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Factors associated with subjective perceptions of complex issues among healthcare professionals in primary care

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1 ABSTRACT

2 Objective

3 The aim of the present study was to explore factors associated with the subjective
4 perceptions of complex issues among healthcare professionals in primary care in Japan.

5 Design

6 A cross-sectional survey was conducted via a self-administered web-based questionnaire
7 from June to October 2020 in Japan. The questionnaire included measurement of a 100-mm
8 visual analogue scale (VAS) to assess three types of subjective perception: satisfaction,
9 confidence, and burden about complex issues as the objective variable. The explanatory
10 variables included the Japanese version of the Self-assessment Scale of Interprofessional
11 Competency (JASSIC), basic demographic information, and administrative experience; as
12 well as an organizational climate scale, including the “Plan, Do, See” factor for
13 management (PDS factor), and the “Do” factor in a leader-centered direction for people
14 who work unwillingly. Factors associated with satisfaction, confidence, and burden about
15 complex issues were determined using binomial logistic regression analysis and Bonferroni
16 analysis ($p < 0.017$).

17 Participants

18 The participants were recruited from an e-mail list of the Japan Primary Care Association.

19 Results

1 We analyzed data from 593 participants with an average age of 41.2 years, comprising 133
2 nurses, 128 physicians, and 120 social workers. The median (quartile) 100-mm VAS scores
3 of satisfaction, confidence and burden about complex issues were 50 (36-70), 52 (40-70),
4 and 50 (30-66), respectively. On binomial logistic regression analysis, the higher
5 satisfaction group was significantly associated with PDS factor, Do factor, and JASSIC
6 score while the more confident group was significantly associated with age (elder), gender
7 (male), Do factor, administrative experience, and JASSIC score. No factors were associated
8 with the heavier burden group.

9 Conclusion

10 These findings reveal that the self-assessment of interprofessional competency may
11 influence perceptions of complex issues; in addition, satisfaction of complex issues might
12 be affected by easy-to-manage organizational climate and confidence might be influenced
13 by personal attributes.

14 **Keywords:** Complex, Interprofessional competency, Surveys, Questionnaire designs,
15 Organizational climate

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17 What is already known on this topic

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5 1 Previous studies have showed that psychological burden and burnout are associated with
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7 2 the care of complex problems, but few reports have identified factors associated with the
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9 3 satisfaction and confidence of professionals involved in the care of complex problems.
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17 5 What this study adds
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20 6 Interprofessional competence could affect perceptions of complex issues, and satisfaction
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22 7 with complex issues could be influenced by easy-to-manage organizational climate, while
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24 8 confidence could be influenced by personal attributes.
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28 9 How this study might affect research, practice or policy
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31 10 Interprofessional competence and organizational climates that are not strongly hierarchical
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33 11 are applicable to improve the systems of the health care institutions and increase
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35 12 satisfaction with complex problems.
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1 INTRODUCTION

2 The World Health Organization has emphasized the need to implement integrated,
3 people-centered health services, especially for those in need of care and support for
4 complex health conditions due to multiple physical and psychosocial factors (1). Elderly
5 people with multiple health problems commonly have experience of disease complications
6 and dysfunction, and their healthcare needs for psychosocial factors cross different levels of
7 care and social services (2). The medical and social professionals involved may find such
8 care complex (3). However, factors associated with the subjective perceptions of complex
9 issues among healthcare professionals have not been investigated and remain unclear.

10 Particularly in primary care, many people who require treatment and care have multiple
11 complicating factors, such as multimorbidity, and these are often not addressed by
12 guidelines for a single disease (4,5). Rather, patients with complex care needs are better
13 treated by interprofessional approaches applied to multimorbidity (5,6) Furthermore, for
14 patients with chronic and complex medical conditions, clear and compassionate
15 communication can be difficult for healthcare providers when emotionally charged
16 discussions may include treatment goals and end-of-life discussions (7). Physicians in
17 particular may not have the communication skills or confidence to engage in these complex
18 discussions (8). Of note, nurses may be better at interprofessional collaboration than other
19 professionals (9,10), while personal and environmental constraints may influence
20 subjective perceptions of such complex care responses (11).

1 Subjective perceptions of professional satisfaction and confidence with complex tasks may
2 reflect outcomes of complex tasks. Job satisfaction increases staff enthusiasm, is beneficial
3 to organizational success and progress, and leads to the delivery of high-quality services
4 (12). Professional confidence is defined as "the belief or conviction that one can
5 successfully accomplish a task or achieve a certain level of performance, as well as
6 expressing a sense of control that influences the outcome"(13). Based on these findings, we
7 speculated that outcomes for patients with complex issues might be associated with
8 professional satisfaction and confidence. More fundamentally, satisfaction and confidence
9 about coping with complex issues is an important competence for health professions. Other
10 considerations included psychological burden, as complex care can also affect healthcare
11 provider burnout and other factors (14,15). To date, however, few studies have investigated
12 factors associated with subjective perceptions of satisfaction, confidence, and burden
13 regarding complex care. Identifying which variables associated with subjective perceptions
14 of complex issues in the primary care field will assist in the development of strategies to
15 optimize interprofessional collaboration and actual care.

16 Here, we aimed to explore factors significantly associated with subjective perceptions of
17 complex issues among healthcare professionals through a survey of healthcare
18 professionals in primary care in Japan.

20 **METHODS**

1 **Design and setting**

2 A cross-sectional survey was conducted in Japan from June to October 2020 based
3 on a self-administered web-based questionnaire.

5 **Participants**

6 Included participants were primary care providers who routinely engaged in
7 interprofessional collaboration with a range of allied health professions. The participants
8 received a link to the survey via the Japan Primary Care Association (JPCA) (16) email list
9 or directly via email. This professional body was established in 2010 by the merger of three
10 academic societies in primary care and represents primary care in Japan. As of September
11 2022, 10,023 doctors, 755 pharmacists, and 688 other health professionals were registered
12 as members (17). As the number of responses from nurses, pharmacists, and rehabilitation
13 therapists was low and participants were recruited in a manner to avoid bias toward one
14 region of Japan, we adopted exponential non-discriminative snowball sampling as
15 purposive sampling through key professional informants (18), in which we directly asked
16 key professional informants to encourage their own professional peers or local participants
17 to participate.

19 **Survey instrument**

1 The survey instrument and Japanese-language instructions were administered via a web-
2 based survey platform. The survey was designed in such a way that participants who did
3 not consent or failed to respond could not submit the web-based survey. As objective
4 variables, the survey instrument included items about measurement of a visual analogue
5 scale (VAS) to assess three type of subjective perception - satisfaction, confidence, and
6 burden of complex issues. Explanatory variables were the total score of the Japanese
7 version of the Self-assessment Scale of Interprofessional Competency (JASSIC); basic
8 demographic information; experience of working as a professional, experience of working
9 in the present institution, and administrative experience; and understanding of the “Plan,
10 Do, See” factor for management (PDS factor) and the “Do” factor in a leader-centered
11 direction for people who work in an unwilling manner, using the organizational climate
12 questionnaire (19,20).

13 The VAS is designed for use in both clinical and research settings and is one of the
14 questions used to assess the subjective perceptions of study participants (21). The VAS can
15 be used to assess psychometric properties regardless of the VAS’ qualitative characteristics
16 of the property. Several employee-based studies have shown some interesting psychometric
17 properties, such as satisfactory stability and high inter-rater reliability (22). We therefore
18 used the VAS to evaluate the subjective perceptions of healthcare professionals in this
19 study.

20 The explanatory variables were selected by reviewing the literature and considering the
21 effect of complex issues and interprofessional competencies (9,23,24) These factors have

1 been associated with implicit bias in healthcare settings (25). VAS score ranged from 0 to
2 100, with 0 indicating low satisfaction, low confidence, and heavy burden. Each VAS score
3 was used as an objective variable. Participants were divided into high and low satisfaction,
4 confidence, and burden groups based on the intermediate value of 50 mm. We assumed that
5 interprofessional competencies affected subjective perceptions of such complex issues. In
6 this study, the Japanese version of the Self-assessment Scale of Interprofessional
7 Competency (JASSIC) was employed as the method for assessing interprofessional
8 competency. (Supplemental file 1) We previously validated the JASSIC through a robust
9 statistical process (26,27). This scale includes an interprofessional competency framework
10 consisting of 6 domains, and consists of a six-factor structure with 18 items, including 3
11 items per domain. In addition, we assumed that administrative experience - defined as the
12 position of head or leader of a unit, department, or institution - might also be involved in
13 complex issues. With regard to institutional factors, research into organizational climate has
14 evolved since Lewin's initial studies of experimentally created social climates (28). One
15 definition of organizational climate is "the meanings people attach to interrelated bundles
16 of experiences they have at work" (29). Thus, based on the concept of organizational
17 climate, we adopted an organizational climate questionnaire which has a two-factorial
18 structure, namely the "Plan, Do, See" factor for management (PDS factor) and the "Do"
19 factor in a leader-centered direction (30). The PDS factors imply an organizational climate
20 in which the plan-do-check-act (PDCA) cycle can be easily implemented. The higher the
21 score for PDS factors, the better the physical and psychological environment, the clearer
22 the planning of activities, the better the attention of managers, and the more autonomous

1 the organizational climate with high participation of organizational members(31). The Do
2 factor refers to a highly pressured, coercive, and unfair organizational climate in which
3 people work in an unwilling manner. The higher the Do factor score, the more manager-
4 centered the organization, the lower the participation by organizational members, and the
5 more unnecessary the workplace tension. In the present study, the questionnaire consisted
6 of a PDS factor (10 items) and a Do factor (10 items) in consideration of the organizational
7 climate that may affect interprofessional competency. Each item consisted of a 5-point
8 Likert-type scale (1=strongly disagree, 5=strongly agree), giving a possible score range for
9 each factor of 10 to 50 points.

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11 **Statistical analysis**

12 We examined the distribution of each variable. After determining the descriptive
13 statistics, we investigated the association between the exploratory variables and the
14 objective variables, namely each VAS score including satisfaction, confidence, and burden
15 of complex issues. VAS scores for satisfaction, confidence, and burden of complex issues
16 as objective variables and other continuous variables are each presented as mean (standard
17 deviation (SD) or median (range)).

