

Key Components in Assessing Mental Capacity of Patients with Anorexia Nervosa: A Study from Three Countries

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Research Article

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Abstract

Background: Patients with anorexia nervosa (AN) often refuse treatment despite their extremely low nutritional status. This study investigates the assessment methods of mental capacity for patients with anorexia nervosa (AN) refusing treatment by physicians in Japan, the United Kingdom (UK), and the United States (US) and identifies key points for assessment.

Method: A questionnaire survey using vignette cases was conducted on physicians (Japan, n = 53; UK, n = 85; US, n = 85) who treated eating disorders.

Results: A total of 23% of physicians in Japan, 32% in the UK, and 35% in the US rated the patients with AN as lack of decision-making capacity. Physicians who rated patients with AN as having impaired mental capacity placed significantly more emphasis on the “level of pathological values” when assessing their mental capacity. On the other hand, physicians who assessed patients with AN as having full mental capacity placed significantly more weight on “ability to express a choice or preference.”

Conclusion: It may be necessary to add the “level of psychopathological values” to the assessment of mental capacity in relation to obesity fears and emotional disturbances in patients with AN, since emotions caused by psychopathological values strongly influence decision making. By considering the “level of psychopathological values”, it may be feasible to reflect the actual situation in the assessment of mental capacity when refusing treatment in AN, thus making it more likely to overcome ethical dilemmas.

Plain English Summary

This study investigates the method of assessment for mental capacity in Japan, the UK, and the US when patients with anorexia nervosa refuse treatment. Approximately one-third of clinicians that assessed patients with AN declared that the patients showed impaired decision-making capacity when refusing treatment. Clinicians who rated patients as losing decision-making ability tended to focus on the “level of psychopathological values” when assessing mental capacity.

Background

Patients with anorexia nervosa (AN) often refuse treatment despite their extremely low nutritional status, which requires immediate treatment. Informed consent must be obtained from the patient before performing therapeutic actions. Therefore, treatment refusal by a patient with AN is an ethical dilemma for physicians. For example, if a patient refuses treatment even when it is necessary, prioritizing the protection of the patient's life can infringe the patient's self-determination. Legal disputes and ethical debates have been raised on whether coercive treatment should be administered to patients with AN who refuse treatment [1].

One of the important keys to assess a treatment refusal by a patient with AN is to determine whether the patient has the mental capacity to make this decision. While reviewing the ethics of coercive treatment in psychiatry, it is stated that coercive treatment can be justified only when a patient's capacity to consent is impaired and severe danger to health or life cannot be prevented by less intrusive means [2]. If the patient with AN who is refusing treatment has sufficient mental capacity, from an ethical aspect, there is a strong demand to respect the refusal of treatment as an autonomous decision. Meanwhile, if the patient's mental capacity is impaired, then asking a family member to consent on his/her behalf, for example, would allow the physician to save the patient's life and fulfill his/her duty of beneficence without compromising the patient's autonomy. Therefore, it is essential to assess the mental capacity of patients with AN when they refuse treatment.

Mental capacity is generally evaluated by four elements: understanding, appreciation, reasoning, and expression [3]. Assessment of mental capacity to consent to treatment is usually done by the treating clinician when the patient's mental capacity is unclear. However, this clinical assessment is known to overestimate mental capacity in patients [4].

Patients with AN may often not demonstrate obvious impairment in these four factors even when they refuse treatment. However, it is impossible to consider patients with AN of having mental capacity without finding impairment in terms of the above four factors. The MacArthur Competence Assessment Tool for Treatment (MacCAT-T) is one of the gold standards for assessing mental capacity [5]. A small qualitative study [6] using the MacCAT-T did not show any problems in mental capacity to consent to treatment in a sample of 10 adolescents with AN who had been severely ill. However, a quantitative study in 35 adolescents with AN [7] showed mild problems with reasoning compared to healthy controls. Elzakkars et al. examined the mental capacity of patients with AN with the clinicians' judgment and the MacCAT-T [8]. Based on clinical judgment, 29% of cases that showed full mental capacity were considered to have diminished mental capacity, while 48% of cases who showed diminished mental capacity based on clinical judgement, showed full mental capacity. Therefore, there was not a high consistency between the assessment results by the clinicians and the MacCAT-T scores.

