

Barriers to and Facilitators of Return to Work in Head and Neck Cancer Patients within the First Six Months Post-Treatment

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Abstract

Objective

To identify the factors associated with barriers to and facilitators of return to work (RTW) in head and neck cancer (HNC) patients in the first six months post-treatment.

Methods

This cross-sectional study examined HNC patients who completed treatment from the outpatient radiation department of a single cancer center in northern Taiwan from October 2018 to July 2020. Demographic and clinical characteristics were recorded, and patients were assessed using the Return to Work Barrier Scale, Return to Work Facilitator Scale, Distress Thermometer, Numeric Rating Scale, and Karnofsky Performance Status Scale questionnaires.

Results

Of the 106 HNC patients surveyed, 54.7% successfully RTW. Barriers to RTW included patient-perceived worst health status, greater symptom burden, and age ≥ 55 years. These factors explained 34.6% of the variance in overall barriers to RTW. Facilitators of RTW were lower psychological distress and who did not receive reconstruction surgery. These factors explained 17.9% of the variance in facilitators to RTW.

Conclusion

Patient-perceived health status and age most strongly influence RTW in HNC patients. HNC patients who can RTW should be encouraged to do so, and clinician awareness of potential barriers can aid patients in their RTW.

Introduction

Head and neck cancer (HNC) is among the most common types of cancer. HNC refers to cancers which develop in the head and neck region, including the nasal cavity, oral cavity, pharynx, larynx, and salivary gland [1, 2]. HNC accounts for 3% of all cancers in the United States, with approximately 53,000 US citizens developing HNC annually and 10,800 dying from the disease [1]. In Taiwan, approximately 6,000 HNC cases are diagnosed annually [3], many of whom are of working-age [4] and a main source of family income.

Disease progression and the adverse effects of treatment impact the ability of HNC patients to transition back to work after completing treatment, especially in those who perform manual labor [5, 6]. Return to work (RTW) refers to the ability or preparation of an individual to return to a job after a cancer diagnosis

or during or after treatment [6–8]. RTW can optimize recovery [9], help patients maintain their personal identity [10, 11], promote psychosocial well-being [12], and enhance the development of a healthy lifestyle [12].

The sequelae of treatment often affect the ability of HNC patients to work. The rate of RTW varies; 65.6–83% of patients RTW within 6 months [13, 14] and 48% RTW within one year after treatment [15]. Patients who RTW earlier benefit from the greater perceived health associated with work, more connections in their social relationships, and a decline in the financial impact of the disease [16, 17].

Barriers to RTW following HNC include the adverse effects of treatment such as fatigue, speech and eating problems, pain, changes in appearance [13, 16], and psychological and health-related distress [13, 16]. Factors shown to facilitate and support a RTW of cancer patients include co-workers' assistance [17], flexible schedules [18], support from employers [17], a friendly work environment, and positive employment policies [17].

Although previous studies have explored these issues, most research has focused on patients who survived head and neck cancer (HNC) [5, 20, 21], data from Western countries [14, 22] or India [13], qualitative research [23], and the perspective of peers and employer [24]. Therefore, the purposes of this study were to: (1) examine the status of RTW in working-age HNC patients within six months of ending treatment; (2) compare the levels of symptom burden, psychological distress, patient-perceived health status, barriers to RTW, and facilitators of RTW of those who did and did not RTW; and (3) identify the factors associated with barriers to and facilitators of RTW in HNC patients within the first six months post-treatment.

Methods

Design and sample

A cross-sectional, descriptive, and correlational design was used in this study. Consecutive sampling was conducted to recruit subjects from the otolaryngology, plastic/reconstructive surgery, and radiation oncology outpatient departments of a medical center in northern Taiwan between October 2018 and July 2021. The inclusion criteria were: (1) new diagnosis of HNC; (2) part-time or full-time employment at the time of cancer diagnosis; (3) completion of treatment within the past 6 months; and (4) aged 20–64.5 years (retirement age in the Taiwan is 65 years). Patients were not eligible to participate if they had a mental disorder, an unstable systemic disease (active infection or other underlying disease), recurrent HNC, or physical performance <60 on the Karnofsky Performance Status Scale (KPS) [25].

Ethical considerations

The study was approved by the medical center Institutional Review Board (Number: 201801245B0) and was found to conform to the principles of the Declaration of Helsinki. Following a detailed explanation of

the study and its procedures, subjects who agreed to participate were asked to provide signed informed consent before data collection.

Data Collection

After completing treatment, HNC patients regularly make follow-up visits with the otolaryngology, plastic/reconstructive surgery, or radiation oncology outpatient departments. Participants who met the inclusion criteria filled in the structured questionnaires by self-report in the consulting rooms. The interview lasted approximately 10 to 15 minutes.

