

**Confidence in communicating with patients with cancer mediates the relationship between rehabilitation therapists' autistic-like traits and perceived difficulty in communication**

Chinatsu Hayashibara<sup>1</sup>, Masatoshi Inagaki<sup>2</sup>, Maiko Fujimori<sup>3, 4</sup>, Yuji Higuchi<sup>5</sup>, Masaki Fujiwara<sup>1</sup>, Seishi Terada<sup>1</sup>, Hitoshi Okamura<sup>6</sup>, Yosuke Uchitomi<sup>7</sup>, Norihito Yamada<sup>1</sup>

<sup>1</sup> Department of Neuropsychiatry, Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Science, Okayama, Japan

<sup>2</sup> Department of Neuropsychiatry, Okayama University Hospital

<sup>3</sup> Section Chief of Office for Promotion of Support for Suicide Survivors, Japan Support Center for Suicide Countermeasures, National Institute of Mental Health, National Center for Neurology and Psychiatry

<sup>4</sup> Division of Health Care Research, QOL Research Group, Center for Public Health Sciences, National Cancer Center Japan

<sup>5</sup> TAIYO HILLS Hospital

<sup>6</sup> Department of Psychosocial Rehabilitation, Institute of Biomedical & Health Sciences, Hiroshima University

<sup>7</sup> Innovation Center for Supportive, Palliative and Psychosocial Care, and Department of Psycho-Oncology, National Cancer Center Hospital, and Center for Public Health Sciences, National Cancer Center

Corresponding author: Masatoshi Inagaki, Department of Neuropsychiatry, Okayama University Hospital, 2-5-1 Shikata-cho, Kita-ku, Okayama 700-8558, Japan

Phone: +81-86-235-7242; Fax: +81-86-235-7246

E-mail: masatoshiinagaki@okayama-u.ac.jp

Short title:

Confidence ameliorate communication difficulty

Number of manuscript pages 21

Number of tables 2

Number of figures 4

**Confidence in communicating with patients with cancer mediates the relationship between rehabilitation therapists' autistic-like traits and perceived difficulty in communication**

**ABSTRACT**

*Objective:* Recently, rehabilitation therapists have become involved in cancer rehabilitation; however, no communication skills training that increases the ability to provide emotional support for cancer patients has been developed for rehabilitation therapists. In addition, no study has examined associations between rehabilitation therapists' communication skills and their level of autistic-like traits (ALT), which are in-born characteristics including specific communication styles and difficulty communicating with patients. In this study, we aimed to investigate whether confidence in communicating with patients mitigates communication difficulties experienced by rehabilitation therapists who have high levels of ALT.

*Methods:* Rehabilitation therapists who treat patients with cancer completed self-administered postal questionnaires anonymously. Scores were obtained on the Autism-Spectrum Quotient short form, confidence in communication, and communication difficulties. We used covariance structure analyses to test hypothetical models, and confirmed that confidence in communication mediates the relationship between ALT and perceived communication difficulties.

*Results:* Participants included 1343 respondents (49.6%). Autism-Spectrum Quotient scores were positively correlated with communication difficulties ( $r=0.16$ ,  $p<0.001$ ). The correlation was mitigated by confidence in communication in the fit model.

However, higher confidence in creating a supportive atmosphere was associated with more difficulty in communication ( $r=0.16$ ,  $p<0.001$ ).

*Significance of Results:* Communication difficulty was linked to rehabilitation therapists' ALTs. By increasing confidence in areas of communication other than creation of a supportive atmosphere, ALT-related difficulties in communication may be ameliorated. Confidence to create supportive environments correlated positively with difficulty. Communication skills training to increase confidence in communication for rehabilitation therapists should be developed with vigilance regarding ALT levels.

**KEYWORDS:** Communication, Communication difficulty, Autistic-like traits, Confidence, Rehabilitation therapist

## **INTRODUCTION**

Patients suffering from cancer have distressing experiences, from the initial perception of the physical symptoms of cancer all the way through the terminal stage (Akizuki et al., 2016; Pranjic et al., 2016). Kerr et al. (Kerr et al., 2003) reported that in a questionnaire survey of breast cancer patients, 59% of the patients agreed with the statement, "I want to talk more with the medical staff in charge." Lower quality of life was also found in patients who were not satisfied with the communication with their medical professionals. Patients with cancer are eager not only for satisfactory communication with, but also emotional support from, medical staff (Willems et al., 2017). Rehabilitation is one occasion in which emotional support can be offered to cancer patients in distress (Karitsky et al., 2015). Based on the findings of a study showing that rehabilitation may have a role to play in maintaining and improving the quality of life of cancer patients, emotional supports are recommended in rehabilitation for patients in all stages of cancer, in addition to physical rehabilitation and practice with activities of daily living (Okamura, 2011). Therefore, rehabilitation therapists (including physical, occupational, or speech therapists) require skills in communication with cancer patients to support them emotionally.

