Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Public awareness of mibyou and preferences for disclosure and treatment among adults in Japan

Yoshihiko Iijima

yoshihiko.iijima@fujita-hu.ac.jp

Fujita Health University

Ayako Kamisato

National Center for Child Health and Development

Research Article

Keywords: mibyou, pre-symptomatic disease, ELSI, survey, public awareness

Posted Date: November 18th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11455116/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Abstract

Introduction: Mibyou (pre-symptomatic disease) is “a state between health and illness in which symptoms may occur without disease progression or abnormal test results may occur without symptoms.” This study examined public awareness of *mibyou* to inform ethical, legal, and social considerations related to its use in early disease prediction and prevention.

Methods

We conducted an anonymous online survey among 1,020 participants (510 men and 510 women) to assess perceptions of *mibyou* and preferences if identified as being in a *mibyou* state.

Results

Most participants were unaware of mibyou (52.1%); 17.9% had seen or heard of it, and 30% thought they might have encountered it before. Overall, 50.7% reported they would feel relieved if informed that they were in a mibyou state, whereas 47.6% expressed that they would feel anxious. Most preferred to be informed under all circumstances (46.4%) or if disclosure could help prevent disease or delay disease progression (48.6%). However, 4.5% preferred not to be informed under any circumstances. Furthermore, 49.5% preferred to start treatment immediately, whereas 49.1% preferred to monitor their condition before deciding.

Conclusions

Limited awareness of *mibyou* highlights the need for public awareness of the concept. Knowledge of a *mibyou* state cannot be reversed; therefore, disclosure should respect individuals’ right not to know and their right to make informed treatment decisions.

Introduction

The Aihara Moonshot Project is our collaborative research initiative involving experts from diverse disciplines, such as science, the humanities, and the social sciences, centered on the concept of “*mibyou*” (pre-symptomatic disease), with the goal of enabling disease prediction and prevention at an extremely early stage. Aihara et al. have developed mathematical analysis techniques to identify the *mibyou* state.[1–4] One application of this technology was recently demonstrated in a study that, for the first time, provided scientific evidence for the preventive and preemptive effects of a traditional Chinese medicine prescription for *mibyou* preceding metabolic syndrome.[5] However, concerns have been raised that identifying *mibyou* and implementing related health and medical policies could lead to issues, such as discrimination (e.g., higher private medical insurance premiums) or excessive health consciousness due to being classified as being in a *mibyou* state. Thus, to advance disease prevention using the *mibyou* framework, it is essential to address pertinent ethical, legal, and social issues (ELSI). Accordingly, this project incorporates ELSI considerations to ensure its responsible implementation.

In Japan, the Cabinet Office's Health and Medical Strategy, approved by the Cabinet, defines *mibyou* as "a concept that encompasses the entire process of changes between mental and physical health and illness, viewing them as continuous rather than dichotomous"[6]. However, the specific state that *mibyou* represents has yet to be clearly defined. This project aims to establish a scientific definition of the currently ambiguous concept of *mibyou*, develop diagnostic criteria, and explore treatment approaches. To achieve these aims, it is essential to first define *mibyou* explicitly. Additionally, as *mibyou* research advances, addressing the associated ELSI requires an understanding of the public's awareness and perceptions of "health," "illness," and "*mibyou"* as foundational information. Therefore, we conducted a survey to examine these perspectives and report the findings in this paper.

Materials and Methods

Recruitment and sampling

This cross-sectional study was conducted in February 2023 by conducting a web-based survey among approximately 1,000 adults from the general Japanese population. The participants were recruited from a nationwide research panel maintained by INTAGE Inc., which has established privacy and panel quality management policies and extensive experience in conducting commissioned surveys for academic institutions. Its panel comprises individuals residing in Japan who have voluntarily registered to participate in survey research. Among this panel, we selected participants for our study using quota sampling to approximate the distribution of the Japanese population by sex and age.

Considering that this was an exploratory study and no prior data were available to support a formal calculation of sample size, the target sample size was set to approximately 1,000 participants. This number was considered sufficient to provide an initial overview of public awareness and attitudes toward *mibyou*. This number was also considered feasible, given the available time, budget, and survey implementation resources.