Measures

Return to Work Barrier Scale

The Return to Work Barrier Scale (RTWBS) was used to assess the barriers to RTW [26]. The 17-item scale includes two subscales: the impact of cancer and its treatment (9 items) and cognitive and emotional representations of illness (8 items). Each item is scored from 0 to 7, with higher scores indicating a greater barrier to RTW. Previous studies using the RTWBS have indicated that this instrument has good test-retest reliability, concurrent validity, predictive validity, and discriminant validity [26]. The RTWBS was translated into Chinese, and five HNC and cancer care experts confirmed its content validity. The Cronbach's alpha for the RTWBS was 0.85.

Return to Work Facilitator Scale

The Return to Work Facilitator Scale (RTWFS) was developed based on HNC patients' RTW experiences derived from literature review [12, 27, 28] and a previous study [5]. Each item is scored on a scale of 1 to 5, with a higher score indicating greater facilitation of RTW. The content validity index was evaluated by five experts with working experience in HNC-related cancer care and was determined to be 0.98. The Cronbach's alpha for the RTWFC data was 0.88.

Distress Thermometer

The Distress Thermometer (DT), used to assess the level of psychological distress [29]. The DT is a visual analog scale that participants use to rate their level of distress over the preceding 7 days; scores range from 0 (none) to 10 (extreme). A previous study has determined that a cut-off score of 4 or greater indicates distress [30]. A previous study confirmed the validity of the Chinese version of the DT [31].

Numeric Rating Scale

The Numeric Rating Scale (NRS) was used to assess patients' symptom burden and health status. The NRS is a unidimensional measure of various symptoms or problems [32, 33]. The NRS is a horizontal bar or line with whole numbers (0–10 integers) used to reflect the intensity of the patient's symptom or problem, with 0 indicating "no such symptom or problem at all" and 10 indicating "extreme severity of the symptom or problem" [32]. For each symptom or problem, the patient's subjective perception is rated as low (NRS score ≤ 3), moderate (NRS score 4–6), or high (NRS score ≥ 7) [32]. In this study, subjects were

asked to rate their level of symptom burden and their perception of their health status. The NRS has been tested and shown to have satisfactory psychometric properties [32].

Karnofsky Performance Status Scale

Patients' performance status was measured using the KPS, which ranges from 100% (normal function) to 0% (death) [25]. KPS has been widely used, and previous studies have reported it to be reliable for studies of cancer patients in Taiwan [5]. An inter-observer reliability coefficient of 0.99 was reported in the present study.

Demographic and Clinical Characteristics

The demographic data included age, sex, employment status at diagnosis, marital status, education level, and type of occupation (unskilled/semi-skilled worker; skilled worker; clerk/shop owner/farm owner; semi-professional; professional). Clinical characteristics included cancer subsite, cancer stage, medical treatment, and time since the completion of treatment.

Statistical analysis

SPSS version 26.0 (IBM Corp., Armonk, NY, USA) was used for data analysis. Descriptive statistics were used to summarize patient demographic and clinical characteristics. Chi-square test, Fisher's exact test, and independent t-test were used to test the homogeneity between patients who did and did not RTW, as well as the differences in symptom burden, psychological distress, patient-perceived health status, barriers to RTW, and facilitators of RTW. The 10 top-ranked barriers to RTW of patients who did and did not RTW were selected as "the top 10 significant barriers to RTW" and were measured using the RTWBS [26]. Multiple regression analysis was conducted to identify the factors associated with barriers to RTW and facilitators of RTW. The independent variables included age (≤ 54 years vs. ≥ 55 years), time since the completion of treatment, education level, reconstruction surgery (no vs. yes), symptom burden, psychological distress, and patient-perceived health status.

Results

Patients characteristics

Of 108 eligible patients initially recruited, two declined to participate because they had no time or interest, for a response rate of 98.2%. We classified patients into the not RTW group, which included those who quit their job after diagnosis or took a leave of absence, sick leave, or an early retirement; and the RTW group, which included those who returned to the same work or changed into another line of work. Of the 106 patients studied, 48 (45.3%) did not RTW and 58 (54.7%) did. The two groups did not differ significantly in age, marital status, cancer stage, type of treatment, or performance status (KPS). Those who did not RTW were more likely to be female ($p = 0.002$), have a less than senior high school education ($p = 0.036$), have cancer of the oral cavity ($p = 0.027$), and have a shorter time since the completion of treatment (<5 months) ($p = 0.002$) (Table 1).