Several studies have shown effects of communication skills training (CST) of doctors and nurses to increase emotional support for cancer patients (Moore et al., 2013). Fujimori et al. (Fujimori et al., 2014a) reported that communication skills based on patients' preferences comprised four elements, grouped into the acronym "SHARE": setting up a supportive environment for the interview [S (ENV)], considering how to deliver bad news [H (HOW)], discussing additional information [A (ADD)], and providing reassurance and responding empathically to the patient's emotions [RE

(EMP)]. In two studies (Fujimori et al., 2014b; Tang et al., 2014), CST developed based on patients' preferences for medical communication increased confidence of oncologists to communicate with cancer patients. Also, Razavi et al. (Razavi et al., 2002) reported that this type of CST increased the use of emotional words by not only doctors but also nurses in communicating with patients with cancer. However, no CST that targets cancer patients' satisfaction with rehabilitation therapists' communication has been developed.

Autistic-like traits (ALT) are characteristics related to experienced difficulties in communicating. These traits are life-long and appear immediately after birth (American Psychiatric Association, 2013). A severe form of ALT is usually characterised as autism spectrum disorder (ASD). Symptoms of ASD include communication disorder, social interaction difficulty and deficiency of flexibility in interests and behaviours (World Health Organization, 1992). ALT differs from ASD in severity; however, ALT can be regarded as a milder form of ASD that is within the spectrum of "normality" (Lundstrom et al., 2012). A recent study reported the prevalence of ASD in Japan was 1.8% (Kawamura et al., 2008). If this estimation of prevalence was extended to include ALT (which is a milder form of ASD), more people would be affected. Similarly, there may be medical staff with high ALT, and it is likely that medical staff with high ALT may have difficulty communicating with patients. Higuchi et al. reported a high prevalence of severe ALT among medical staff (measured with a questionnaire), although participants in that study were not rehabilitation therapists (Higuchi et al., 2016). Those authors previously showed that medical staff with high ALT had lower levels of empathic attitudes toward patients (Higuchi et al., 2015). Therefore, special consideration is needed to increase the communication skills

of medical staff with high ALT. To develop effective CST for rehabilitation therapists, it is necessary to clarify the relationship between an individual's ALT and difficulty communicating with patients.

Higher ALT may also be related to deterioration of mental health among rehabilitation therapists, because of more difficult and burdensome communication with patients with cancer; in turn, this may make medical staff hesitant to communicate with patients. Patients with ASD experience difficulty in communication and tend to avoid communication (American Psychiatric Association, 2013). Reducing difficulties in communication may promote better communication between rehabilitation therapists and patients with cancer, especially rehabilitation therapists with high ALT. As previously mentioned, doctors' confidence in communicating with patients with cancer can be increased by CST (Fujimori et al., 2014b). It is reasonable to expect that this increased confidence, in turn, results in behavioural changes in communicating with patients with cancer (Bandura, 1977). In this study, we investigated whether confidence in communicating with patients with cancer mediated the relationship between rehabilitation therapists' ALT and perceived difficulty in communication. The findings will assist the development of the specialized CST interventions for rehabilitation therapists with high ALT who experience difficulty in communicating with patients.

## **METHODS**

### **Participants**

Inclusion criteria were: status as a certified rehabilitation therapist; participation in an educational program for cancer rehabilitation conducted by legally and institutionally authorized person commissioned by the Ministry of Health, Labour and Welfare of

Japan (July 10, 2010 – May 18, 2014); and affiliated with registered hospitals on January 2015. Exclusion criteria were not working at registered hospital in January 2015, or being on maternity leave. We mailed self-administered questionnaires to eligible candidates and informed them in writing of the aims, methods, risks, and benefits of the study. Participants were asked to complete the questionnaires anonymously.