Participants were eligible for inclusion if they were aged 18–79 years, resided in Japan, were registered members of the INTAGE online research panel, and provided informed consent to participate in the survey. No additional eligibility criteria based on health status or prior knowledge of mibyou were applied. Eligible panel members received an online invitation to participate in the survey. Participants provided electronic informed consent before completing the questionnaire.

Questionnaire development and content

The questionnaire was developed by the authors, whose expertise includes medical ethics, clinical medicine, and public health. The questionnaire items were developed based on the objectives of the study and through discussions among the research team. No formal external review by experts in survey methodology or other relevant disciplines was conducted during questionnaire development. In addition, the questionnaire was not reviewed by members of the general public before the survey. The original

questionnaire was developed in Japanese. The English descriptions and questionnaire items presented in this manuscript are translations of the original Japanese version for the convenience of international readers. No cognitive interviews or pilot testing were conducted prior to the main survey.

One of the primary objectives of this study was to assess public awareness of *mibyou*. Therefore, participants were not provided with a definition of *mibyou* before answering the question regarding their awareness of the term. After responding to this question, they were provided with the following definition, based on the Japan Mibyou Association: “a state between health and illness, in which individuals may experience subjective symptoms without disease progression or exhibit no symptoms despite abnormal test results”[7]. Participants were also informed that *mibyou* is an inherently ambiguous concept. They then answered the subsequent questions regarding their perceptions, attitudes, emotional responses, and preferences concerning mibyou. This sequence was adopted to avoid influencing participants’ responses to the initial awareness question.

Questionnaire items

The questionnaire included four items. The first item identified participants’ awareness of the term *mibyou* by asking whether they had ever seen or heard of the term. The second item asked participants how they would feel if a doctor informed that they were in a *mibyou* state. The third item enquired about participants’ preferences on whether they would want to be informed if a doctor diagnosed them as being in a *mibyou* state. The final item asked participants how they would feel if their health check-up results were normal but their doctor informed them that they were in a *mibyou* state and recommended starting treatment immediately.

Data analysis

Data obtained from valid responses were summarized using descriptive statistics, particularly frequencies and percentages. We used Lyche-Epoch (INTAGE Inc., Tokyo, Japan) to determine descriptive statistics.

Ethical considerations

This study was approved by the First Research Ethics Committee of the Institute of Medical Science, the University of Tokyo (approval no. 2022-65-0125) and was conducted in accordance with the study protocol approved by that committee. Before the commencement of the survey, the participants received information about the study purpose and procedures and provided electronic informed consent. Participation was voluntary, and responses were collected anonymously.

Results

We received responses from 510 men and 510 women, totaling 1,020 respondents, ranging from 18 to 79 years of age, thereby representing all age groups. When asked whether they had ever seen or heard of the term *mibyou*, 17.9% responded “yes,” 30% stated that they felt as though they had seen it somewhere, and 52.1% answered “no.”

(Fig. 1**).**

We asked participants how they would feel if a doctor informed them that they were in a *mibyou* state. When categorized according to whether they perceived such a state as meaning that they were “sick,” 12.6% believed they were “not sick,” 66.9% thought they “could become sick,” and 18.8% felt they had “become sick.” When classified according to whether they would feel relieved or anxious upon being told they were in a *mibyou* state, 50.7% stated they would feel “relieved,” while 47.6% indicated they would feel “anxious.” Among those who believed they “could become sick,” 30.1% said they would be relieved because they had been informed early, whereas 36.8% reported that they would feel “anxious.” Among those who thought they had “become sick,” 8.0% expressed relief because of early awareness, while 10.8% stated that they would feel anxious (Table 1).

Table 1
Participants’ responses to being informed by a doctor that they were in a *mibyou* state

I would think that I was not sick and would feel relieved.	I would think that I could become sick and would feel relieved that I had been informed early.	I would think that I could become sick and would feel anxious.	I would think that I had become sick and would feel relieved that I had been informed early.	I would think that I had become sick and would feel anxious.	Other
12.6%	30.1%	36.8%	8.0%	10.8%	1.7%

When asked whether they would want to be informed if a doctor diagnosed them as being in a *mibyou* state, 46.4% responded that they would like to be informed under all circumstances, while 48.6% stated that they would like to be informed if it would help prevent illness or delay disease progression, making a total of 95%. In contrast, 4.5% answered that they would not want to be informed under any circumstances (Table 2).