Table 1
Patient characteristics ($N=106$)

Variable	Not RTW (n=48)	RTW (n=58)	χ^2/t	p
	N(%) / Mean(SD)	N(%) / Mean (SD)		
Age (years)	52.23(7.47)	52.10(7.83)	0.084	0.933
Sex				
Male	46(95.8)	57(98.3)	0.570	0.020
Female	2(4.2)	1(1.7)		
Marital status			1.094	0.295
Unmarried	16(33.3)	14(24.1)		
Married	32(66.7)	44(75.9)		
Education level			8.520	0.036 ^a
Elementary	4(8.3)	10(17.2)		
Junior high	24(50.0)	15(25.9)		
Senior high	18(37.5)	25(43.1)		
College and above	2(4.2)	8(13.8)		
Types of occupation			8.620	0.013
Unskilled/ semi-skilled worker	36(75.0)	20(51.7)		
Skilled worker	12(25.0)	22(37.9)		
Clerk, shop, owner, farm owner	0(0)	6(10.3)		
Semi-professional	0(0)	0(0)		
Professional	0(0)	0(0)		
Status of return to work			—	—

SD, Standard Deviation.

RT, radiotherapy.

CCRT, concurrent chemoradiation therapy.

KPS, Karnofsky Performance Status.

^a Fisher's exact test.

Variable	Not RTW (n=48)	RTW (n=58)	χ^2/t	<i>p</i>
	N(%) / Mean(SD)	N(%) / Mean (SD)		
Not return to work	48(100)	—		
- Quit job after diagnosis	40(83.3)	—		
- Leave of absence	2(4.2)	—		
- Sick Leave	4(8.30)	—		
- Early retirement (pension)	2(4.2)	—		
Return to work	—	58(100)	—	—
- Return to same work	—	53(91.4)		
- Changed work	—	5(8.6)		
Tumor site			17.346	0.027 ^a
Oral cavity	44(91.3)	46(79.3)		
Hypopharynx	4(8.3)	9(15.5)		
Larynx	0(0)	3(5.2)		
Cancer stage			3.693	0.158
II	5(10.4)	10(17.2)		
III	5(10.4)	12(20.7)		
IV	38(79.2)	36(62.1)		
Medical treatment			2.180	0.336 ^a
Surgery + RT	23(47.9)	18(31.0)		
Surgery + CCRT	21(43.8)	26(44.8)		
CCRT	4(8.3)	14(24.1)		

SD, Standard Deviation.

RT, radiotherapy.

CCRT, concurrent chemoradiation therapy.

KPS, Karnofsky Performance Status.

^a Fisher's exact test.

Variable	Not RTW (n=48)	RTW (n=58)	χ^2/t	<i>p</i>
	N(%) / Mean(SD)	N(%) / Mean (SD)		
KPS score (level)	99.38(2.45)	100(0.00)	-1.948	0.054
90	3(6.3)	56(58.3)		
100	45(93.8)	100(100)		
Time since the completion of treatment (months)	4.72(1.48)	5.42(1.56)	-2.362	0.020
<i>SD</i> , Standard Deviation.				
<i>RT</i> , radiotherapy.				
<i>CCRT</i> , concurrent chemoradiation therapy.				
<i>KPS</i> , Karnofsky Performance Status.				
^a Fisher's exact test.				

Differences in symptom burden, psychological distress, patient-perceived health status, barriers to RTW, and facilitators of RTW in patients who did and did not RTW

Patients did not RTW had higher levels of symptom burden ($t = 3.945, p<0.05$), psychological distress ($t = 6.364, p<0.05$), barriers to RTW ($t = 2.650, p<0.05$), cancer and treatment impact barriers ($t = 2.595, p<0.05$), cognitive and emotional representations illness barriers ($t = 2.118, p<0.05$), lower facilitators of RTW ($t = -13.145, p<0.05$), employer support ($t = -4.960, p<0.05$), coworker support ($t = -9.647, p<0.05$), positive communication ($t = -8.025, p<0.05$), positive workplace ($t = -1.220, p>0.05$), and positive employment policy ($t = -1.372, p>0.05$) than those who did RTW (Table 2).