This study was approved by the Ethics Committee of the Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences on September 30, 2014 (receipt number 1057). With the approval of the Ethics Committee, we assumed that the return of questionnaires constituted informed consent.

## **Measures**

The Autism-Spectrum Quotient short form (AQ)

People with Autism Spectrum Disorder scored highly on the AQ. The long version of the AQ comprises 50 items on a 4-point Likert scale ranging from 1 (*not at all*) to 4 (*very well*), with scores collapsed to a dichotomous scale (1 = 0; 2 = 0; 3 = 1; 4 = 1) and a maximum score of 50 in the original version. There are 5 classified subscales including attention-switching, social skills, communication skills, imagination, and local details (Baron-Cohen et al., 2001). The 28-item AQ Short Form (AQ-S) was developed and its validity examined by Murray et al (Murray et al., 2014). The AQ-S uses the same 4-point Likert scale as the AQ long version, but retains the full 4-point scoring scale (1-2-3-4), thereby rendering a maximum score of 112. In the present study, we adapted the AQ-S (Murray et al., 2014; Wakabayashi et al., 2004). The cut-off point

for screening ASD in the short versions validated by Murray was 64/65 with sensitivity and specificity of 0.97 and 0.82, respectively (Kuenssberg et al., 2014).

#### SHARE scale

The SHARE scale is the scale of confidence in communicating bad news to patients with cancer (Fujimori et al., 2014b) and is used to measure effects of CSTs in doctors (Tang et al., 2014). There are 36 items, and the four subscales described earlier: “setting up the supporting environment of the interview” [S (ENV)], “making consideration for how to deliver the bad news” [H (HOW)], “discuss about additional information” [A (ADD)], and “provision reassurance and addressing the patient’s emotion with empathic responses” [RE (EMP)]. These four elements represent communication skills based on patients’ preferences (Fujimori et al., 2014b). The scale has been validated with doctors who participated in a CST for conveying bad news (Fujimori et al., 2014b). In the present study, we revised the SHARE scale to enable comparison with previous findings accumulated in the field of patient-physician communication. We excluded items in the original SHARE scale that were not suited to rehabilitation therapists based on advice from researchers of communication in medical settings and rehabilitation therapists. For some items, ‘physician’ was changed to ‘rehabilitation therapist’. We selected 25 items from the full set of 36, omitting 11 items that were not suited to the work of rehabilitation therapists (for example, items related to treatment and diagnosis) (Fujimori et al., 2014b). In addition, we tested validity by confirming that the factor structure was identical to the original scale using the present data (confirmation factor analysis:  $\chi^2=3163.939$ , degree of freedom=269, GFI=0.826, NFI=0.836, CFI=0.847,

RMSEA=0.090). We also examined the internal consistency of the revised SHARE scale (Cronbach's alpha = 0.939).

#### Scale of difficulty in communication

We asked the participating rehabilitation therapists about the degree of difficulty they experienced in communicating with cancer patients, using a numerical rating scale (0–100, in increments of 10) (Fujimori et al., 2016; Hunt et al., 2014). The question was, "When a cancer patient asks you the following, is it difficult for you?: 'Will I ever be able to walk again?' 'Will I ever be able to live life the way I want to?' and 'Will I ever be able to eat with my mouth again?'" The content of that question was carefully selected to evaluate difficulty in the most distressing form of communication (giving bad news). The wording was determined by researchers who specialised in communication in medical settings and rehabilitation therapists to maximise the content validity. This question was sent to all rehabilitation therapist regardless of specialty (physical, occupational, or speech therapists), because we could not determine specialty at the time of the survey. This means that some rehabilitation therapists might have misunderstood the nature of the question.

#### General Health Questionnaire-12

The General Health Questionnaire-12 (GHQ-12) is self-administered screening instrument aimed at detecting a diagnosable psychiatric disorder. The 12-item tool produced results comparable to longer versions of the GHQ in a World Health Organization study of psychological disorders in general healthcare (Fukunishi, 1990). The GHQ uses the same 4-point Likert scale and dichotomous scoring method as

described for the AQ. The cut-off point showing the tendency of the mental disorder is >4 points (Kim et al., 2013).

### **Demographics**

Participants initially completed questions about their demographic and professional backgrounds, providing information about age; gender; what kind of rehabilitation therapist (physical therapist, occupational therapist, or speech therapist); number of years since qualification as a rehabilitation therapist; whether they worked in a cancer medical treatment cooperation base hospital or not; number of patients they treated in a day, and of those, the number who were cancer patients.