Table 2
Participants’ preferences regarding whether they would want to be informed if a doctor found that they were in a *mibyou* state

I would like to be informed under all circumstances.	I would like to be informed if doing so would prevent illness or delay disease progression.	I would not like to be informed under any circumstances.	Other
46.4%	48.6%	4.5%	0.5%

When asked how they would feel if their health check-up results were normal but their doctor told them, “You are in a mibyou state, so it would be better to start treatment immediately,” 49.5% responded, “I

would like to start treatment immediately," while 49.1% expressed a preference to "monitor the condition" (Fig. 2).

(Fig. 2**).**

Discussion

The results indicated that approximately half of the participants had seen or heard of the term *mibyou*. While this was more than expected, the fact that the other half had never encountered the term suggests that it is not widely recognized. Therefore, when promoting the term, it is important to offer a clear and accessible definition and to implement efforts to enhance public awareness of the term.

Regarding how participants would feel if a doctor informed them they were in a *mibyou* state, there are several complex factors to consider. When participants were categorized according to whether they perceive it as an illness, 12.6% believed they were "not sick"; by contrast, 66.9% thought they "could become sick," and 18.8% felt they "had become sick," constituting a majority of 85.7%. When it comes to *mibyou*, many people perceive the possibility of becoming ill despite the vagueness of the concept. However, when asked whether they would feel relieved upon being told they were in a *mibyou* state, 50.7% said they would "feel relieved," while 47.6% said they would "feel anxious," showing a nearly even split in responses. It is important to distinguish between individual differences in how people perceive the connection between the "*mibyou* state" and "becoming/being sick" and the differences in how the perception of "the possibility of becoming sick" or "having become sick" influences feelings of "relief" or "anxiety."

When asked whether they would like to be informed that they were in a *mibyou* state, 95% participants answered either "I would like to be informed under all circumstances" or "I would like to be informed if doing so would prevent illness or delay disease progression," indicating that most participants would prefer to be informed. However, 4.5% responded, "I would not like to be informed under any circumstances," showing that there is still a group of people who would prefer not to know. Once someone is aware that they are in a *mibyou* state, they can never reverse this knowledge, which raises concerns similar to those surrounding "the right not to know" regarding genetic information.[8] Based on these findings, careful consideration is necessary when deciding whether to inform individuals that they are in a *mibyou* state.

When asked how they would feel if their health check-up results were normal but their doctor informed them that they were in a *mibyou* state and recommended starting treatment immediately, half of the respondents expressed that they would begin treatment immediately, while the other half preferred to monitor their condition. From the perspective of respecting individuals' right to make their own personal health decisions, considering those who may not want to begin treatment immediately is important. The optimal approach to intervening in the *mibyou* state remains a topic for future exploration.

Experts in science and medicine often view “knowing” or “being cured” as inherently beneficial. However, regardless of the medical validity of the *mibyou* state, there is a small group of individuals who “absolutely do not want to know,” and it is important to consider the potential for social disadvantages. As we advance medical research and development in the emerging field of *mibyou*, we believe it is the responsibility of ELSI researchers to thoughtfully address these concerns, guided by the principles of research ethics and the lessons of history.

In this study, we have presented simple aggregate figures from the survey. However, we aim to conduct a more detailed survey in the future, taking these results into account, along with an analysis of respondent characteristics and correlations between their responses.

Limitations

This study has several limitations. First, because the participants were recruited from an online research panel, individuals who did not use the Internet were excluded. Therefore, the participants may not be fully representative of the general population of Japan. Additionally, the use of a commercial research panel may have introduced selection bias. Second, the questionnaire was exploratory in nature and was not subjected to formal validation. Third, *mibyou* is an inherently ambiguous concept, and participants’ responses may have been influenced by how the concept was explained in the questionnaire. Fourth, responses to hypothetical scenarios may not accurately reflect participants’ actual decisions or behaviors when they receive such health information in real-world clinical settings. Fifth, this study was limited to descriptive analyses; therefore, potential differences according to participant characteristics, such as age, sex, educational background, health status, and prior knowledge of *mibyou*, were not examined. Finally, as the survey assessed awareness and perceptions of the Japanese term *mibyou* among participants in Japan, the generalizability of the findings to populations in other countries and other cultural or linguistic contexts may be limited.