In AN, the assessment of mental capacity by the MacCA-T has been noted to focus heavily on cognitive function, while paying little attention to the patients' values [6, 9–12]. The results of previous studies indicate that there may be points in the assessment of mental capacity of patients with AN that are difficult to be captured by the four elements of Appelbaum and Grisso. Although previous studies have identified clinician's assessment as one of the criteria for evaluating mental capacity, they have not investigated what experienced clinicians focus on when assessing mental capacity other than its general components.

Classifying the factors, other than Appelbaum and Grisso's four components, clinicians focus on while assessing the mental capacity of patients with AN who refuse required treatment may help to reduce variability among clinicians while assessing mental capacity. However, there is no research on what physicians

value in their assessment of mental capacity of patients with AN refusing treatment. Therefore, this study determined how physicians assess the mental capacity of patients with AN by conducting a survey on therapists of eating disorders in Japan, the United States (US), and the United Kingdom (UK), considering that the point of assessment of the mental capacity of patients with AN who refuse treatment is different from the general components of mental capacity.

Methods

A case of a patient with AN who refuses treatment was developed, and a questionnaire survey was conducted to assess the patient's mental capacity (Appendix 1). It evaluated whether the patient was assessed as having the ability to make decisions, the patient's wishes were respected, the patient was assessed as having no ability to make decisions, and the reasons for this decision. In addition, the respondents were asked to answer a list of 10 items in a multiple-choice format that they consider important when evaluating the mental capacity of patients with AN (Appendix 1). The 10 items were related to decision-making or cognitive ability [3, 13, 14].

We conducted an anonymous self-administered questionnaire survey delivered by mail to 212 members of the Japanese Society for Eating Disorders. For comparison, an anonymous web-based questionnaire with similar questions created and validated by back translation was conducted on eating disorders specialists in the US and UK. In the US, a web-based survey was conducted among physicians who were registered in MD. Linx (more than 415,000 physicians), are members of eating disorder-related societies, such as the Academy of Eating Disorder, and those who treated eating disorders. In the UK, a web-based survey was conducted among doctors registered in Doctors.net.uk (over 200,000 physicians) who are members of eating disorder-related societies, such as the British Eating Disorder Academy and who treated eating disorders. The web survey was conducted through a survey company that solicited responses until more than 80 responses were collected, assuming that the maximum response rate in Japan was 40%. In both the US and the UK, three announcements encouraging cooperation in the survey were made over a six-week period.

Statistical analysis

A Chi-squared test was conducted to determine the significant difference in the proportion of responses among the three countries regarding the presence of mental capacity, reasons for lack of mental capacity, and respect for self-determination. When significant differences were found among, a Chi-squared test and Bonferoni's correction were conducted. For the items that are important in assessing judgment ability, Fisher's direct method was used to examine the differences in the rate of responses. All analyses were two-tailed, and a p value < 0.05 was considered statistically significant.

Results

General characteristics of the respondents

Fifty-three responses were obtained from physicians in Japan who specialize in treating eating disorders (25% response rate). Physicians comprised of 21 psychosomatic physicians, 25 psychiatrists, and 7 adolescent medicine physicians. Psychosomatic physicians are trained in internal medicine with additional psychiatric-psychosomatic training, and both psychosomatic physicians and psychiatrists mainly treat eating disorders in Japan. Most physicians had 10 to 19 years of experience, while some had more than 30 years of experience. Most physicians treated between 50 to 99 patients per year, while some treated up to 199 (Table 1).

Table 1
Characteristics of subjects

	Years of experience as a clinician						
	< 5 years	5–9 years	10–19 years	20–29 years	> 30 years		
Japan (n = 53)	0	8	19	12	14		
UK (n = 85)	2	8	50	19	6		
US (n = 85)	4	17	32	21	5		
	Number of AN patients examined in a year						
	< 20 patients	20–49 patients	50–99 patient	100–149 patients	150–199 patients	200–299 patients	> 300 patients
Japan (n = 53)	0	8	19	11	15	0	0
UK (n = 85)	0	46	22	8	2	3	4
US (n = 85)	0	0	42	24	4	8	7
UK, United Kingdom; US, United States of America; AN, anorexia nervosa.							

Eighty-five responses were obtained from the UK. All respondents were psychiatrists. Of the physicians who responded, 28.2% worked in clinics that specialized in treating eating disorders, 24.7% worked in hospitals that specialized in treating eating disorders, while 57.0% worked in other medical facilities.