### **Hypothetical models**

We hypothesised two models (Models 1 and 2) and an additional sub-model (Model 3) expressing covariance structure analyses as follows: Model 1, that confidence in communication does not mediate associations between ALT status and difficulty in communication (Fig. 1, Model 1); and Model 2, that confidence in communication mediates associations between ALT status and difficulty in communication (Fig. 1, Model 2). Moreover, we additionally hypothesised Model 3, which allows that confidence in communication, as measured by the SHARE scale (Model 2), may influence the four elements of communication differently (Fig. 1, Model 3). As mental health status was an additional preliminary interest, we created Model 2b, which was derived from Model 2 and incorporated mental health status (Fig. 1, Model 2b). Our hypothesis was that Model 2b examined the relationship between communication difficulty and mental status as a secondary analysis. In all models, ALT was positioned

as the uppermost stream because ALT represents inborn traits. Communication difficulty was located after ALT, and we placed confidence between ALT and difficulty, based on the primary hypothesis of the present study that confidence in communicating mediates the relationship between ALT and communication difficulty.

### **Statistical analysis**

Covariance structure analysis of hypothetical models was performed using IBM SPSS AMOS, version 22 (IBM, Tokyo, Japan). We calculated the goodness of fit of the three models and expressed the result as  $\chi^2$ , degrees of freedom, significance probability, NFI (Normed Fit Index), CFI (Comparative Fit Index), RMSEA (Root Mean Square Error of Approximation), and AIC (Akaike Information Criterion). We also calculated each of the path coefficients in Models 1 and 2, and used them to investigate whether confidence in communication mediates the association between ALT status and difficulty in communication.

We explored the elements mediating between ALT status and difficulty in communication by examining each path coefficient between ALT status and confidence and between confidence and difficulty in communication. Other analyses were performed using IBM SPSS, version 22 (IBM, Tokyo, Japan). Alpha levels were set at  $p < 0.05$  (two-tailed). Cases with missing data were excluded because there was no clear rule for imputing the missing data in each questionnaire.

## **RESULTS**

### **Subjects**

After excluding rehabilitation therapists who met the exclusion criteria, we sent the questionnaire by mail to the remaining 2,768 eligible rehabilitation therapists. Of those, 1,373 replied (response rate was 49.6%). After excluding 30 with missing data for variables used in Models 1, 2, and 3, our data set included 1,343 (48.5%) cases for analysis (Fig. 2).

Table 2 shows the demographic summary of the participants. There were 746 (55.5%) males, with a mean age of  $37.0 \pm 7.7$  years and a mean of  $13.2 \pm 7.3$  years of clinical experience. Participants who reported their levels of difficulty in communication with cancer patients as low (scores of 0–30), moderate (scores of 40–60), and high (scores of 70–100) were 13.5%, 33.2%, and 53.3%, respectively. A large majority of participants (66.3%) exceeded the GHQ cut-off score of 4 points, showing the tendency of the mental disorder. Additional data and descriptive statistics are shown in Table 2.

### **Goodness of fit and path coefficients**

Hypothetical Models 1, 2, and 3 were saturation models. In hypothetical Model 2b, goodness of fit indexes were:  $\chi^2 = 2.809$ , degrees of freedom = 1, significance probability = 0.094, GFI = 0.999, AGFI = 0.989, NFI = 0.994, CFI = 0.996, RMSEA = 0.037, and AIC = 20.809. All hypothetical models were fit models (Figs. 3, 4).

Figure 3 shows the path coefficients for Models 1, 2, and 3. The path coefficient of ALT on difficulty in communication going through confidence in communication was 0.062, the result of multiplying the path coefficient of ALT on

confidence in communication (-0.39) and that of confidence in communication on difficulty in communication (-0.16) (Fig. 3, Model 2).

We investigated Model 3, in which we divided the confidence in communication scale into the four elements that reflect patients' preferences in communication with medical staff [S (ENV), H (HOW), A (ADD), and RE (EMP)], and explored the path coefficients in this model (Fig. 3, Model 3).

The path coefficient of ALT's indirect effect on difficulty in communication through element S (ENV) was -0.053, which resulted from multiplying -0.33 and 0.16. The path coefficient through element H (HOW) was 0.074 (-0.35 multiplied by -0.21). The path coefficient through element A (ADD) was 0.011 (-0.27 multiplied by -0.04); and the path coefficient through element RE (EMP) was 0.023 (-0.38 multiplied by -0.06) (Fig. 3, Model 3).