Conclusions

Public awareness of *mibyou* was limited. Participants’ anticipated emotional responses to being informed that they were in a *mibyou* state were divided between relief and anxiety. While most participants expressed a preference to be informed about being in a *mibyou* state, a small proportion indicated that they would prefer not to know. Preferences regarding treatment were nearly evenly divided between those who wished to start treatment immediately and those who did not.

Declarations

Funding: This work was supported by the Japan Agency for Medical Research and Development (AMED) Comprehensive Development Project for Measures for People with Disabilities (Mental Disorders), “Research and Development on De-identification Methods for Personal Information and Establishment of Data Processing Technology for Accumulation and Utilization of Data Collected from Diverse Sources

and on Assurance of Data Quality," and by the Japan Science and Technology Agency Moonshot Research and Development Program (grant no. JPMJMS2021).

Competing Interest: The authors declare no competing interests.

Author Contributions: Yoshihiko Iijima: conceptualization, methodology, investigation, formal analysis, writing – original draft, and writing – review and editing. Ayako Kamisato: conceptualization, methodology, questionnaire development, interpretation of data, and writing – review and editing. Both authors approved the final version of the manuscript.

Ethical Approval and accordance

This study was approved by the Research Ethics Committee of the Institute of Medical Science, the University of Tokyo (approval no. 2022-65-0125) in accordance with Japan's Ethical Guidelines for Medical and Biological Research Involving Human Subjects and was conducted in accordance with the study protocol approved by that committee.

Consent to participate

All participants provided electronic informed consent before completing the survey. Participation was voluntary, and responses were collected anonymously.

Consent to publish

Not applicable.

Data availability

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Acknowledgments: This study is an updated version of the presentation "Report on a general public survey on perceptions of 'health' and 'disease,'" delivered at the 8th Research Ethics Forum, "Session 4: Moonshot Mibyou DB and ELSI Issues." The authors extend their gratitude to Professor Keiichi Koizumi (Toyama University) for participating as a presenter and sharing his extensive knowledge on mibyou during the session.

References

1. Aihara K, Liu R, Koizumi K, Liu X, Chen L. Dynamical network biomarkers: Theory and applications. Gene. 2022;808:145997. 10.1016/j.gene.2021.145997.
2. Chen L, Liu R, Liu ZP, Li M, Aihara K. Detecting early-warning signals for sudden deterioration of complex diseases by dynamical network biomarkers. Sci Rep. 2012;2:342. 10.1038/srep00342.

3. Liu R, Wang X, Aihara K, Chen L. Early diagnosis of complex diseases by molecular biomarkers, network biomarkers, and dynamical network biomarkers. Med Res Rev. 2014;34(3):455–78. 10.1002/med.21293.
4. Liu X, Liu R, Zhao XM, Chen L. Detecting early-warning signals of type 1 diabetes and its leading biomolecular networks by dynamical network biomarkers. BMC Med Genomics. 2013;6(Suppl 2):S8. 10.1186/1755-8794-6-S2-S8.
5. Koizumi K, Oku M, Hayashi S, Inujima A, Shibahara N, Chen L, Igarashi Y, Tobe K, Saito S, Kadowaki M, Aihara K. Suppression of dynamical network biomarker signals at the predisease state (mibyou) before metabolic syndrome in mice by a traditional Japanese medicine (kampo formula) bofutsushosan. Evid. Based Complement Alternat Med. 2020;2020:9129134. 10.1155/2020/9129134.
6. Cabinet Secretariat, Government of Japan [Internet]. Health and medical strategy [Kenko-Iryo senryaku]. 2014. [cited August 28, 2026] Available from: https://www.cas.go.jp/jp/seisakukaigi/kenkouiryou/senryaku/index.html. Japanese.
7. Japan Mibyou Association. What is mibyou? Japan; n.d. [cited August 20, 2026] Available from: https://j-mibyou.or.jp/mibyotowa.htm. Japanese.
8. Ri I, Muto K. The right not to know in the era of genomic medicine. Jpn J Health Med Sociol. 2018;29(1):72–82. 10.18918/jshms.29.1_72.