Most physicians had 10 to 19 years of experience, while some had 20 to 29 years of experience. Most physicians treated 20 to 49 patients for eating disorders per year, while some treated between 50 to 99 per year.

Eighty-five responses were obtained from the US. All respondents were psychiatrists. Of the physicians who responded, 44.7% worked in clinics that specialized in treating eating disorders, 16.5% worked in hospitals that specialized in treating eating disorders, and 38.8% worked in other medical facilities. Most physicians had 10 to 19 years of experience, while some had 20 to 29 years of experience. Most physicians treated between 50 to 99 patients per year, while some treated between 100 to 149 patients per year.

The total sample size for the three groups required for statistical analysis was 90, and this value was calculated by setting the difference at 40 points, in accordance with previous studies [3] ($\alpha = 0.05$ and $\beta = 0.1$).

Assessment of the existence of mental capacity

Approximately 70% of physicians considered the patient partially impaired but capable of making decisions. Meanwhile, 23% in Japan, 32% in the UK, and 35% in the US, physicians rated the patient as having no mental capacity, without significant differences ($p = 0.44$, $\chi^2 = 3.757$) (Table 2).

Table 2
Mental capacity assessment

	FULL MENTAL CAPACITY	DIMISHED MENTAL CAPACITY	LACK OF MENTAL CAPACITY
Japan (n = 53)	6	35	12
UK (n = 85)	12	46	27
US (n = 85)	13	42	30
p = 0.44 by $\chi^2 = 3.757$; df = 4			

Reasons for assessing a lack of mental capacity

Psychopathology was the most common reason given by physicians who judged the patients to be incompetent of making decisions. In Japan, 58%, in the US, 90.0%, and in the UK, 52% gave psychopathology as the reason, with a higher percentage in the US than in other countries, although without statistically significant differences (vs. JPN: $p = 0.07$, vs. UK: $p = 0.09$; Fisher's test) (Table 3).

Table 3
Reasons for lack of mental capacity

	Decreased level of consciousness due to malnutrition	Psychopathology of AN	Other reason
Japan (n = 12)	4	7	1
UK (n = 27)	8	14	5
US (n = 30)	1	27	2
p = 0.018 by $\chi^2 = 11.926$; df = 4			

Respect for self-determination

Respondents who answered that they had at least not lost mental capacity were asked whether they would respect a patient's self-determination to refuse treatment. In the US and the UK, 67% and 44% of physicians said that they should respect it, respectively, while only 18% of physicians in Japan agreed that they should, a significantly lower percentage compared to the US and the UK (Table 4).

Table 4
Respect for self-determination

	Respect for self-determination	No respect for self-determination
Japan (n = 41) ^{ab}	7	34
UK (n = 58) ^a	30	28
US (n = 55) ^b	37	18
p = 8.0×10^{-6} by $\chi^2 = 23.394$; df = 2		
^a p = 0.003 by Fisher's direct test		
^b p = 3×10^{-7} by Fisher's direct test		

Factors to be emphasized when assessing mental capacity

Compared to Japan, the UK and the US tended to place significantly higher importance on “short-term memory,” “ability to express a choice or preference,” “ability to understand medical information given,” “ability to appreciate medical information as it relates to oneself,” and “ability to process reasonable information.” Compared to the UK, the US was significantly more likely to emphasize “short-term memory,” “ability to understand medical information given,” and “ability to process information rationally.” Compared to Japan and the US, the UK was significantly more likely to place importance on “the ability to give appropriate weight to matters that are important to oneself (Table 5).

Table 5
Factor to be emphasized when assessing mental capacity of patients with anorexia nervosa