18 In univariate analysis, differences between the two groups were analyzed using a t-test for
19 continuous variables and chi-squared test or Fisher's exact test for categorical variables to
20 explore factors associated with the VAS score including satisfaction, confidence, and

1 burden of complex issues. Variables found to be moderately associated with the high
2 scoring group ($P < 0.1$) were further analyzed using binomial logistic regression
3 analysis(32), which was conducted with consideration to age, type of professional,
4 administrative experience, and 20 items of the organizational climate as potential
5 cofounders. Typically, since nurses tend to adopt a more collaborative culture than other
6 professionals, we analyzed healthcare profession data by dividing subjects into nurse and
7 non-nurse (other) professions (9,24). To eliminate potential multicollinearity, significant
8 explanatory variables were reviewed based on the correlation coefficients of similar
9 variables to determine which to include in the binomial logistic regression analysis.
10 Sensitivity analysis was conducted using threshold values of 40% and 60% for the
11 respective VAS scores. All statistical analyses were performed using IBM SPSS v27.0
12 (IBM Corp., Armonk, New York). Bonferroni analysis was adopted because three objective
13 variables were analyzed in the binomial logistic regression analysis ($p < 0.17$)(33).

14 15 **Sample Size**

16 In binomial logistic regression analysis, between 15 and 20 observations for each predictor
17 variable is generally considered desirable. Accordingly, we targeted more than 240 samples
18 in this study (34).

19 20 **Ethical approval**

1 The study was approved by the Ethics Committee of the Faculty of Medicine, X University.

3 RESULTS

4 A total of 593 self-administered web-based questionnaires were analyzed. Among
5 respondents, average age (SD) was 41.2(11.3) years, 312 were women (52.6%), and
6 average professional experience and work experience at the current institution was
7 16.4(9.7) and 9.2(8.3) years, respectively. By profession, 133 were nurses (22.4%), 128
8 were doctors (21.6%), 120 were social workers (20.2%), and 113 were rehabilitation
9 therapists (19.1%). Further, 303 (51.1%) participants had administrative experience. The
10 average (SD) and median of total JASSIC score were 71.5(9.8) and 72/90 (range: 66-78).
11 Average scores (SD) of the PDS and Do factors were 31.6(6.0) and 26.7(6.4), respectively
12 (Table 1).

13 As objective variables, the average (SD) and median VAS score of satisfaction, confidence
14 and burden about complex issues were 51.3(23.3) and 50 (range: 36-70), 53.7(22.3) and 52
15 (range: 40-70), and 47.7(24.3) and 50 (range: 30-66), respectively (Table 2).

16 To identify the explanatory factors associated with subjective perceptions of complex
17 issues, we compared sociodemographic characteristics, professions, total JASSIC score,
18 PDS factor, and Do factor between the high- and low-scoring groups in univariate analysis
19 (Table 3).

1 In univariate analysis of factors associated with the higher satisfaction group for complex
2 issues, explanatory variables with a significance level of <0.1 consisted of relationships
3 with age, gender, profession (nurse or non-nurse), administrative experience, total JASSIC
4 score, PDS factor and Do factor (Table 3). Binomial logistic regression analysis was
5 performed using an analytical model that included the following explanatory variables: age,
6 gender, profession (nurse or non-nurse), administrative experience (yes/no), PDS factor,
7 and Do factor. Gender, profession, and administrative experience were coded as female=1,
8 nurse=1, and 1=yes, respectively. The odds ratio for administrative experience, PDS factor,
9 total JASSIC score and Do factor were 1.602 (95% CI 1.070 to 2.400, $p=0.022$), 1.121
10 (95% CI 1.076 to 1.167, $p<0.001$), 1.030 (95% CI 1.009 to 1.052, $p=0.005$), and 0.955
11 (95% CI 0.922 to 0.989, $p=0.010$), respectively (Table 4).

12 In univariate analysis of factors associated with the more confident group, explanatory
13 variables with a significance level of <0.1 were relationships with age, gender, experience
14 as a professional and working at the current institution, administrative experience, total
15 JASSIC score, PDS factor and Do factor (Table 3). Only years of professional experience
16 was employed as a variable since experience as a professional and working at the current
17 institution were found to be collinear. Binomial logistic analysis was performed as
18 described for the above analysis. The odds ratio for total JASSIC score, age, Do factor and
19 gender were 1.074 (95% CI 1.049 to 1.099, $p<0.001$), 1.052 (95% CI 1.028 to 1.076, p
20 <0.001), 0.947 (95 CI% 0.914 to 0.982, $p=0.003$) and 0.404 (95% CI 0.262 to 0.623,
21 <0.001), respectively (Table 4).

1 In univariate analysis of factors associated with the heavier burden group, no variables
2 showed a significant association (Table 4).

3 Employing threshold values of 40% and 60% for the respective VAS scores, the sensitivity analysis
4 produced similar findings. (Supplemental file 2)

5 **Discussion**

6 This study suggests that interprofessional competency may impact satisfaction and
7 confidence about complex issues in primary care. In addition, satisfaction of complex
8 issues might be affected by easy-to-manage organizational climate and confidence might be
9 influenced by personal attributes. In contrast, no factor was associated with heavier burden
10 of complex issues. These findings identify a number of relationships between subjective
11 perception in dealing with complex issues and interprofessional competency, organizational
12 climate, and personal attributes.

13 In our study, satisfaction and confidence with complex care were associated with self-
14 assessment of interprofessional competency. Previous studies have also indicated that
15 interprofessional collaboration is necessary for complex issues (35). In a nursing home
16 study, for example, complex patients were regarded as opportunities for interprofessional
17 learning, and participants were able to deal with these complex issues thanks to the
18 facilitation skills and ability to structure new knowledge that they had developed in
19 conflicts with professionals (36). Given that many complex issues involve uncertainty, and
20 health professionals tend to view these challenges vaguely, we consider that it would be

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5 1 useful to compare them in Figure 1 to the Model of Uncertainty in Complex Health Care
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8 2 Environments (37). (Figure 1)
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11 3 This model suggests that uncertainty issues in healthcare settings occur in a complex and
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13 4 interconnected manner among personal, scientific, and practical categories, and that one
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15 5 uncertainty issue may lead to another or occur at the same time. Therefore, it may be that
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17 6 continuing to work on complex issues fosters interprofessional competency, and that it is
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19 7 easier to view complex issues as learning opportunities. That is, these relationships between
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21 8 interprofessional competency and subjective perception of complex issues are
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23 9 interdependent.
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28 10 The association of age, administrative experience, and organizational climate with
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30 11 satisfaction about complex issues identified in this study may suggest that a bird's-eye view
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32 12 of the organization is needed to solve complex issues. Since this included knowledge of the
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34 13 healthcare environment and the organization; interpersonal and communication qualities
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36 14 and relationship management; and ability to lead people and organizations, enable and
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38 15 manage change, and communicate and manage relationships, satisfaction with complex
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40 16 issues may have increased (38). The collaborative communication strategy required for
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42 17 administrative positions includes ongoing actions that do not interfere with the free flow of
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44 18 information among members of a team or organization(39). An organizational climate that
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46 19 is adaptable to dynamic change and that does not fragment with care is useful for the
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48 20 integration of complex issues (40). Establishing an easy-to manage organizational climate
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50 21 that encourages continuous quality improvement of the system of one's medical institution
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1 is useful in resolving satisfaction about complex issues. It is therefore likely that
2 satisfaction was extracted as a variable related to the PDS factor associated with an
3 organizational climate that facilitates the PDCA cycle; in other words, as pointed out in
4 previous studies, formation of an organizational climate that allows smooth implementation
5 of the PDCA cycle and an overarching perspective able to increase satisfaction about
6 complex issues, not only among medical students but also among interprofessional teams in
7 medical institutions (41).

8 Our study may suggest that satisfaction with complex issues is more likely to be greater in
9 less authoritarian organization. Stronger hierarchical organizations often exhibit autocratic
10 and transactional forms of leadership, a situation which is often associated with worse
11 healthcare outcomes (42). On the other hand, the same study suggests that authoritarian
12 leadership may be beneficial in emergencies (42). Complex issues can sometimes benefit
13 from dictatorial leadership, but to address complex issues in a positive manner on an
14 ongoing basis, each healthcare professional must communicate in a flat, non-hierarchically-
15 directed manner and make timely and appropriate suggestions to advance complex care and
16 treatment, rather than hesitating to raise issues(43). Satisfaction about complex issues may
17 be affected by the organizational climate of the unit, department, or institution in which
18 providers work, and the formation/weak or incomplete formation of their interprofessional
19 identity(44,45), but without even personal attributes and individual experiences, including
20 age and administration.

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6 1 In contrast, we found that confidence about complex issues was influenced by age and
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8 2 gender. Confidence in clinical skills was higher for men (46) and the association between
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10 3 professional inexperience and low confidence was similar to that reported previously (47).
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12 4 However, there are reports that there is no relationship between confidence and competence
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14 5 in specific clinical skills(48). Given the nature of complex issues, it is possible that high
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16 6 confidence associated with personal attributes only may reflect overestimation(49).
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18 7 Confidence is not a substitute for competence and can be mistaken for arrogance(47).
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20 8 Given these findings, healthcare professional satisfaction may provide a more relevant and
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22 9 authentic assessment of clinical outcomes, but further validation is required.
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27 10 Finally, a heavier burden of complex issues was not associated with individual or
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29 11 organizational factors. A study of health professionals involved in COVID-19 treatment,
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31 12 the most recent global study of complexity, reported that workload and uncertainty around
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33 13 the future were the main factors related to psychological burden (50). Attributes such as
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35 14 hospital work and nursing have also been reported to affect psychological burden (51).
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37 15 Review studies suggest that psychological resources may ease the burden on mental health
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39 16 for healthcare providers (52). In this light, the interaction of individual and organizational
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41 17 variables in this study may have offset factors associated with burden and could not
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43 18 therefore be identified. Further verification is required.
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48 19 Several limitations of this study warrant mention. First, some degree of self-selection bias
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50 20 may exist, as the professionals who participated were self-selected recipients recruited
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52 21 using an e-mail list and with indiscriminate snowball sampling (27). Second, analysis by
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1 type of professional was conducted in nurses and non-nurses only. Confirmation requires a
2 larger sample more representative of the population and detailed analysis of factors (more
3 professional categories, regional differences, hospital size, etc.). As this study is
4 fundamentally an exploratory study with a limited participant pool, the extent of its
5 generalizability should be approached cautiously. In addition, future studies should also
6 evaluate objective measures associated with satisfaction about complex issues, such as
7 clinical outcomes. Third, given that this study was conducted in 2020 during the COVID-
8 19 pandemic, it could have potentially influenced subjective perceptions of the complex
9 issue. Nevertheless, allowing for these limitations, and given the current lack of evidence
10 on factors associated with health professionals' subjective perceptions of complex issues,
11 this study is valuable because it identifies factors associated with satisfaction about
12 complexity, interprofessional competencies, and administrative experience. Due to the
13 disruption caused by COVID-19 to the social system and the resulting confusion regarding
14 the complex problem, respondents' satisfaction, confidence, and perceived burden in
15 dealing with the issue might have been more grounded in reality in their responses. Our
16 findings - that an organizational climate that is not strongly hierarchical facilitates the
17 promotion of quality improvement to improve the system of the medical institution to
18 which it belongs and is associated with high satisfaction on complex issues - can be applied
19 to clinical practice, and has international significance for continuous professional
20 development in primary healthcare. Additionally, its relevance could extend to future
21 research endeavors for both health professionals and policymakers, given that the

1 satisfaction of health professionals with increasingly intricate issues could serve as a
2 reflection of the healthcare institutions' quality.