Figures

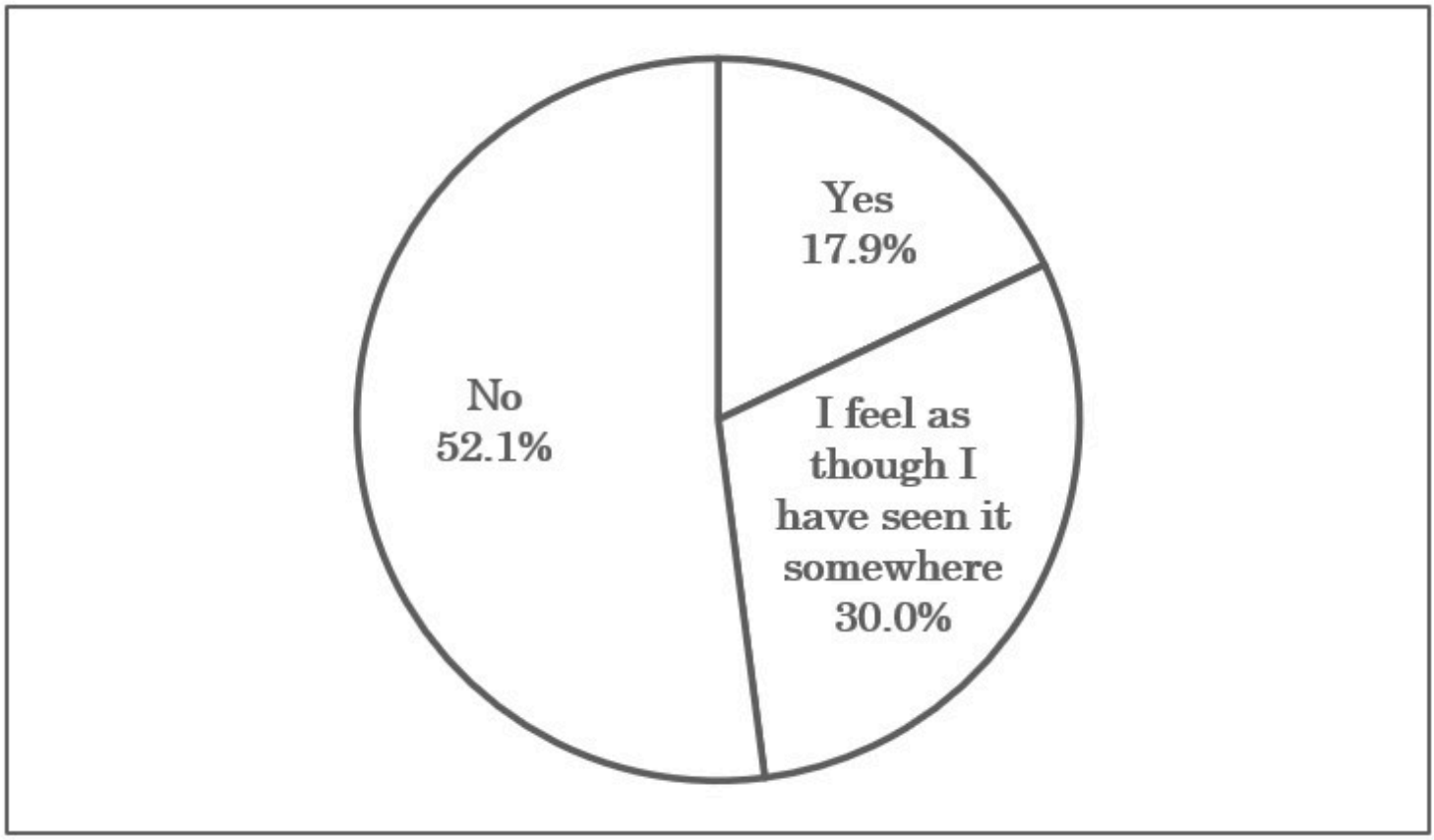


Figure 1

Participants' responses regarding whether they had ever seen or heard of the term *mibyou*