The path coefficient for communication difficulty on the GHQ was 0.16 (Fig 4, Model 2b).

## **DISCUSSION**

The present study with more than 1,000 participants investigated the association between ALT and difficulty in communication with cancer patients in rehabilitation therapists. And this is the first study showing the association within our knowledge.

Although the path coefficient that reflects the association between ALT and difficulty in communication mediated by confidence of communication in Model 2 was small (0.062), it constituted 3/5 of the path coefficient between ALT and difficulty in communication (0.10) (Fig. 3, Model 2). Although this study was cross-sectional and causality cannot be determined, the findings indicated that 3/5 of the difficulties in

communication related to ALT may be ameliorated by the path of confidence in communication.

We revealed some confidence elements associated with both ALT and difficulty in communication in Model 3. Confidence was categorized into four elements, and the mediating effects of these four elements were different (Fig. 3, Model 3). The path coefficient between ALT status and difficulty in communication was a negative value (-0.053) for element S (ENV), as described in the Results section (Fig. 3, Model 3). One interpretation of this finding is that rehabilitation therapists with high levels of ALT perceived low confidence in element S (ENV) and low difficulty in communication via element S (ENV), and that the reverse was true for rehabilitation therapists with low levels of ALT. However, it is necessary to consider the unique character of 'S' in comparison with other factors in a future study.

Model 3 showed that an association between higher confidence in element S (ENV) and high difficulty in communication influenced confidence in elements H (HOW), A (ADD) and RE (EMP) on associations that would be fixed and then excluded. If confidence in element S was high and confidence in the other elements (H, A and RE) was low, difficulty in communication may become worse (Fig. 3, Model 3). If only S was increased by CST that aimed to increase confidence, it may unexpectedly have an undesirable result of increasing difficulty in communication. Limiting consideration to rehabilitation therapists setting the environment of communication without information required from patients and without emotional communication with patients with an empathic attitude may increase patients' distress, and in turn increase rehabilitation therapists' distress. Other factors may also be beneficial to patients, and

mean that the distress of rehabilitation therapists may not be increased. However, the present findings did not reveal precise mechanisms.

In contrast, the path coefficient that reflects mediation by element H (HOW) between ALT and difficulty in communication was positive (0.074) (Fig. 3, Model 3). This means that the rehabilitation therapists with higher ALT status perceived more difficulty in communicating with patients. Therefore, a CST for increasing confidence in element H (HOW) may be recommended from the standpoint of both confidence and difficulty in communication.

Meanwhile, coefficients mediated by elements A (ADD) and RE (EMP) were small, suggesting that changing these elements may not influence the association between ALT and difficulty in communicating with patients with cancer. Although neither element had a mediating effect on the association between ALT and difficulty in communication with patients with cancer, these elements may be important skills to train because all of the elements were derived from patients' preferences regarding the communication style of medical staff, and CSTs for medical staff have been shown to increase patients' satisfaction with communication and subsequently to decrease depressed mood in patients with cancer (Fujimori et al., 2014b).

In the present study, rehabilitation therapists with a high level of communication difficulty also had poor mental status (Fig. 4, Model 2b). Previous studies have clarified poor mental health among medical staff (Higuchi et al., 2015; Higuchi et al., 2016), and the results of the present study are consistent with those studies. Although mental health status as measured by the GHQ may reflect various factors of daily living, our path analysis indicated that to some extent, it may also be related to communication difficulty. Higuchi et al. reported high ALT was related to

poor mental health as assessed by GHQ in pharmacists (Higuchi et al., 2015; Higuchi et al., 2016), which is consistent with the results of the present study. Therefore, a high prevalence of poor mental health may be related to a high level of ALT among rehabilitation therapists in the present study. However, exact reasons, including for high ALT, are unclear from the present findings.

## **CONCLUSION**

High levels of ALT appear to be associated with rehabilitation therapists' communication difficulties with patients with cancer. In addition, confidence in communication mediates the relationship between difficulties in communication and ALT. However, higher confidence in creating a supportive atmosphere was associated with more difficulty in communication. Therefore, CSTs aiming to increase confidence in communication for rehabilitation therapists with high levels of ALT should be developed carefully, with particular vigilance toward avoiding unwanted effects. Further study is necessary to devise an intervention based on the present findings and to confirm its effectiveness.