3 **Conclusion**

4 The study suggests that interprofessional competency may impact satisfaction and
5 confidence about complex issues, and that administrative experience, age, and
6 organizational climate may influence satisfaction with complex care, whereas gender and
7 age may influence confidence.

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1 Table 1. Demographic characteristics of 593 professional healthcare participants in this
 2 cross-sectional study about interprofessional education, 2020

Characteristic	
Basic demographic information	
Mean age (years)	41.2(11.3)
Female, n (%)	312 (52.6)
Mean years of experience as professional (years)	16.4(9.7)
Mean years of experience working at the current institution (years)	9.2(8.3)
Attendance type (regular)	557 (93.9)
Administrative experience (yes)	303 (51.1)
Profession (including duplicates), n (%)	
Public health nurses and nurses	133 (22.4)
Physician	128 (21.6)
Social worker	120 (20.2)
Rehabilitation therapist	113 (19.1)
Pharmacist	59 (9.9)
Care manager	25 (4.2)
Psychiatric social worker	22 (3.7)
Care worker	14 (2.4)
Others	35 (5.9)
Facility n (%)	
University hospital (over 500 beds)	55 (9.3)

Medium hospital (100-499 beds)	238 (40.1)
Small hospital (20-99 beds)	43 (7.3)
Clinic	99 (16.7)
Home-visit nursing station	23 (3.9)
Pharmacy	26 (4.4)
Administrative agency	10 (1.7)
Nursing home	28 (4.7)
Others	71 (12.0)
Total JASSIC score	
Mean (SD)	71.5 (9.8)
Median (IQR)	72 (68-78)
PDS Factor	
Mean (SD)	31.6 (6.0)
Median	32 (28-36)
Do Factor	
Mean (SD)	26.7 (6.4)
Median	26 (22-30)

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2 Abbreviations: SD, standard deviation; IQR, interquartile range; JASSIC, Japanese version
 3 of the Self-assessment Scale of Interprofessional Competency; PDS factor, “Plan, Do, See”
 4 action for management; Do factor, top-down ordering of work, such as in a leader-centered
 5 organization.

1 Table 2. VAS score of satisfaction, confidence, and burden of 593 professional healthcare
 2 participants in this cross-sectional study in 2020

VAS score of satisfaction (100mm)	
Mean (SD)	51.3 (23.3)
Median (IQR)	50 (36-70)
VAS score of confidence (100mm)	
Mean (SD)	53.7 (22.3)
Median (IQR)	52 (40-70)
VAS score of burden (100mm)	
Mean (SD)	47.7 (24.3)
Median (IQR)	50 (30-66)

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4 Abbreviations: SD, standard deviation; IQR, interquartile range; VAS, visual analogue
 5 scale.

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1 Table 3. Univariate analyses of the association of the subjective perceptions by
 2 sociodemographic characteristic

Characteristic	Satisfaction		
Sociodemographic characters	Higher satisfaction group (n=359)	Lower satisfaction group (n=234)	p-value
Mean age (years), Mean (SD)	42.5 (10.1)	41.0 (9.9)	0.074
Female, n (%)	176 (49.0)	136 (58.1)	0.030
Mean years of experience as professional (years), Mean (SD)	16.6 (9.8)	16.0 (9.6)	0.442
Mean years of experience working at the current institution (years), Mean (SD)	9.4 (8.6)	8.9 (7.8)	0.556
Attendance type (regular), n (%)	336 (93.6)	221 (94.4)	0.671
Administrative experience (yes), n (%)	210 (58.5)	94 (40.2)	<0.001
Profession (including duplicates)			
Public health nurses and nurses, n (%)	70 (19.5)	63 (26.9)	0.034
Total JASSIC score			

Mean (SD)	73.6 (8.9)	68.2 (10.3)	<0.001
PDS Factor			
Mean (SD)	33.5 (5.7)	28.8 (5.3)	<0.001
Do Factor			
Mean (SD)	25.2 (5.9)	29.1 (6.4)	<0.001
Characteristic		Confidence	
Sociodemographic characters			
	More confident group (n=388)	Less confident group (n=205)	p-value
Mean age (years), Mean (SD)	43.5 (9.8)	38.9 (9.8)	<0.001
Gender (female), n (%)	182 (46.9)	130 (63.4)	<0.001
Mean years of experience as professional (years) , Mean (SD)	17.8 (9.8)	13.7 (8.9)	<0.001
Mean years of experience working at the current institution (years), Mean (SD)	9.6 (8.7)	8.4 (7.4)	0.098
Attendance type (regular), n (%)	365 (94.1)	192 (93.7)	0.841
Administrative experience (yes), n (%)	228 (58.8)	76 (37.1)	<0.001

Profession			
Public health nurses and nurses, n (%)	83 (21.4)	50 (24.4)	0.405
Total JASSIC score			
Mean (SD)	74.0 (8.6)	66.6 (10.2)	<0.001
PDS Factor			
Mean (SD)	32.7 (6.0)	29.6 (5.6)	<0.001
Do Factor			
Mean (SD)	25.8 (6.4)	28.5 (6.1)	<0.001
Characteristic		Burden	
Sociodemographic characters			
	Heavier burden group (n=328)	Lighter burden group (n=265)	p-value
Mean age (years), Mean (SD)	42.2 (10.1)	41.6 (9.9)	0.525
Gender (female), n (%)	170 (51.8)	142 (53.6)	0.670
Mean years of experience as professional (years), Mean (SD)	16.6 (9.5)	16.2 (9.9)	0.601
Mean years of experience working at the current institution (years), Mean (SD)	9.5 (8.5)	8.8 (7.9)	0.269

Attendance type (regular), n (%)	307 (93.6)	250 (94.3)	0.707
Administrative experience (yes), n (%)	161 (49.1)	143 (54.0)	0.237
Profession (including duplicates)			
Public health nurses and nurses, n (%)	79 (24.1)	54 (20.4)	0.282
Total JASSIC score			
Mean (SD)	71.4 (9.9)	71.5 (9.8)	0.857
PDS Factor			
Mean (SD)	31.7 (6.0)	31.5 (6.1)	0.702
Do Factor			
Mean (SD)	26.6 (6.5)	26.9 (6.3)	0.640

1 Abbreviations: SD, standard deviation. JASSIC, Japanese version of the Self-assessment
 2 Scale of Interprofessional Competency; PDS factor, “Plan, Do, See” action for
 3 management; Do factor, top-down ordering of work, such as in a leader-centered
 4 organization.

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1 Table 4. Binomial logistic regression analysis of the association with higher satisfaction
 2 and more confidence by sociodemographic characteristics in this cross-sectional survey of
 3 593 Japanese professional healthcare participants in primary care

Satisfaction			
Variable	OR	95% CI	P value
Age	1.006	0.985 to 1.027	0.596
Gender (Female:1)	0.859	0.569 to 1.298	0.47
Profession (nurse:1)	0.727	0.449 to 1.179	0.196
PDS factor	1.121	1.076 to 1.167	<0.001
Do factor	0.955	0.922 to 0.989	0.01
Administrative experience	1.602	1.070 to 2.400	0.022
JASSIC	1.03	1.009 to 1.052	0.005
Confident			
Variable	OR	95% CI	P value
Age	1.052	1.028 to 1.076	<0.001
Gender (Female:1)	0.404	0.262 to 0.623	<0.001
Profession (nurse:1)	1.166	0.713 to 1.908	0.54

PDS factor	1.025	0.986 to 1.067	0.212
Do factor	0.947	0.914 to 0.982	0.003
Administrative experience	1.296	0.855 to 1.963	0.222
JASSIC	1.074	1.049 to 1.099	<0.001

1 *Binomial logistic analysis of the association with **more satisfaction, and the more**
 2 **confident group about complex issues**. Bold text indicates a statistically significant
 3 correlation with a p-value less than 0.17.

4 OR, odds ratio; CI, confidence interval; JASSIC, Japanese version of the Self-assessment
 5 Scale of Interprofessional Competency; PDS factor, “Plan, Do, See” action for
 6 management; Do factor, top-down management style, such as in a leader-centered
 7 organization

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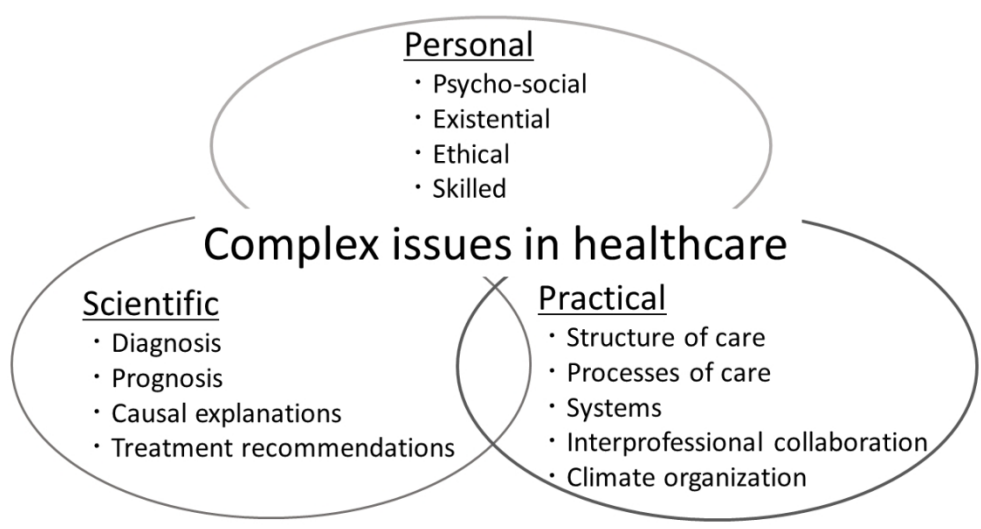
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9 **2 Figure 1. Revised model of uncertainty in a complex healthcare setting**
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日本版多職種連携コンピテンシー自己評価票：a Japanese version of Self-assessment Scale of Interprofessional Competency (JASSIC)