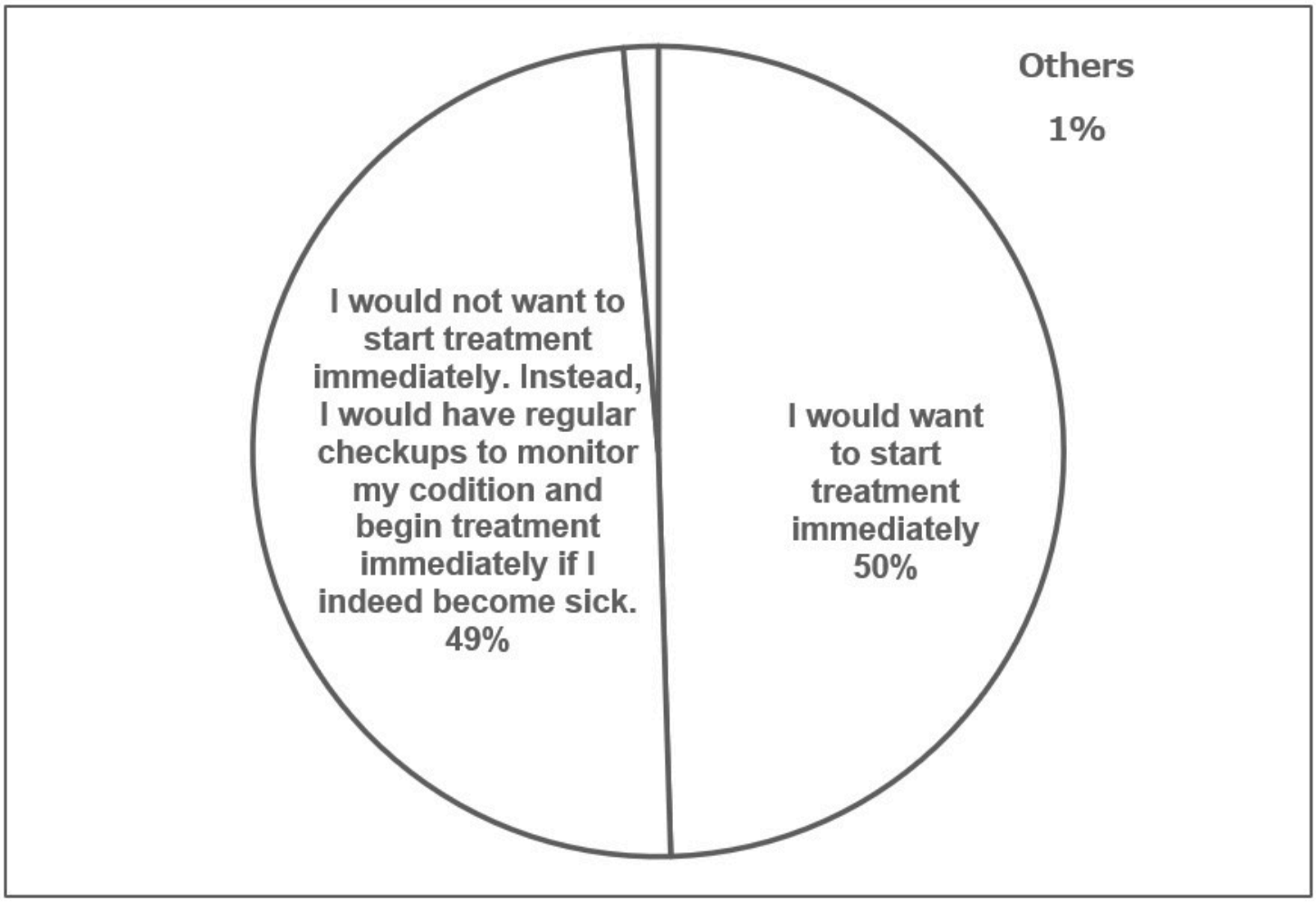


Figure 2

Participants' responses regarding how they would feel if their health check-up results were normal but their doctor informed them that they were in a *mibyou* state and recommended starting treatment immediately