	short-term memory	Ability to express a choice or preference	Level of pathological values	Ability to understand medical information given	Consciousness of disease	Ability to appreciate medical information as it relates to oneself	Ability to process reasonable information	Conscious level	Consistency of preference	Ability to weigh competing factors
Japan(n = 53)	5(9%) ^{ab}	15(27%) ^{de}	30(55%)	49(89%) ^f	35(64%)	23(42%) ^{hi}	24(44%) ^{jk}	28(51%)	16 (29%)	28(51%)
UK(n = 85)	49(58%) ^{bc}	62(73%) ^e	54(64%)	75(88%) ^g	60(71%)	61(72%) ⁱ	75(88%) ^{kl}	53(62%)	34(40%)	75(88%)
US(n = 85)	36(42%) ^{ac}	54(64%) ^d	54(64%)	64(75%) ^{fg}	63(74%)	66(78%) ^h	64(75%) ^{jl}	48(56%)	35 (41%)	52(61%)
P value	6.4×10^{-8}	2.7×10^{-7}	0.493	0.033	0.419	2.9×10^{-5}	4.5×10^{-8}	0.401	0.298	3.0
	$\chi^2 = 33.1$	$\chi^2 = 30.2$	$\chi^2 = 1.4$	$\chi^2 = 6.8$	$\chi^2 = 1.8$	$\chi^2 = 20.9$	$\chi^2 = 33.8$	$\chi^2 = 1.8$	$\chi^2 = 2.4$	$\chi^2 = 3.0$
	df = 2	df = 2	df = 2	df = 2	df = 2	df = 2	df = 2	df = 2	df = 2	df = 2
^a p=2.0 × 10 ⁻⁶ by Fisher’s direct test, ^b p=2.17 × 10 ⁻⁹ by Fisher’s direct test, ^c p = 0.033 by Fisher’s direct test, ^d p=3.1 × 10 ⁻⁵ by Fisher’s direct test, ^e p=1.23 by Fisher’s direct test, ^f p=0.033 by by Fisher’s direct test, ^g p=0.02 by Fisher’s direct test, ^h p=2.8 × 10 ⁻⁵ by Fisher’s direct test, ⁱ p=0.001 by Fisher’s direct test, ^j p=1.23 × 10 ⁻⁴ by Fisher’s direct test, ^k p=2.17 × 10 ⁻⁸ by Fisher’s direct test, ^l p=0.046 by Fisher’s direct test, ^m p=2.0 × 10 ⁻⁶ by Fisher’s direct test, ⁿ p=7.8 × 10 ⁻⁵ by Fisher’s direct test										

Compared to the US and the UK, Japan showed a greater difference in trends in the factors emphasized when assessing mental capacity. Therefore, excluding Japan, we compared the factors of importance in assessing mental capacity between physicians who evaluated patients with AN in their cases as having the judgmental capacity and those who evaluated them as having lost mental capacity. Factors that physicians who rated patients with AN as competent in making decisions emphasized the order of importance; first, “ability to process reasonable information,” second, “ability to understand medical information given,” third, “ability to appreciate medical information as it relates to oneself,” fourth, “ability to express a choice or preference,” fifth, “consciousness of disease.” The items that physicians who rated patients with AN as lacking mental capacity placed the “ability to understand medical information given” and “ability to weigh competing factors” as the first and second in the order of importance, followed by “ability to process reasonable information,” “degree of morbid values,” and “consciousness of disease.” There was a significant difference in the percentage of physicians who rated “level of pathological values” and “ability to express a choice or preference” as important between those who rated the patient as having the ability to make decisions and those who rated the patient as not having the ability to make decisions (Table 6).

Table 6
Factors to be emphasized when assessing mental capacity of patients with anorexia nervosa.

	Short-term memory	Ability to express a choice or preference	Level of pathological values	Ability to understand medical information given	Consciousness of disease	Ability to appreciate medical information as it relates to oneself	Ability to process reasonable information	Conscious level	Consistency of preference	Ability to weigh competing factors
Full mental capacity (n = 113)	60/113 (53%)	83/113 (73%)	64/113 (57%)	93/113 (82%)	82/113 (73%)	88/113 (78%)	95/113 (84%)	67/113 (59%)	47/113 (42%)	81/113 (72%)
Impaired mental capacity (n = 57)	25/57 (44%)	33/57 (58%)	44/57 (77%)	46/57 (81%)	41/57 (72%)	39/57 (68%)	44/57 (77%)	34/57 (60%)	22/57 (39%)	46/57 (81%)
P value by Fisher’s direct method	0.165	0.031	0.006	0.476	0.534	0.125	0.187	0.549	0.418	0.137

Discussion

This is the first survey on how physicians, treating patients with AN in Japan, the US, and UK, assess the mental capacity of patients with AN.

Patients with AN often refuse treatment, although it may seem irrational from a general view. Mental capacity is generally evaluated by four elements, which include understanding, appreciation, reasoning, and expression [3], and most patients with AN who refuse treatment show mental capacity when evaluated from these four points of view [6, 15]. However, in this survey, ~20–30% of physicians in Japan, the UK, and US rated patients with AN who refused treatment as having impaired mental capacity. While it is possible that physicians are assessing the conventional four components of mental capacity as impaired in patients with AN who are refusing treatment, it is also possible that physicians treating patients with AN use other components.