あなたが現在所属している組織での普段の多職種との関わりを振り返り、下記の各質問について、最も当てはまる数字を選択してください。

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 全く当てはまらない ほとんど当てはまらない どちらともいえない ある程度当てはまる とても当てはまる

*他職種は自分以外の職種を、多職種は自らの職種を含めた様々な職種のことを意味しております。

ドメイン 1：患者・利用者・家族・コミュニティ中心

1. 私は自分が把握している患者・利用者・家族の価値観や関心事を、多職種に伝えている。	1	2	3	4	5
2. 私は患者・利用者・家族を中心とした治療やケアの目標を多職種と話し合っている。	1	2	3	4	5
3. 私は患者・利用者・家族に伝えた内容について、治療やケアに関わる多職種と共有している。	1	2	3	4	5

ドメイン 2：職種間コミュニケーション

4. 私は自職種が把握している情報を、多職種に伝えている。	1	2	3	4	5
5. 私は多職種の役割や意見を尊重した返答または問いかけをしている。（非言語コミュニケーション含む）	1	2	3	4	5
6. 私は自職種の見解を、他職種にも理解できる言葉で説明している。	1	2	3	4	5

ドメイン 3：職種としての役割を全うする

7. 私は自職種がもつ一般的な知識や価値観を、他職種に伝えている。	1	2	3	4	5
8. 私は患者・利用者に対して、多職種の中で自職種の役割を果たしている。	1	2	3	4	5
9. 私は多職種から求められる自職種の役割を担っている。	1	2	3	4	5

ドメイン 4：関係性に働きかける

10. 私は多職種と対等な関係を作っている。	1	2	3	4	5
11. 私は多職種と一緒に成長している。	1	2	3	4	5
12. 私は多職種との対人葛藤を予防している。	1	2	3	4	5

ドメイン 5：自職種を省みる

13. 私は多職種が期待する自職種の役割を理解している。	1	2	3	4	5
14. 私は自施設における自職種の役割を理解している。	1	2	3	4	5
15. 私は他職種に影響しうる自職種の行動を理解している。	1	2	3	4	5

ドメイン 6：他職種を理解する

16. 私は自施設における他職種の役割を理解している。	1	2	3	4	5
17. 私は他職種が持ちやすい価値観について理解している。	1	2	3	4	5
18. 私は他職種が働く職場環境について理解している。	1	2	3	4	5

Sensitivity analysis

Satisfaction : threshold value of 50%				Satisfaction : threshold value of 40%				Satisfaction : threshold value of 60%			
Variable	OR	95% CI	P value	OR	95% CI	P value	OR	95% CI	P value		
Age	1.006	0.985 to 1.027	0.596	1.055	0.995 to 1.042	0.125	0.998	0.977 to 1.019	0.825		
Gender (Female:1)	0.859	0.569 to 1.298	0.47	0.5	0.634 to 1.555	0.975	0.67	0.441 to 1.018	0.06		
Profession (nurse:1)	0.727	0.449 to 1.179	0.196	0.709	0.402 to 1.123	0.129	0.727	0.433 to 1.222	0.229		
PDS factor	1.121	1.076 to 1.167	<0.001	1.057	1.076 to 1.173	<0.001	1.081	1.038 to 1.125	<0.001		
Do factor	0.955	0.922 to 0.989	0.01	0.962	0.913 to 0.983	<0.001	0.933	0.899 to 0.969	<0.001		
Administrative experience	1.602	1.070 to 2.400	0.022	1.469	1.05 to 2.521	0.029	1.857	1.226 to 2.813	<0.001		
JASSIC	1.03	1.009 to 1.052	0.005	1.082	0.999 to 1.044	0.056	1.052	1.028 to 1.077	<0.001		
Confidence : threshold value of 50%				Confidence : threshold value of 40%				Confidence : threshold value of 60%			
Variable	OR	95% CI	P value	OR	95% CI	P value	OR	95% CI	P value		
Age	1.052	1.028 to 1.076	<0.001	1.055	1.027 to 1.084	<0.001	1.029	1.027 to 1.084	0.008		

Gender	0.404	0.262 to	<0.001	0.500	0.304	0.822	<0.001	0.439	0.304	0.822	<0.001
(Female:1)		0.623									
Profession	1.166	0.713 to	0.54	0.709	0.410	1.227	0.219	0.936	0.41	1.227	0.787
(nurse:1)		1.908									
PDS factor	1.025	0.986 to	0.212	1.057	1.010	1.107	0.016	1.014	1.01	1.107	0.473
		1.067									
Do factor	0.947	0.914 to	0.003	0.962	0.923	1.003	0.067	0.956	0.923	1.003	0.010
		0.982									
Administrative	1.296	0.855 to	0.222	1.469	0.900	2.399	0.124	1.757	0.9	2.399	0.005
experience		1.963									
JASSIC	1.074	1.049 to	<0.001	1.082	1.054	1.111	<0.001	1.067	1.054	1.111	<0.001
		1.099									

*Binomial logistic analysis of the association with **more satisfaction, and the more confident group about complex issues**. Bold text indicates a statistically significant correlation with a p-value less than 0.17.

OR, odds ratio; CI, confidence interval; JASSIC, Japanese version of the Self-assessment Scale of Interprofessional Competency; PDS factor, “Plan, Do, See” action for management; Do factor, top-down management style, such as in a leader-centered organization

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Page No
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	Title page, P1 abstract
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	P1-3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	P4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	P5
Methods			
Study design	4	Present key elements of study design early in the paper	P6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	P6
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	P6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	P7-9
Data sources/measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	P7-9
Bias	9	Describe any efforts to address potential sources of bias	P6
Study size	10	Explain how the study size was arrived at	P10
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	P9-10
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	P9-10
		(b) Describe any methods used to examine subgroups and interactions	N/A
		(c) Explain how missing data were addressed	N/A
		(d) If applicable, describe analytical methods taking account of sampling strategy	P6
		(e) Describe any sensitivity analyses	N/A
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	P11
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	P11, Table 1-4
		(b) Indicate number of participants with missing data for each variable of interest	N/A

Outcome data	15*	Report numbers of outcome events or summary measures	P11-12, Table 4
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	P12, Table 3-4
		(b) Report category boundaries when continuous variables were categorized	P12
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	P12, Table 4
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	P13
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	P16
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	P13-17
Generalisability	21	Discuss the generalisability (external validity) of the study results	P17
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Title page

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

Exploring Factors Associated with Healthcare Professionals' Subjective Perceptions of Complex Issues in Primary Care in Japan: A Self-Administered Survey Study on Confidence, Satisfaction, and Burden Levels.

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1 **Title**

2 **Exploring Factors Associated with Healthcare Professionals' Subjective Perceptions**
3 **of Complex Issues in Primary Care in Japan: A Self-Administered Survey Study on**
4 **Confidence, Satisfaction, and Burden Levels.**

5
6 **ABSTRACT**

7 Objective

8 The aim of this study was to explore factors associated with healthcare professionals'
9 subjective perceptions of complex issues in primary care settings in Japan.

10 Design

11 Cross-sectional survey conducted through a self-administered web-based questionnaire

12 Setting

13 Japan, from June to October 2020

14 Participants

15 Healthcare professionals recruited via an email list from the Japan Primary Care

16 Association

1 Measures

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2 The questionnaire assessed subjective perception of satisfaction, confidence, and burden regarding complex issues using a 100-mm visual analogue scale (VAS). Explanatory variables included the Japanese version of the Self-assessment Scale of Interprofessional Competency (JASSIC), basic demographic information, and administrative experience, and an organizational climate scale. This scale comprised the “Plan, Do, See” (PDS) factor for management and the “Do” factor in a leader-centered direction for those working under compulsion. Factors associated with subjective perceptions were analyzed using binomial logistic regression analysis and Bonferroni analysis ($p < 0.017$).

11 Results

12 Data from 593 participants (average age of 41.2 years, including 133 nurses, 128
13 physicians, and 120 social workers) were analyzed. Median (quartile) VAS scores for
14 satisfaction, confidence and burden were 50 (36-70), 52 (40-70), and 50 (30-66),
15 respectively. Higher satisfaction group was significantly associated with PDS factor, Do
16 factor, and JASSIC score. Greater confidence group associated with older age, male, Do
17 factor, administrative experience, and JASSIC score. No factors were significantly
18 associated with the higher perceived burden.

19 Conclusion

1 These findings reveal that interprofessional competency self-assessment influence
2 perceptions of complex issues among healthcare professionals. Moreover, satisfaction with
3 complex issues might be enhanced by a manageable organizational climate, while
4 confidence might be influenced by personal attributes.

5 **Keywords:** Complex, Interprofessional competency, Surveys, Questionnaire designs,
6 Organizational climate

7 **Strengths and Limitations of this study**

- 8 • Conducts a comprehensive exploration of healthcare professionals' subjective
9 perceptions using a survey across diverse participants in Japan, ensuring broad insights into
10 primary care complexities.
- 11 • Employs validated tools like the JASSIC to provide reliable data on interprofessional
12 competency and its impact on managing complex healthcare issues.
- 13 • The study's cross-sectional design and reliance on self-reported data limit the ability to
14 infer causality and may introduce response bias, potentially affecting the interpretation of
15 perceptions of complex healthcare issues in primary care.

16

1 INTRODUCTION

2 The World Health Organization has underscored the importance of implementing
3 integrated, people-centered health services, particularly for individuals requiring care and
4 support for complex health conditions due to multiple physical and psychosocial factors
5 (1). Elderly individuals with multiple health issues commonly experience disease
6 complications and dysfunction, necessitating healthcare that spans various levels of care
7 and social services (2). The complexity of such care poses challenges for medical and
8 social professionals involved (3), yet the factors associated with healthcare professionals'
9 subjective perceptions of these complex issues have scarcely been explored and remain
10 unclear.