## **PRACTICE IMPLICATIONS**

Recently, rehabilitation therapists have become involved in cancer rehabilitation and therefore require communication skills to support cancer patients emotionally; however, no CST that increases the ability to provide emotional support for cancer patients has been developed for rehabilitation therapists. When we develop CST, the portion of training that focuses on creating a supportive environment for communication must be

approached with care to avoid the reverse effect of increasing rehabilitation therapists' communication difficulties, especially for rehabilitation therapists with high ALT.

## **LIMITATIONS**

There are several limitations in the present study. First, causality between variables cannot be determined conclusively, because the study design is cross-sectional. Thus, longitudinal observational and/or intervention studies are needed. Second, the response rate was less than 50%; therefore, selection bias may have been present. The high prevalence of high ALT and poor mental health might have been caused by selection bias. Third, the validity of the revised SHARE scale was not examined sufficiently, although the scale was confirmed to have a four-factor structure identical to the original SHARE scale, and the internal consistency was high. In addition, the single scale of difficulty in communication had not been validated, although it was created by researchers who specialised in communication. All scales were self-reported, and scores might have been influenced by mental status at the time of the survey.

## **ACKNOWLEDGEMENTS**

This work was supported in part by Research for Promotion of Cancer Control Programmes [H26-political-general-002] Health and Labour Sciences Research Grants from the Ministry of Health, Labour and Welfare, Japan. The authors thank the all participants, and also wish to express their gratitude for the enormous help of Shoko Yoshimoto for funds management and Yifei Tang for excellent data management. We are grateful to Life Planning Centre for their assistance with posting questionnaire to the participants.

## REFERENCES

- Akizuki, N., Shimizu, K., Asai, M., Nakano, T., Okusaka, T., Shimada, K., Inoguchi, H., Inagaki, M., Fujimori, M., Akechi, T. & Uchitomi, Y. (2016). Prevalence and predictive factors of depression and anxiety in patients with pancreatic cancer: a longitudinal study. *Jpn J Clin Oncol*, *46*(1), 71-77.
- American Psychiatric Association (2013). DSM-5th: Diagnostic and Statistical Manual of Mental Disorders, 5th ed Washington DC. *original publication*.
- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev*, *84*(2), 191-215.
- Baron-Cohen, S., Wheelwright, S., Skinner, R., Martin, J. & Clubley, E. (2001). The autism-spectrum quotient (AQ): evidence from Asperger syndrome/high-functioning autism, males and females, scientists and mathematicians. *J Autism Dev Disord*, *31*(1), 5-17.
- Fujimori, M., Akechi, T. & Uchitomi, Y. (2016). Factors associated with patient preferences for communication of bad news. *Palliat Support Care*, 1-8.
- Fujimori, M., Shirai, Y., Asai, M., Akizuki, N., Katsumata, N., Kubota, K. & Uchitomi, Y. (2014a). Development and preliminary evaluation of communication skills training program for oncologists based on patient preferences for communicating bad news. *Palliat Support Care*, *12*(5), 379-386.
- Fujimori, M., Shirai, Y., Asai, M., Kubota, K., Katsumata, N. & Uchitomi, Y. (2014b). Effect of communication skills training program for oncologists based on patient preferences for communication when receiving bad news: a randomized controlled trial. *J Clin Oncol*, *32*(20), 2166-2172.
- Fukunishi, I. (1990). Nihongoban General Health Questionnaire (GHQ) no cut-off point (The assessment of cut-off point of the General Health Questionnaire (GHQ) in the Japanese version). *Clin. Psychol. published in Japanese*, 228-234.
- Higuchi, Y., Inagaki, M., Koyama, T., Kitamura, Y., Sendo, T., Fujimori, M., Uchitomi, Y. & Yamada, N. (2016). A cross-sectional study of psychological distress, burnout, and the associated risk factors in hospital pharmacists in Japan. *BMC Public Health*, *16*, 534.
- Higuchi, Y., Uchitomi, Y., Fujimori, M., Koyama, T., Kataoka, H., Kitamura, Y., Sendo, T. & Inagaki, M. (2015). Exploring autistic-like traits relating to empathic attitude and psychological distress in hospital pharmacists. *Int J Clin Pharm*, *37*(6), 1258-1266.