Table 2

Differences in symptom burden, psychological distress, patient-perceived health status, barriers to RTW, and facilitators of RTW in patients who did and did not RTW ($N=106$)

Variable	Not return to work (n=48)		Return to work (n=58)		<i>t</i>	<i>p</i>
	Mean	SD	Mean	SD		
Symptom burden (NRS)	32.08	11.66	24.83	7.07	3.945	0.001
Psychological distress (DT)	7.40	1.54	5.45	1.59	6.364	0.001
Patient-perceived health status (NRS)	34.38	4.69	31.84	4.18	- 0.567	0.572
Barriers to RTW (RTWBS)	71.56	7.43	67.17	9.28	2.650	0.009
- Cancer and treatment impact	39.10	4.91	36.43	5.57	2.595	0.011
- Cognitive and emotional representations illness	32.46	3.81	30.74	4.42	2.118	0.037
Facilitators of RTW (RTWFC)	9.63	1.75	13.72	1.40	-13.145	0.001
- Employer support	2.15	0.71	2.78	0.59	- 4.960	0.001
- Coworker support	2.25	0.53	3.19	0.48	- 9.647	0.001
- Positive communication	1.94	0.73	2.91	0.47	- 8.025	0.001
- Positive workplace	1.79	0.46	1.93	0.67	- 1.220	0.225
- Positive employment policy	1.40	0.49	1.53	0.70	- 1.3720	0.173

SD, standard deviation.

NRS, Numeric Rating Scale.

DT, Distress Thermometer.

RTWBS, Return to Work Barrier Scale.

RTWFC, Return to Work Facilitator Scale.

* $p<0.05$, ** $p<0.001$

Differences in the top-ranked and mean barriers of RTW and not RTW patients

In patients who did not RTW, the top five barriers to RTW were "fatigue or feeling exhausted" (mean=4.88, standard deviation [SD]=1.88), "level of performance" (mean=4.83, SD=0.69), "degree to which employee will experience cancer symptoms at work" (mean=4.75, SD=0.67), "physical symptoms" (mean=4.69, SD=0.88), and "emotional distress" (mean=4.65, SD=1.08). In patients who did RTW, the top five barriers

to RTW were “physical symptoms” (mean=4.60, SD=1.06), “fatigue or feeling exhausted” (mean=4.59, SD=1.12), “level of performance” (mean=4.53, SD=1.02), “degree to which employee will experience cancer symptoms at work” (mean=4.50, SD=0.94), and “degree of concern over cancer returning” (mean=4.24, SD=1.19) (Table 3).

Table 3
Differences in the top-ranked and mean barriers of RTW and not RTW patients ($N = 106$)

Variable	Domain of Barriers to RTW	Not return to work (n=48)		Return to work (n=58)		<i>t</i>	<i>p</i>
		Mean	SD	Mean	SD		
1. Fatigue or feeling exhausted	Cancer and treatment impact	4.88	1.88	4.59	1.12	0.980	0.329
7. Level of performance	Cancer and treatment impact	4.83	0.69	4.53	1.02	1.734	0.086
14. Degree to which employee will experience cancer symptoms at work	Cognitive and emotional representations illness	4.75	0.67	4.50	0.94	1.545	0.125
3. Physical symptoms	Cancer and treatment impact	4.69	0.88	4.60	1.06	0.439	0.662
2. Emotional distress	Cancer and treatment impact	4.65	1.08	3.90	1.07	3.569	0.001
6. The unpredictability of cancer	Cancer and treatment impact	4.54	0.92	4.14	1.15	2.010	0.047
4. Low confidence	Cancer and treatment impact	4.54	1.09	3.91	1.10	2.941	0.004
13. Degree to which cancer treatment impairs employee's ability to work	Cognitive and emotional representations illness	4.50	0.88	4.17	0.99	1.804	0.074
15. Degree of concern over cancer returning	Cognitive and emotional representations illness	4.48	1.03	4.24	1.19	1.102	0.273
11. Degree to which work is affected by cancer	Cognitive and emotional representations illness	4.23	0.97	3.98	0.98	1.291	0.199

Factors associated with barriers to RTW and facilitators of RTW

Multiple regression analysis identified the factors significantly and independently associated with barriers to RTW, two dimensions of barriers to RTW, and facilitators of RTW (Table 4). Patients who perceived that they had the worst health status ($\beta = -0.346$), who had greater symptom burden ($\beta = 0.241$), and who were ≥ 55 years ($\beta = -0.207$) were more likely to have greater overall barriers to RTW. These three factors explained 34.6% of the total variance in overall barriers to RTW. In terms of the cancer and treatment impact on RTW, barriers to RTW were patient-perceived worst health status ($\beta = -0.386$), and those who received reconstruction surgery ($\beta = 0.213$). These two factors explained 21.9% of the total variance in cancer and treatment impact on barriers to RTW. Greater cognitive and emotional barriers to RTW were correlated with patient-perceived worst health status ($\beta = -0.484$), greater symptom burden ($\beta = 0.273$), and being aged ≥ 55 years ($\beta = -0.216$). These three factors explained 35.2% of the total variance in cognitive and emotional barriers to RTW. Patients who had lower psychological distress ($\beta = -0.360$) and who did not receive reconstruction surgery ($\beta = -0.200$) were more likely to have more facilitators to RTW. These two factors explained 17.9% of the total variance in facilitators to RTW (Table 4).