11 In primary care, many patients presenting for treatment have complicating factors, such as
12 multimorbidity, which are not adequately addressed by single-disease guidelines (4,5).
13 Instead, these patients benefit from interprofessional approaches tailored to multimorbidity
14 (5,6). Furthermore, clear and compassionate communication becomes challenging for
15 healthcare providers when dealing with emotionally charged discussions, including
16 treatment goals and end-of-life discussions (7). Physicians, in particular, may lack the
17 necessary communication skills or confidence to engage in these complex discussions (8).
18 Notably, nurses often excel in interprofessional collaboration compared to other
19 professionals (9,10), while subjective perceptions of complex care may be influenced by
20 personal and environmental constraints (11). Scoping reviews on physiotherapy
21 collaboration within primary care have identified several barriers, including physicians'

1 limited understanding of physiotherapy's scope, inefficient teamwork, and substantial
2 workload and scheduling challenges for physiotherapists(12). These barriers are further
3 exacerbated by ambiguities in physiotherapists' roles, patients' lack of awareness about
4 physiotherapy services, and a general deficiency in organizational knowledge about these
5 services(13,14). In contrast, the vital role of hospital social work in enhancing healthcare
6 team collaboration is recognized through its emphasis on proactive communication to build
7 relationships and facilitate information exchange, initiatives for team training and patient
8 advocacy, and effective risk management strategies(15). These strategies aim to ensure
9 seamless patient discharges and reduce liability risks. The significance of social work is
10 consistently acknowledged across various healthcare settings, including primary care
11 clinics, highlighting its indispensable contribution to improving teamwork in
12 healthcare(16).

13 Subjective perceptions of professional satisfaction and confidence in handling complex
14 tasks can reflect the outcomes of these tasks. Job satisfaction boosts staff enthusiasm,
15 contributes to organizational success, and is instrumental in delivering high-quality services
16 (17). Professional confidence is defined as "the belief or conviction that one can
17 successfully accomplish a task or achieve a certain level of performance, as well as
18 expressing a sense of control that influences the outcome"(18). Given these findings, we
19 speculated that patient outcomes for complex issues might be associated with professional
20 satisfaction and confidence. Moreover, the ability to manage complex issues confidently
21 and satisfactorily is a crucial competency for health professionals. Psychological burden,
22 potentially leading to healthcare provider burnout, is another factor impacted by complex

1 care (19–21). To date, few studies have examined the factors associated with healthcare
2 professionals' subjective perceptions of satisfaction, confidence, and burden regarding
3 complex care and interprofessional competencies. The identification of key variables within
4 primary care is crucial for devising strategies aimed at enhancing interprofessional
5 collaboration and the overall quality of care(22,23). The insights derived from this study
6 are intended to guide the development of practical interventions and policy initiatives
7 designed to promote more cohesive healthcare teams(23–25). By understanding these
8 dynamics, we can enhance satisfaction among healthcare providers, thereby contributing to
9 substantial advancements in primary care practices. Given the timing of this study amidst
10 the global COVID-19 pandemic, it's crucial to acknowledge the unique and unprecedented
11 challenges faced by healthcare professionals during this period(26,27). The pandemic has
12 not only intensified the complexity of healthcare delivery but has also potentially affected
13 healthcare professionals' perceptions of satisfaction, confidence, and burden(28–30). These
14 factors are pivotal to our investigation, and as such, the results of this study should be
15 interpreted with an understanding of the extraordinary circumstances under which the data
16 was collected. The pandemic's widespread impact on healthcare systems worldwide
17 provides a critical backdrop for our analysis, influencing both the context and the responses
18 of the healthcare professionals who participated in our study.

19 Here, we aimed to explore factors significantly associated with healthcare professionals'
20 subjective perceptions of complex issues in primary care in Japan through a comprehensive
21 survey.

1

2 **METHODS**

3 **Design and setting**

4 A cross-sectional survey was conducted in Japan from June to October 2020 based
5 on a self-administered web-based questionnaire.

6

7 **Participants**

8 Primary care providers in routine interprofessional collaboration across various health
9 professions were included. Participants were recruited through two primary methods: an e-
10 mail link from the Japan Primary Care Association (JPCA)(31) email list and directly
11 email. The JPCA, established in 2010 through the merger of three academic societies in
12 primary care academic societies, represents Japan's primary care sector with 10,023
13 doctors, 755 pharmacists, and 688 oer health professionals registered as of September
14 2022(32). Due to the exponential non-discriminative snowball sampling used to ensure
15 broad and unbiased representation across different regions of Japan, accurately calculating
16 response rates was not feasible (33). This approach was specifically chosen to mitigate
17 regional bias and address the low responses from nurses, pharmacists, and rehabilitation
18 therapists, reflecting the interprofessional nature of primary care in Japan.

19

1 Survey instrument

2 The survey, requiring consent for participation, was administered via a web-based platform.
3 It included a visual analogue scale (VAS) for assessing subjective perception of
4 satisfaction, confidence, and burden regarding complex healthcare issues. Explanatory
5 variables included the total score of the Japanese version of the Self-assessment Scale of
6 Interprofessional Competency (JASSIC), basic demographic information, professional and
7 institutional experience, administrative experience, and understanding of management
8 ("Plan, Do, See"-PDS factor-) and leader-centered direction for people who work in an
9 unwilling manner ("Do" factor), as per the organizational climate questionnaire (34,35).

10 The VAS assesses psychometric properties independent of qualitative characteristics,
11 demonstrating stability and high inter-rater reliability (36). Literature review and
12 consideration of complex issue impacts and interprofessional competencies informed the
13 selection of explanatory variables. (9,37,38) (39). Participants rated their confidence,
14 satisfaction, and burden on complex issues from 0 to 100 on the VAS, with scores divided
15 into high and low groups at the 50 mm midpoint. The questions designed to elicit broad
16 reflections was:

17 "We would like to ask you about the response to complex healthcare issues in your area or
18 facility. Where would you place your confidence/satisfaction/level of burden in responding
19 to the complex healthcare issues you are currently facing?"

1 This question aims to provide quantitative assessments of satisfaction, confidence, and
2 perceived burden, offering insights into the emotional and professional impacts of
3 managing complex healthcare issues.

4 Recognizing the potential influence of interprofessional competencies on subjective
5 perceptions of complex healthcare issues, this study utilized the Japanese version of the
6 Self-assessment Scale of Interprofessional Competency (JASSIC) to assess these
7 competencies. The JASSIC, which we have previously validated through a robust statistical
8 process (40,41), encompasses an interprofessional competency framework consisting of 6
9 domains. This framework is structured around six factors, with a total of 18 items,
10 including three items per domain.

11 Furthermore, we posited that administrative experience, defined as holding leadership role
12 within a unit, department, or institution, could play a significant role in navigating complex
13 issues. The concept of organizational climate, evolving from Lewin's initial work on
14 experimentally created social climates (42), also forms a critical component of our analysis.

15 One definition of organizational climate is "the meanings people attach to interrelated
16 bundles of experiences they have at work" (43). In alignment with this conceptual
17 framework, we adopted an organizational climate questionnaire characterized by a two-
18 factorial structure: the "Plan, Do, See"(PDS) factor for management and the "Do" factor,
19 which reflects a leader-centered direction (44). The PDS factor implies an organizational
20 climate conducive to the effective implementation of Plan-Do-Check-Act (PDCA) cycle,
21 suggesting that high scores are indicative of a more favorable physical and psychological

1 environment, the clearer activity planning, greater managerial attention, and a more
2 autonomous climate with extensive organizational member participation(45). Conversely,
3 the “Do” factor refers to a highly pressured, coercive, and unfair organizational climate
4 where employees may feel compelled to work under unfavorable conditions. Higher scores
5 on the “Do” factor score denote a more manager-centered organization with the lower staff
6 participation and increased workplace tension.

7 The questionnaire includes ten items for each of a PDS (10 items) and a Do factor (10
8 items), reflecting aspects of the organizational climate that could influence
9 interprofessional competency. Responses were collected using a 5-point Likert-type scale,
10 ranging from 1(strongly disagree) to 5 (strongly agree), allowing for a total score range of
11 10 to 50 points for each factor.

12 Details of the Japanese and English versions of this questionnaire can be referred to in
13 Supplemental file 1.

15 **Statistical analysis**

16 We examined variable distribution and descriptive statistics, exploring associations
17 between the exploratory and the objective variables (VAS scores). VAS scores for
18 satisfaction, confidence, and burden of complex healthcare issues and other continuous
19 variables are each presented as mean (standard deviation (SD) or median (range)). To
20 enhance the interpretability of our exploratory analysis, we categorized VAS scores into

1 high and low groups. This decision was informed by the study's exploratory nature and the
2 limited practical significance of minor changes in VAS scores. By simplifying the data into
3 binary variables, we aimed to uncover broad trends and relationships that offer preliminary
4 insights into the complex dynamics of satisfaction, confidence, and perceived burden
5 among healthcare professionals in primary care settings.

6 In univariate analysis, we examined differences between the two groups by using a t-test
7 for continuous variables and chi-squared test or Fisher's exact test for categorical variables,
8 to identify factors associated with the VAS scores related to satisfaction, confidence, and
9 burden. Variables with moderate association ($P < 0.1$) underwent binomial logistic
10 regression analysis(46), considering confounders such as age, type of professionals,
11 administrative experience, and 20 organizational climate items. Given the tendency of
12 nurses to engage more in a collaborative culture compared to other professionals, we
13 categorized the data by profession, distinguishing between nurse and non-nurse (other
14 professionals) (9,38). To eliminate potential multicollinearity, we reviewed significant
15 explanatory variables based on correlation coefficients, selecting those for inclusion in the
16 binomial logistic regression analysis to avoid redundancy. Sensitivity analysis used
17 threshold values of 40% and 60% for the VAS scores, ensuring a comprehensive evaluation
18 of variables' impacts. All statistical analyses were performed using IBM SPSS v27.0 (IBM
19 Corp., Armonk, New York). To account for the analysis of three objective variables within
20 the binomial logistic regression framework, we applied Bonferroni correction, setting the
21 significant level at $p < 0.017$, to maintain analytical rigor(47).

1

2 **Sample Size**

3 For the binomial logistic regression analysis, aiming for 15 and 20 observations per predictor,
4 the target a sample size exceeded 240 participants (48).