- Hunt, M.A., Takacs, J., Hart, K., Massong, E., Fuchko, K. & Biegler, J. (2014). Comparison of mirror, raw video, and real-time visual biofeedback for training toe-out gait in individuals with knee osteoarthritis. *Arch Phys Med Rehabil*, 95(10), 1912-1917.
- Karitsky, A.P., Chulkova, V.A., Pestereva, E. & Semiglazova, T.Y. (2015). [Rehabilitation of cancer patients as a basis for improving the quality of life]. *Vopr Onkol*, 61(2), 180-184.
- Kawamura, Y., Takahashi, O. & Ishii, T. (2008). Reevaluating the incidence of pervasive developmental disorders: impact of elevated rates of detection through implementation of an integrated system of screening in Toyota, Japan. *Psychiatry Clin Neurosci*, 62(2), 152-159.
- Kerr, J., Engel, J., Schlesinger-Raab, A., Sauer, H. & Holzel, D. (2003). Communication, quality of life and age: results of a 5-year prospective study in breast cancer patients. *Ann Oncol*, 14(3), 421-427.
- Kim, Y.J., Cho, M.J., Park, S., Hong, J.P., Sohn, J.H., Bae, J.N., Jeon, H.J., Chang, S.M., Lee, H.W. & Park, J.I. (2013). The 12-item general health questionnaire as an effective mental health screening tool for general korean adult population. *Psychiatry Investig*, 10(4), 352-358.
- Kuenssberg, R., Murray, A.L., Booth, T. & McKenzie, K. (2014). Structural validation of the abridged autism spectrum quotient-short form in a clinical sample of people with autism spectrum disorders. *Autism*, 18(2), 69-75.
- Lundstrom, S., Chang, Z., Rastam, M., Gillberg, C., Larsson, H., Anckarsater, H. & Lichtenstein, P. (2012). Autism spectrum disorders and autistic like traits: similar etiology in the extreme end and the normal variation. *Arch Gen Psychiatry*, 69(1), 46-52.
- Moore, P.M., Rivera Mercado, S., Grez Artigues, M. & Lawrie, T.A. (2013). Communication skills training for healthcare professionals working with people who have cancer. *Cochrane Database Syst Rev*, (3), CD003751.
- Murray, A.L., Booth, T., McKenzie, K., Kuenssberg, R. & O'Donnell, M. (2014). Are autistic traits measured equivalently in individuals with and without an autism spectrum disorder? An invariance analysis of the Autism Spectrum Quotient Short Form. *J Autism Dev Disord*, 44(1), 55-64.
- Okamura, H. (2011). Importance of rehabilitation in cancer treatment and palliative medicine. *Jpn J Clin Oncol*, 41(6), 733-738.
- Pranjic, N., Bajraktarevic, A. & Ramic, E. (2016). Distress and Ptsd in Patients with Cancer: Cohort Study Case. *Mater Sociomed*, 28(1), 12-16.

- Razavi, D., Delvaux, N., Marchal, S., Durieux, J.F., Farvacques, C., Dubus, L. & Hogenraad, R. (2002). Does training increase the use of more emotionally laden words by nurses when talking with cancer patients? A randomised study. *Br J Cancer*, *87*(1), 1-7.
- Tang, W.R., Chen, K.Y., Hsu, S.H., Juang, Y.Y., Chiu, S.C., Hsiao, S.C., Fujimori, M. & Fang, C.K. (2014). Effectiveness of Japanese SHARE model in improving Taiwanese healthcare personnel's preference for cancer truth telling. *Psychooncology*, *23*(3), 259-265.
- Wakabayashi, A., Tojo, Y., Baron-Cohen, S. & Wheelwright, S. (2004). [The Autism-Spectrum Quotient (AQ) Japanese version: evidence from high-functioning clinical group and normal adults]. *Shinrigaku Kenkyu*, *75*(1), 78-84.
- Willems, R.A., Bolman, C.A., Mesters, I., Kanera, I.M., Beaulen, A.A. & Lechner, L. (2017). Short-term effectiveness of a web-based tailored intervention for cancer survivors on quality of life, anxiety, depression, and fatigue: randomized controlled trial. *Psychooncology*, *26*(2), 222-230.
- World Health Organization (1992). The ICD-10 Classification of Mental and Behavioral Disorders: Clinical descriptions and diagnostic guideline (blue book). *World Health Organization*.