As a result of asking physicians whether they respect the patient's treatment refusal, approximately 2/3 of physicians in Japan, 1/2 in the UK, and 1/3 in the US said that they do not respect the decision. Despite accepting that the patient has mental capacity, these physicians are considered to be placing the physician's ethical duty of beneficence to protect the patient's life above their ethical duty of respect for autonomy, which is to respect the patient's self-determination. In particular, Japan showed significantly less respect for self-determination than the UK and the US, which may be due to the fact that in Japan, in addition to the long-standing paternalism [16, 17], there is a legal system that allows for therapeutic intervention with mentally ill patients as long as the patient's guardian consents [18]. It is possible that physicians in Japan have a different attitude toward the mental capacity of patients with AN refusing treatment than in the UK and US.

Japanese physicians were significantly different than their counterparts in the US and UK in terms of items to focus on when assessing mental capacity of patients with AN. Japanese physicians focus on "short-term memory," "ability to express a choice or preference," "ability to understand medical information given," "ability to appreciate medical information as it relates to oneself," "ability to process reasonable information," and "ability to weigh competing factors" out of 10 items when assessing mental capacity. Of these, "ability to express a choice or preference," "ability to understand medical information given," "ability to appreciate medical information as it relates to oneself," and "ability to process reasonable information" are components of the mental capacity identified by Applebaum and Grisso [3], and "short-term memory" is also an essential component of the "ability to understand." The fact that these items were not emphasized when assessing mental capacity suggests that a standardized assessment of mental capacity may not be performed in Japan. One possible reason for this is that in Japan, the distinction between the capacity to make clinical decisions and the capacity to be responsible in judicial psychiatric evaluations is not clearly defined [19], and physicians may not accurately understand the concept of mental capacity as the capacity to make decisions in clinical practice. A few clinicians may confuse the assessment of cognitive function with the assessment of decision-making capacity as it is in Japan [20]. The results showed that Japan may differ from the UK and US in terms of the evaluation methods of mental capacity.

The UK tended to place significantly more emphasis on "short-term memory" and "ability to weigh competing factors" when assessing mental capacity, compared not only with Japan but also with the US. This may be since the Mental Capacity Act in the UK lists "understand the information relevant to the decision," "retain that information," and "use or weigh up that information as part of the process of making the decision" as the evaluation items for mental capacity [13], which refer to memory retention and the weighting of information.

The difference in the emphasis placed on the factors that are important when assessing mental capacity was examined between physicians in the UK and US who reported that patients with AN who refuse treatment have mental capacity and those who reported that they do not. The results showed that physicians who thought patients with AN did not have mental capacity placed significantly more importance on "level of pathological values" than those who considered they did, while those who thought patients with AN had mental capacity placed significantly more importance on "ability to express a choice or preference" than those who consider they did not. No differences were found outside of these items.

Most items listed are items of the Appelbaum and Grisso's mental capacity assessment tool commonly used in the assessment of mental capacity and items listed in the Mental Capacity Act. No differences were found in the items normally used to assess mental capacity. Some physicians regarded some patients as having the mental capacity and others did not, despite lack of difference in these items, which is consistent with the results reported by Elzakkars who found that the concordance between assessments by MacCAT-T and clinicians was not high [8].

The ethical attitude of physicians who value patient autonomy may give rise to a tendency to evaluate patients with AN as having mental capacity to make decisions whenever possible. As a result, physicians who assess mental capacity may place more weight on whether the patient with AN expresses any preference or choice to do so.

Since patients with AN tend to be evaluated as having mental capacity under the usual method of assessing mental capacity [6, 15], when a patient with AN refuses treatment, the physician is forced to choose between a paternalistic response that gives priority to treatment against the patient's wishes in accordance with the duty of beneficence, or a response that respects the patient's self-determination and gives up treatment. However, by adding "level of pathological values" to the evaluation item for the presence or absence of mental capacity, it will be possible to evaluate a patient who refuses treatment despite a life-threatening situation as having impaired his or her mental capacity. This is because the refusal to treat patients with AN is due to psychopathological values of not wanting to eat even if you were dead, brought on by the fear of becoming obese [21]. As a result, the ethical dilemma of whether to respect the patient's self-determination or prioritize the protection of the patient's life can be avoided. Tann et al. [6] point out the influence of "belief" and "change in patient's value" on assessing mental capacity of patients with AN. Moreover, psychiatrists may be assessing the mental capacity of patients with AN in a different way than they normally do [15], and the key point of their assessment method may be the "level of psychopathological values".