5

6 **Patient and public involvement**

7 Patients or the public were not involved in the design, or conduct, or reporting, or
8 dissemination plans.

9

10 **Ethical approval**

11 The study was approved by the Ethics Committee of the Faculty of Medicine, X University.

12

13 **RESULTS**

14 A total of 593 self-administered web-based questionnaires were analyzed. The
15 respondents had an average age of 41.2(SD=11.3), with 312 being women (52.6%). The
16 average years of professional experience and work experience at the current institution was
17 16.4(SD=9.7) and 9.2(SD=8.3), respectively. The professional breakdown included 133
18 nurses (22.4%), 128 doctors (21.6%), 120 social workers (20.2%), and 113 rehabilitation
19 therapists (19.1%). Further, 303 participants (51.1%) reported having administrative

12

1 experience. The average and median of total JASSIC score were 71.5(SD=9.8) and 72 out
2 of 90 (range: 66-78), respectively. The PDS and Do factors scored an average of 31.6
3 (SD=6.0) and 26.7(SD=6.4), respectively (Table 1).

4 Regarding the objective variables, the average (SD) and median VAS score for satisfaction,
5 confidence and burden regarding complex healthcare issues were 51.3(SD=23.3) and 50
6 (range: 36-70), 53.7(SD=22.3) and 52 (range: 40-70), and 47.7(SD=24.3) and 50 (range:
7 30-66), respectively (Table 2).

8 To identify the explanatory factors associated with healthcare professionals' subjective
9 perceptions of complex healthcare issues, we compared sociodemographic characteristics,
10 professionals, total JASSIC score, PDS factor, and Do factor between the high- and low-
11 scoring groups in univariate analyses (Supplemental Table 1).

12 Univariate analysis revealed significant associations with the higher satisfaction group at a
13 significance level of <0.1 for age, gender, profession (nurse or non-nurse), administrative
14 experience, total JASSIC score, PDS factor and Do factor (Supplemental Table 1).

15 Binomial logistic regression analysis was performed with these explanatory variables,
16 coding gender, profession, and administrative experience as female=1, nurse=1, and
17 1=yes, respectively. The odds ratios for administrative experience, PDS factor, total
18 JASSIC score and Do factor were 1.602 (95% CI 1.070 to 2.400, $p=0.022$), 1.121 (95% CI
19 1.076 to 1.167, $p<0.001$), 1.030 (95% CI 1.009 to 1.052, $p=0.005$), and 0.955 (95% CI
20 0.922 to 0.989, $p=0.010$), respectively (Table 3).

1 For the more confident group, significant associations at <0.1 included age, gender,
2 professional and institutional experience, administrative experience, total JASSIC score,
3 PDS factor and Do factor (Table 3). Due to collinearity, only years of professional
4 experience was employed in the subsequent analysis. The odds ratio for total JASSIC score,
5 age, Do factor and gender were 1.074 (95% CI 1.049 to 1.099, $p < 0.001$), 1.052 (95% CI
6 1.028 to 1.076, $p < 0.001$), 0.947 (95% CI 0.914 to 0.982, $p = 0.003$) and 0.404 (95% CI
7 0.262 to 0.623, < 0.001), respectively (Table 3).

8 The analysis of factors associated with a heavier burden did not reveal any significant
9 associations (Table 3). Consequently, we did not proceed with multivariate analysis for this
10 aspect, as the lack of significant findings in the univariate analysis suggested further
11 analysis was unlikely to yield meaningful insights into the factors influencing the
12 subjective burdens of healthcare professionals in interprofessional collaboration.

13 Sensitivity analysis, employing threshold values of 40% and 60% for VAS scores,
14 corroborated these findings. (Supplemental file 2)

16 Discussion

17 This study suggests that interprofessional competency may influence healthcare
18 professionals' satisfaction and confidence in addressing complex issues in primary care. A
19 manageable organizational climate can enhance satisfaction, while personal attributes may
20 shape confidence. Interestingly, no factor was identified as being associated with a heavier

1 burden of complex healthcare issues, highlighting distinct relationships between subjective
2 perceptions in dealing with complex healthcare issues and variables such as
3 interprofessional competency, organizational climate, and personal attributes.

4 Satisfaction and confidence in complex care were linked to the self-assessment of
5 interprofessional competency, aligning with previous findings that underscore the necessity
6 of interprofessional collaboration for complex issues (49). For instance, a study within a
7 nursing home visited complex patients as opportunities for interprofessional learning,
8 where participants managed complex issues through developed facilitation skills and the
9 ability to structure new knowledge amidst professional conflicts (50). Considering the
10 inherent uncertainty in many complex issues, where health professionals often perceive
11 challenges vaguely, we propose comparing these findings to the Model of Uncertainty in
12 Complex Health Care Environments (51). (Figure 1) This model illustrates how
13 uncertainties in healthcare are interconnected across personal, scientific, and practical
14 categories, suggesting that ongoing engagement with complex issues may enhance
15 interprofessional competency and frame such issues as learning opportunities.

16 The identified associations of age, administrative experience, and organizational climate
17 with satisfaction regarding complex healthcare issues suggest that an overarching
18 organizational perspective is crucial for addressing complex challenges. This encompasses
19 understanding the healthcare environment and the organization, interpersonal and
20 communication skills, and the ability to lead and manage change., (52). A collaborative
21 communication strategy, essential for administrative roles, includes maintaining the free

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6 1 flow of information among team or organization members(53). An adaptable organizational
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8 2 climate, resistant to fragmentation in care, supports the integration of complex issues(54),
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10 3 suggesting that satisfaction associated with an organizational climate conducive to the
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12 4 PDCA cycle. (55).

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15 5 Furthermore, our findings indicate that satisfaction with complex issues may be higher in
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17 6 less authoritarian organization, where hierarchical and autocratic leadership styles are often
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19 7 linked with poorer healthcare outcomes (56). Conversely, authoritarian leadership might be
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21 8 advantageous in emergencies (56). However, for ongoing positive management of complex
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23 9 issues, a non-hierarchical communication style and the timely, appropriate suggestions of
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25 10 ideas are vital(57). Satisfaction regarding complex issues may be affected by the
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27 11 organizational climate of the unit, department, or institution in which providers work, and
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29 12 the formation or incomplete formation of their interprofessional identity(58,59), but not
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31 13 solely by personal attributes and individual experiences, including age and administration.

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34 14 Confidence in dealing with complex issues was influenced by age and gender, with men
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36 15 and those with more experience showing higher confidence (60), and the association
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38 16 between professional inexperience and low confidence was similar to that reported
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40 17 previously (61). However, the relationship between confidence and competence,
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42 18 particularly in specific clinical skills(62), is complex and not always direct. High
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44 19 confidence, especially if based solely on personal attributes, might not accurately reflect
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46 20 competence(63). Confidence is not a substitute for competence and can be mistaken for
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48 21 arrogance(61). Given these findings, healthcare professional satisfaction may provide a

1 more relevant and authentic assessment of clinical outcomes, but further validation is
2 required.

3 A notable finding is that individual or organizational factors did not significantly associate
4 with a heavier burden of complex healthcare issues. This contrasts with studies on health
5 professionals involved in COVID-19 treatment, where workload and future uncertainty
6 were major stressors, suggesting that psychological burden (64). Attributes such as hospital
7 work and nursing have also been reported to affect psychological burden (65). Review
8 studies suggest that psychological resources may ease the burden on mental health for
9 healthcare providers (66). In this light, the interaction of individual and organizational
10 variables in this study may have offset factors associated with burden and could not
11 therefore be identified. Further verification is required.

12 Our findings highlight significant insights into healthcare professionals' perceptions of
13 complex issues within primary care settings. However, it is important to contextualize these
14 results within the ongoing COVID-19 pandemic, which has undoubtedly influenced the
15 experiences and responses of participants. The pandemic has presented a multitude of
16 challenges, from increased workloads to the rapid adaptation of new practices and
17 protocols, which could have significantly impacted the levels of satisfaction, confidence,
18 and burden reported by healthcare professionals. Therefore, while interpreting our findings,
19 one must consider the potential effects of the pandemic situation on these perceptions. The
20 pandemic's influence underscores the necessity for resilience and adaptability in healthcare

1 settings, pointing to areas where support and resources might be optimized to address the
2 evolving needs of healthcare professionals during such crisis situations.

3 Several limitations of this study warrant mention. First, potential self-selection bias may
4 exist, as the professionals who participated were self-selected recipients recruited using an
5 e-mail list and with indiscriminate snowball sampling (41). Second, our analysis by type of
6 professional was limited to nurses and non-nurses, necessitating a broader, more
7 representative sample for comprehensive analysis (more professional categories, regional
8 differences, hospital size, etc.). As this study is fundamentally an exploratory study with a
9 limited participant pool, the extent of its generalizability should be approached cautiously.
10 Future studies should also evaluate objective measures associated with satisfaction about
11 complex issues, such as clinical outcomes. Third, the timing of this study during the
12 COVID-19 pandemic might have influenced the subjective perceptions of the complex
13 healthcare issue(67,68). Due to the disruption caused by COVID-19 to the social system
14 and the resulting confusion regarding the complex problem(69,70), respondents'
15 satisfaction, confidence, and perceived burden in dealing with the issue might have been
16 more grounded in reality in their responses. Lastly, the potential overestimation of risk
17 associated with the ORs in logistic regression highlights the need for cautious interpretation
18 of our findings, particularly in decision-making contexts(71). Nevertheless, allowing for
19 these limitations, and given the current lack of evidence on factors associated with health
20 professionals' subjective perceptions of complex issues, this study is valuable because it
21 identifies factors associated with satisfaction about complexity, interprofessional
22 competencies, and administrative experience. Our findings - that an organizational climate

1 that is not strongly hierarchical facilitates the promotion of quality improvement to improve
2 the system of the medical institution to which it belongs and is associated with high
3 satisfaction on complex issues - can be applied to clinical practice, and has international
4 significance for continuous professional development and interprofessional education in
5 primary healthcare. Additionally, its relevance could extend to future research endeavors
6 for both health professionals and policymakers, given that the satisfaction of health
7 professionals with increasingly intricate issues could serve as a reflection of the healthcare
8 institutions' quality.

9 **Conclusion**

10 The study suggests that interprofessional competency, administrative experience, age,
11 and organizational climate significantly influence satisfaction with complex healthcare
12 issues, while confidence is shaped by gender and age. These findings underscore the
13 importance of fostering a supportive, non-hierarchical organizational climate and
14 continuous development in primary healthcare, offering insights for both clinical practice
15 and future research.

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6 **1 Contributor ships statement**

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9 2 JH and GH conceived and designed the study, conducted all qualitative inquiries, and
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11 3 analyzed the data. JH primarily wrote and revised the manuscript, while GH reviewed and
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13 4 approved the final version.

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17 **5 Competing interests**

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32 **10 Data sharing statement**

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35 11 The data collected and analyzed during the current study are not publicly available because
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37 12 we did not receive informed consent concerning data sharing from the participants.

