residents showed a correlation of level of comfort regarding own decision-making on psychiatric topics with their medical specialty-specific training experience.[9] This shows that doctors' educational needs regarding PM may be related to one's training and clinical experience in own medical specialty. The doctor participants also highly demanded education on primary differential diagnosis and psychosomatic disorder management (e.g., "differentiating between common physical and psychosomatic disorders," "general psychology and counseling techniques for patients with


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psychosomatic disorders," "general management for psychosomatic disorders"). It may be that nonpsychiatric doctors have less clinical and educational experience with general psychiatric topics. Therefore, they may perceive a need for didactic training that can often only be experienced in a psychiatric residency. If we combine these discussions with our survey results, we may infer that doctors have a much better basic concept of PM than the general public, and accordingly want more practical and in-depth education about PM. When creating PM educational materials for doctor training, topics high in demand among our doctor participants could be prioritized.

This study has several limitations. First, the sample size was relatively small, and the doctor sample was not perfectly balanced regarding age, sex, region, and healthcare organization type. Second, there may be bias in our results because of a high proportion of doctors from tertiary care centers and psychiatrists, all of whom have a relatively high PM awareness. Third, the nature of the Korean healthcare delivery system may limit finding generalizability. In most countries, GPs are the first point of contact and management for patients with psychosomatic symptoms, who then refer these patients to psychiatrists when necessary. However, in Korea, where primary care is specialist-oriented, 92.6% of primary care physicians are board-certified specialists, and patients can visit specialized clinics or hospitals without referral from a GP.[25] Therefore, the extrapolation of the results of this study to other countries should be done with caution. Overcoming these limitations will require studies with larger, stratified samples and cross-country comparisons. Last, although using keywords is a simple and effective way to assess perceptions of PM in both groups, it alone may not precisely capture the participants' understanding of PM fully. Keywords such as "help" or "explain" do not refer to PM on their own, but only become relevant when used in combination with other keywords.

In this study, we assessed and compared PM awareness and understanding, knowledge of PM-related keywords, and educational needs concerning PM among two separate samples of doctors and the general public. Doctors had a better awareness and understanding of PM, whereas the general public had only a vague understanding of PM, emphasizing the need for more education in the general population. Furthermore, even a brief introduction to PM significantly improved the awareness of both groups. This emphasizes the powerful impact of education in improving PM awareness and understanding. Regarding education for PM, we recommend focusing on stress education for the general public, and differential diagnosis, treatment, and psychotherapy for psychosomatic disorders for doctors.

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## SUPPLEMENTARY MATERIAL

**Supplementary Table 1**
Brief introduction about psychosomatic medicine

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