It may be necessary to add levels of psychopathological values to the assessment of mental capacity is necessary in relation to obesity fears and emotional disturbances in patients with AN. Elburg et al. [22] pointed out that MacCAT-T places more emphasis on the cognitive aspects of decision making, and that the problem in decision making of patients with AN is the inability to make rational decisions, which is affected by the inability to control emotions. This emotional disturbance is typically a strong fear of treatment and anxiety about recovery on the grounds of losing one's identity [23], which is thought to be linked to pathogenic psychopathology represented by the fear of gaining weight or of becoming fat [24]. However, even if emotional disturbances resulting from psychopathology do affect decision-making, the question arises of whether they can be added to the assessment of mental capacity. The ability to make decisions is the basis of mental capacity, and if the patient has the mental capacity, he or she must be respected as an autonomous being; oppositely, if the

patient has impaired mental capacity, he or she must be supported to approach an autonomous being [25]. If the patient has the mental capacity, as an autonomous being, the physician is ethically required to respect the patient's self-determination. This concept of autonomy is strongly influenced by Kantian philosophy and assumes that a rational person can deliberate and govern his or her actions [26]. For example, when a man who has become desperate due to shock and fear upon discovering that he is ill, insists on being left alone even though he has a good chance of being cured, it is not an ethical decision to regard his insistence as self-determination and accept it as is according to the principle of respect for autonomy. This is because the principle of respect for autonomy has an active duty, and the physician has an obligation to assist the patient in making decisions in a rational and personable manner. In other words, when a person is making decisions governed by emotion, we believe that he or she is not fully exercising his or her autonomy. Therefore, when psychopathology causes emotional disorders and these emotions strongly influence decision making, the patient with AN is considered to have lost his or her autonomy. Since mental capacity is related to the patient's autonomy, it is reasonable to evaluate a patient with AN who has been severely affected by psychopathology as having impaired mental capacity.

This study has some limitations. First, the Japanese survey was mailed to physicians who were members of the Japanese Society for Eating Disorders, while the UK and US surveys were web-based surveys of physicians who were members of academic societies and registered with medical networks. Although responses were obtained from physicians who treat patients with AN in all three countries, it is undeniable that the difference in survey methods may have affected the results. Second, the sample size was small, making representativeness problematic. Third, the survey was a multiple-choice questionnaire, which may have overlooked the possibility that physicians treating patients with AN may place importance on items that are not included in the options when evaluating their mental capacity. Finally, the vignette-basis for this study is that the surveyed clinicians' conclusions are not based on a robust clinical assessment but rather on an extremely limited understanding of the patient. The study results and differences seen may reflect surveyors' idiosyncratic responses to the case and not usual clinical practices and thus limits the generalizability.

In the future, it may be necessary to conduct a survey of physicians treating patients with AN, focusing on the reasons for adding the level of psychopathological values identified in this study to the assessment of mental capacity, and to evaluate what kind of psychopathological values are important to them.

Conclusion

Experienced physicians' assessments of the mental capacity of patients with AN were inconsistent. In addition to the conventional items, the "level of psychopathological values" was found to be a key factor in the evaluation of mental capacity. Since the evaluation of mental capacity is an objective of psychiatric evaluation, it is undesirable that there is variation among physicians. Patients with AN, rated by psychiatrists as having impaired mental capacity, have poorer treatment responsiveness [27], and the assessment of mental capacity is also important as a predictor of treatment prognosis. In this regard, it is desirable to reexamine the method of assessing mental capacity so that it can assess more effectively the mental capacity of patients with AN.

Abbreviations

AN anorexia nervosa

US United States

UK United Kingdom

Declarations

Ethics approval and consent to participate

This study was approved by the Ethics Committee of the Faculty of Medicine, The University of Tokyo (No. 3938-1). All subjects provided consent to participate in the study.

Consent for publication

All subjects provided consent to have their data published.

Availability of data and materials

The data that supports the findings of this study are available from the corresponding author on reasonable request.

Competing interests

The author declare no competing interests.

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Authors' contributions

YT was responsible for the study conception, design, data collection and analysis, and wrote the manuscript.

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