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41 **13 Ethical statement**

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44 14 The study was approved by the Ethics Committee of the Faculty of Medicine, University of
45
46 15 Tsukuba (Approval No.: 1483).

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1 Table 1. Demographic characteristics of 593 professional healthcare participants in this
 2 cross-sectional study about interprofessional education, 2020

Characteristic	
Basic demographic information	
Mean age (years)	41.2(11.3)
Female, n (%)	312 (52.6)
Mean years of experience as professional (years)	16.4(9.7)
Mean years of experience working at the current institution (years)	9.2(8.3)
Attendance type (regular)	557 (93.9)
Administrative experience (yes)	303 (51.1)
Profession (including duplicates), n (%)	
Nurses	133 (22.4)
Physician	128 (21.6)
Social worker	120 (20.2)
Rehabilitation therapist	113 (19.1)
Pharmacist	59 (9.9)
Care manager	25 (4.2)
Psychiatric social worker	22 (3.7)
Care worker	14 (2.4)
Others	35 (5.9)
Facility n (%)	
University hospital (over 500 beds)	55 (9.3)

Medium hospital (100-499 beds)	238 (40.1)
Small hospital (20-99 beds)	43 (7.3)
Clinic	99 (16.7)
Home-visit nursing station	23 (3.9)
Pharmacy	26 (4.4)
Administrative agency	10 (1.7)
Nursing home	28 (4.7)
Others	71 (12.0)
Total JASSIC score	
Mean (SD)	71.5 (9.8)
Median (IQR)	72 (68-78)
PDS Factor	
Mean (SD)	31.6 (6.0)
Median	32 (28-36)
Do Factor	
Mean (SD)	26.7 (6.4)
Median	26 (22-30)

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2 Abbreviations: SD, standard deviation; IQR, interquartile range; JASSIC, Japanese version
 3 of the Self-assessment Scale of Interprofessional Competency; PDS factor, “Plan, Do, See”
 4 action for management; Do factor, top-down ordering of work, such as in a leader-centered
 5 organization.

1 Table 2. VAS score of satisfaction, confidence, and burden of 593 professional healthcare
 2 participants in this cross-sectional study in 2020

VAS score of satisfaction (100mm)	
Mean (SD)	51.3 (23.3)
Median (IQR)	50 (36-70)
VAS score of confidence (100mm)	
Mean (SD)	53.7 (22.3)
Median (IQR)	52 (40-70)
VAS score of burden (100mm)	
Mean (SD)	47.7 (24.3)
Median (IQR)	50 (30-66)

3
 4 Abbreviations: SD, standard deviation; IQR, interquartile range; VAS, visual analogue
 5 scale

1 Table 3. Binomial logistic regression analysis of the association with higher satisfaction
 2 and more confidence by sociodemographic characteristics in this cross-sectional survey of
 3 593 Japanese professional healthcare participants in primary care

Satisfaction			
Variable	OR	95% CI	P value
Age	1.006	0.985 to 1.027	0.596
Gender (Female:1)	0.859	0.569 to 1.298	0.47
Profession (nurse:1)	0.727	0.449 to 1.179	0.196
PDS factor	1.121	1.076 to 1.167	<0.001
Do factor	0.955	0.922 to 0.989	0.01
Administrative experience	1.602	1.070 to 2.400	0.022
JASSIC	1.03	1.009 to 1.052	0.005
Confident			
Variable	OR	95% CI	P value
Age	1.052	1.028 to 1.076	<0.001
Gender (Female:1)	0.404	0.262 to 0.623	<0.001
Profession (nurse:1)	1.166	0.713 to 1.908	0.54

PDS factor	1.025	0.986 to 1.067	0.212
Do factor	0.947	0.914 to 0.982	0.003
Administrative experience	1.296	0.855 to 1.963	0.222
JASSIC	1.074	1.049 to 1.099	<0.001

1 *Binomial logistic analysis of the association with **more satisfaction, and the more**
 2 **confident group about complex issues**. Bold text indicates a statistically significant
 3 correlation with a p-value less than 0.17.

4 OR, odds ratio; CI, confidence interval; JASSIC, Japanese version of the Self-assessment
 5 Scale of Interprofessional Competency; PDS factor, “Plan, Do, See” action for
 6 management; Do factor, top-down management style, such as in a leader-centered
 7 organization

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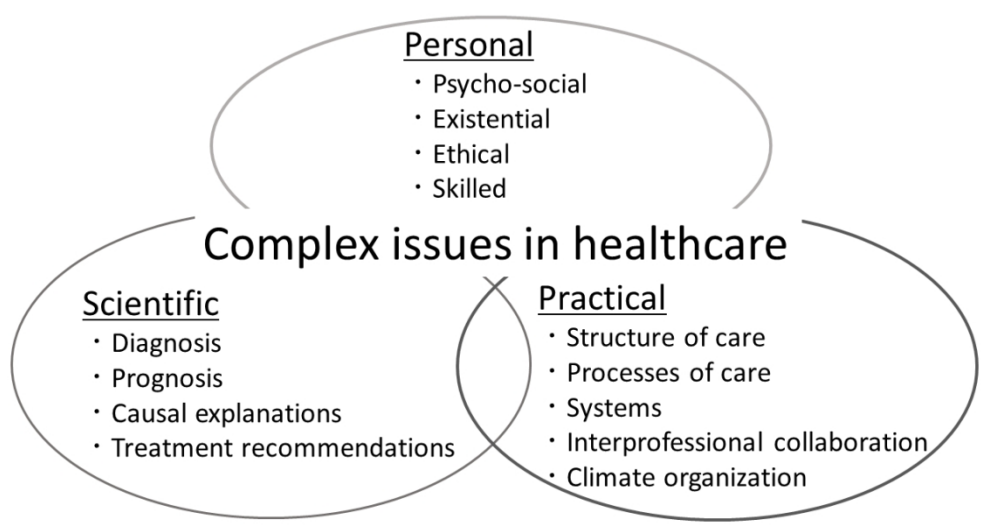
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5 **1 Figure legend**
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9 **2** Figure 1. Revised model of uncertainty in a complex healthcare setting
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Supplemental Table 1. Univariate analyses of the association of the subjective perceptions by sociodemographic characteristic

Characteristic	Satisfaction			Confidence			Burden		
	Higher satisfaction (n=359)	Lower satisfaction (n=234)	p-value	More confident (n=388)	Less confident (n=205)	p-value	Heavier burden (n=328)	Lighter burden (n=265)	p-value
Mean age (years), Mean (SD)	42.5 (10.1)	41.0 (9.9)	0.074	43.5 (9.8)	38.9 (9.8)	<0.001	42.2 (10.1)	41.6 (9.9)	0.525
Female, n (%)	176 (49.0)	136 (58.1)	0.030	182 (46.9)	130 (63.4)	<0.001	170 (51.8)	142 (53.6)	0.670
Mean years of experience (years), Mean (SD)	16.6 (9.8)	16.0 (9.6)	0.442	17.8 (9.8)	13.7 (8.9)	<0.001	16.6 (9.5)	16.2 (9.9)	0.601
Mean years of experience working at the current institution (years), Mean (SD)	9.4 (8.6)	8.9 (7.8)	0.556	9.6 (8.7)	8.4 (7.4)	0.098	9.5 (8.5)	8.8 (7.9)	0.269
Attendance type (regular), n (%)	336 (93.6)	221 (94.4)	0.671	365 (94.1)	192 (93.7)	0.841	307 (93.6)	250 (94.3)	0.707

Administrative experience (yes), n (%)	210 (58.5)	94 (40.2)	<0.001	228 (58.8)	76 (37.1)	<0.001	161 (49.1)	143 (54.0)	0.237
Profession (including duplicates)									
Public health nurses and nurses, n (%)	70 (19.5)	63 (26.9)	0.034	83 (21.4)	50 (24.4)	0.405	49 (24.1)	54 (20.4)	0.282
Total JASSIC score									
Mean (SD)	73.6 (8.9)	68.2 (10.3)	<0.001	74.0 (8.6)	66.6 (10.2)	<0.001	71.4 (9.9)	71.5 (9.8)	0.857
PDS Factor									
Mean (SD)	33.5 (5.7)	28.8 (5.3)	<0.001	32.7 (6.0)	29.6 (5.6)	<0.001	31.7 (6.0)	31.5 (6.1)	0.702
Do Factor									
Mean (SD)	25.2 (5.9)	29.1 (6.4)	<0.001	25.8 (6.4)	28.5 (6.1)	<0.001	26.6 (6.5)	26.9 (6.3)	0.640

Abbreviations: SD, standard deviation. JASSIC, Japanese version of the Self-assessment Scale of Interprofessional Competency; PDS factor, “Plan, Do, See” action for management; Do factor, top-down ordering of work, such as in a leader-centered organization.

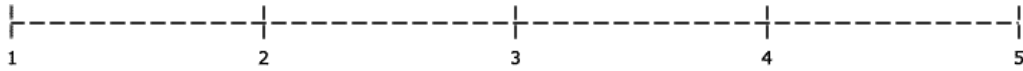
Domain 6: Understanding other professions

16. I understand the role and functions of other professionals at the facility where I serve as a staff member.

17. I understand the concept of values that other professionals tend to have.

18. I understand the work environment in which other professionals operate.

2) For the following 1-20 items, be sure to choose one from 1, 2, 3, 4, or 5 and select the appropriate number.



Strongly disagree

Neither

Strong agree

1. Staff members appear to be willing to do whatever it takes to fulfill their roles.

2. There is a strict requirement to follow the organization's policies and regulations.

3. The staff does a very good job.

4. Managers (department heads and section managers) may scold, but rarely praise.

5. What must be done that day is explained to the staff in detail.

6. If the work is not done immediately, something is likely to be said about it.

7. The agenda for the meeting is well organized and general.

8. There is a tendency in organizations to ignore the existence of individuals.

9. The attention and guidance of middle management extends to the details.

10. The manager is rather constantly checking on the staff.

11. The results of the meeting are always applied to the next job.

12. Many staff members consider organizational traditions and customs to be quite compulsory.

13. Each employee has important responsibilities.

14. Be able to express his/her opinion without the supervision of the manager.

15. Managers always try to treat their subordinates fairly.

16. Employees are granted the freedom to do as they please.

17. The organization is very interesting.

18. The manager tries to integrate himself/herself into the staff.

19. Few people in the organization are willing to work on their own initiative.

20. Staff members always feel pressured to do their jobs.

3) We would like to ask you about the response to complex healthcare issues in your area or facility. Where would you place your confidence/satisfaction/level of burden in responding to the complex healthcare issues you are currently facing?

Confidence level:

Not at all confident _____ Very confident

Satisfaction:

Not satisfied at all _____ Very satisfied

Burden Level:

Very burdensome _____ Not burdensome at all

Tell us about yourself.

4) What is your age? () years

5) What is your gender? Male Female

6) What is your facility affiliation?

University hospitals, Hospitals with over 500 beds, Hospitals with 100-499 beds, Hospitals with 20-99 beds, Clinics with beds, Clinics without beds, Visiting nurse stations, Community comprehensive support centers, Health centers, Long-term care medical facilities (hospitals), Long-term care medical facilities (clinics), Long-term care health facilities for the elderly, Welfare facilities for the elderly, Helper stations, Government (not including community comprehensive support centers and health centers) Elementary/Junior high schools/High schools, Universities, Others (free answers)

7) What is the location (prefecture) of your institution?

8) What is your job title?

Physician, Public health nurse/nurse, Pharmacist, Dentist, Dental hygienist, Physical therapist, Occupational therapist, Speech therapist, Radiologic technologist, Clinical technologist, Long-term care support specialist, Social worker, Psychologist, Dietitian, Psychiatric social worker, Care worker, Other (free text)

9) How many years of professional experience do you have? Please include periods of maternity leave and other leaves of absence. () years

10) How long have you been employed at the hospital/clinic/facility to which you currently belong? Please include periods of leave such as maternity leave. () years

11) What type of work do you do at your current place of employment? Full-time, Part-time

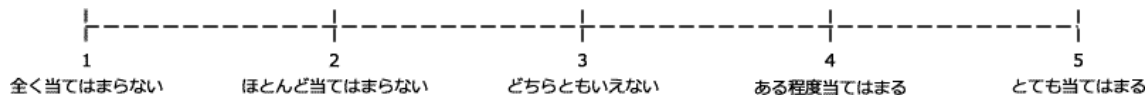
12) Please indicate whether or not you have experience in administrative duties (coordinating staff work, managing personnel, etc.) in your current workplace. Yes No

13) Please indicate whether or not you have received interprofessional education at a university or training school. Yes No

14) Please tell us whether you have had any experience with interprofessional education in your organization or community (e.g., case study meetings, community comprehensive care meetings, etc.). Yes No

Web 調査票（日本語）

1)あなたが現在所属している組織での普段の多職種との関わりを振り返り、下記の各質問について、最も当てはまる数字を選択して下さい。



*他職種は自分以外の職種を、多職種は自らの職種を含めた様々な職種のことを意味しております。

ドメイン 1：患者・利用者・家族・コミュニティ中心

- | |
|---|
| 1. 私は、自分が把握している患者・利用者・家族の価値観や関心事を、多職種に伝えている。 |
| 2. 私は患者・利用者・家族を中心とした治療やケアの目標を多職種と話し合っている。 |
| 3. 私は患者・利用者・家族に伝えた内容について、治療やケアに関わる多職種と共有している。 |

ドメイン 2：職種間コミュニケーション

- | |
|--|
| 4. 私は自職種が把握している情報を、多職種に伝えている。 |
| 5. 私は多職種の役割や意見を尊重した返答または問いかけをしている。（非言語コミュニケーション含む） |
| 6. 私は自職種の見解を、他職種にも理解できる言葉で説明している。 |

ドメイン 3：職種としての役割を全うする

- | |
|--------------------------------------|
| 7. 私は自職種がもつ一般的な知識や価値観を、他職種に伝えている。 |
| 8. 私は患者・利用者に対して、多職種の中で自職種の役割を果たしている。 |
| 9. 私は多職種から求められる自職種の役割を担っている。 |

ドメイン 4：関係性に働きかける

- | |
|-------------------------|
| 10. 私は多職種と対等な関係を作っている。 |
| 11. 私は多職種と一緒に成長している。 |
| 12. 私は多職種との対人葛藤を予防している。 |

ドメイン 5：自職種を省みる

- | |
|-------------------------------|
| 13. 私は多職種が期待する自職種の役割を理解している。 |
| 14. 私は自施設における自職種の役割を理解している。 |
| 15. 私は他職種に影響しうる自職種の行動を理解している。 |

ドメイン 6：他職種を理解する

- | |
|-------------------------------|
| 16. 私は自施設における他職種の役割を理解している。 |
| 17. 私は他職種が持ちやすい価値観について理解している。 |
| 18. 私は他職種が働く職場環境について理解している。 |

3) あなたが所属している地域あるいは施設での複雑な問題への対応についてお聞きします。あなたが今感じている複雑な問題への対応についての自信度・満足度・負担度はどの位置にありますか？

自信度：

全く自信がない _____ とても自信がある

満足度：

全く満足していない _____ とても満足している

負担度：

とても負担が大きい _____ 全く負担はない

あなたのことについて教えてください。

4) 年齢を教えてください。() 歳

5) 性別を教えてください。 男性 女性

6) 所属している施設を教えてください。

大学病院、500床以上の病院、100-499床の病院、20-99床の病院、有床診療所、無床診療所、訪問看護ステーション、地域包括支援センター、保健センター、介護療養型医療施設（病院）、介護療養型医療施設（診療所）、介護老人保健施設、介護老人福祉施設、ヘルパーステーション、行政（地域包括支援センターや保健センターを含まない）、小・中・高等学校、大学、その他（自由記載）

7) 所属している施設の所在地（都道府県）を教えてください。

8) 職種 を教えてください。

医師 保健師・看護師 薬剤師 歯科医 歯科衛生士 理学療法士
作業療法士 言語聴覚士 放射線技師 臨床検査技師 介護支援専門員
社会福祉士 心理職 管理栄養士 精神保健福祉士 介護福祉士
その他（自由記載）

9) 専門職としての経験年数を教えてください。※産休などの休職期間なども含めて、記載して下さい。() 年

10) 現在所属している病院・診療所・施設等への勤続年数を教えてください。※産休などの休職期間なども含めて、記載して下さい。() 年

11) 今の職場での勤務形態を教えてください。

常勤 非常勤

12) 今の職場での管理業務（職員の業務の調整、人事管理など）の経験の有無を教えてください。

あり なし

13) 大学や養成校で多職種連携教育を受けた経験の有無を教えてください。

あり なし

14) 組織や地域で多職種連携教育を受けた経験の有無（事例検討会や地域包括ケア会議など）を教えてください。

あり なし

Sensitivity analysis

Satisfaction : threshold value of 50%				Satisfaction : threshold value of 40%				Satisfaction : threshold value of 60%			
Variable	OR	95% CI	P value	OR	95% CI	P value	OR	95% CI	P value		
Age	1.006	0.985 to 1.027	0.596	1.055	0.995 1.042	0.125	0.998	0.977 1.019	0.825		
Gender (Female:1)	0.859	0.569 to 1.298	0.47	0.5	0.634 1.555	0.975	0.67	0.441 1.018	0.06		
Profession (nurse:1)	0.727	0.449 to 1.179	0.196	0.709	0.402 1.123	0.129	0.727	0.433 1.222	0.229		
PDS factor	1.121	1.076 to 1.167	<0.001	1.057	1.076 1.173	<0.001	1.081	1.038 1.125	<0.001		
Do factor	0.955	0.922 to 0.989	0.01	0.962	0.913 0.983	<0.001	0.933	0.899 0.969	<0.001		
Administrative experience	1.602	1.070 to 2.400	0.022	1.469	1.05 2.521	0.029	1.857	1.226 2.813	<0.001		
JASSIC	1.03	1.009 to 1.052	0.005	1.082	0.999 1.044	0.056	1.052	1.028 1.077	<0.001		
Confidence : threshold value of 50%				Confidence : threshold value of 40%				Confidence : threshold value of 60%			
Variable	OR	95% CI	P value	OR	95% CI	P value	OR	95% CI	P value		
Age	1.052	1.028 to 1.076	<0.001	1.055	1.027 1.084	<0.001	1.029	1.027 1.084	0.008		

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Gender	0.404	0.262 to	<0.001	0.500	0.304	0.822	<0.001	0.439	0.304	0.822	<0.001
(Female:1)		0.623									
Profession (nurse:1)	1.166	0.713 to	0.54	0.709	0.410	1.227	0.219	0.936	0.41	1.227	0.787
PDS factor	1.025	0.986 to	0.212	1.057	1.010	1.107	0.016	1.014	1.01	1.107	0.473
		1.067									
Do factor	0.947	0.914 to	0.003	0.962	0.923	1.003	0.067	0.956	0.923	1.003	0.010
		0.982									
Administrative experience	1.296	0.855 to	0.222	1.469	0.900	2.399	0.124	1.757	0.9	2.399	0.005
JASSIC	1.074	1.049 to	<0.001	1.082	1.054	1.111	<0.001	1.067	1.054	1.111	<0.001
		1.099									

*Binomial logistic analysis of the association with **more satisfaction, and the more confident group about complex issues**. Bold text indicates a statistically significant correlation with a p-value less than 0.17.

OR, odds ratio; CI, confidence interval; JASSIC, Japanese version of the Self-assessment Scale of Interprofessional Competency; PDS factor, “Plan, Do, See” action for management; Do factor, top-down management style, such as in a leader-centered organization

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Page No
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	Title page, P1 abstract
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	P1-3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	P4-5
Objectives	3	State specific objectives, including any prespecified hypotheses	P5
Methods			
Study design	4	Present key elements of study design early in the paper	P6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	P6
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	P6
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	P7-9
Data sources/measurement	8	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	P7-9
Bias	9	Describe any efforts to address potential sources of bias	P6
Study size	10	Explain how the study size was arrived at	P10
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	P9-10
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	P9-10
		(b) Describe any methods used to examine subgroups and interactions	N/A
		(c) Explain how missing data were addressed	N/A
		(d) If applicable, describe analytical methods taking account of sampling strategy	P6
		(e) Describe any sensitivity analyses	N/A
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	P11
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	P11, Table 1-4
		(b) Indicate number of participants with missing data for each variable of interest	N/A

Outcome data	15*	Report numbers of outcome events or summary measures	P11-12, Table 4
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	P12, Table 3-4
		(b) Report category boundaries when continuous variables were categorized	P12
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	P12, Table 4
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	P13
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	P16
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	P13-17
Generalisability	21	Discuss the generalisability (external validity) of the study results	P17
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Title page

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.