Table 4
Factors associated with barriers to RTW and facilitators of RTW ($N = 106$)

Domains of barriers to TRW	Predictive variable	Adjusted R ²	Beta	F	p	95% CI	
						Lower	Upper
Overall barriers to RTW (RTWBS)	Patient-perceived health status	0.346	-0.499	19.493	0.001	-0.179	-0.093
	symptom burden		0.241		0.003	0.057	0.271
	Age (≤ 54 years vs. ≥ 55 years)		-0.207		0.010	-0.416	-1.058
	Constant				0.001	71.256	91.572
Cancer and treatment impact on RTW (RTWBS)	Patient-perceived health status	0.219	-0.386	15.718	0.001	-0.095	-0.036
	Reconstruction (no vs. yes)		0.213		0.018	0.465	4.943
	Constant				0.001	35.536	40.367
Cognitive and emotional barriers to RTW (RTWBS)	Patient-perceived health status	0.352	-0.484	20.048	0.001	-0.084	-0.043
	symptom burden	0	0.273		0.001	0.039	0.141
	Age (≤ 54 years vs. ≥ 55 years)		-0.216		0.007	-0.205	-0.033
	Constant				0.001	32.408	42.183
Facilitators of RTW (RTWFC)	Psychological distress	0.179	-0.360	12.462	0.001	-0.753	-0.255
	Reconstruction (no vs. yes)		-0.200		0.028	-2.285	-0.135
	Constant				0.001	14.275	17.690
RTWBS, Return to Work Barrier Scale.							
RTWFC, Return to Work Facilitator Scale.							
Input independent variable: covariates included age (≤ 54 years vs. ≥ 55 years), time since the completion of treatment (continuous score), educational level (continuous score), reconstruction (no vs. yes), symptom burden (continuous score), psychological distress (continuous score), and patient-perceived health status (continuous score).							

Discussion

In the present study, 54.7% of HNC patients did RTW within the first six months post-treatment, a much lower rate of RTW than that reported by Agarwal et al. [13]. The differences in RTW status may have been influenced by age and education level. In our study, those who did RTW had a mean age of 52.10 years and most patients had a junior high (25.9%) or senior high (43.1%) school education; only 13.8% had an educational level of college or above. In the study of Agarwal et al., [13] the HNC patients who did RTW had an average age of 47 years and 25.6% had a graduate or postgraduate school education. In Taiwan, most HNC patients are blue-collar workers who work in skilled or unskilled jobs requiring a relatively high level of physical fitness [5]. Nutrition counseling and physical training extending into the post-treatment period are needed for such workers to RTW.

The results of this study showed that RTW patients reported higher levels of employer support, coworker support, and positive communication than patients those who did not RTW. These results are consistent with those of earlier studies by Johnsson et al. [34] and Nilsson [35], which indicated that social support from employers and coworkers is crucially important for cancer patients to RTW. Although more than half of patients did RTW within six months post-treatment, the difficulties in interpersonal interaction and communication which HNC patients can experience can result in an inability or disinclination to RTW. Healthcare providers should be aware of HNC patients' coping strategies for communication and maintaining interpersonal relationships within the workplace, and seek to provide care that enables them to RTW.

The present study examined HNC patients within six months of ending treatment. Both those who did and did not RTW rated highly the barriers to RTW as "fatigue or feeling exhausted," "level of performance," "degree to which employee will experience cancer symptoms at work," and "physical symptoms." These results are consistent with those of previous studies [13], which reported fatigue as the most common problem for HNC patients who did and did not RTW, and also that it was the most important factor in their decision to discontinue work. Therefore, enhanced patient education, exercise, energy conservation, and proper nutrition and hydration during and after treatment can help relieve patient fatigue and promote physical fitness.

Results of the present study showed that patient-perceived health status and being aged ≥ 55 years were the most common factors associated with the overall barriers to RTW and cognitive and emotional barriers to RTW. These results are consistent with those of a previous study [36] which reported that younger age and good self-rated health are the primary facilitators of RTW. In addition, HNC patients typically will also have financial distress after diagnosis, which may cause greater symptom burden, decreased adherence to treatment recommendations, poorer health-related quality of life, and increased mortality risk [37, 38]. Health care providers should assess each patient's socioeconomic status and provide access to appropriate social resources in order to minimize financial distress and help patients have the resources they need to continue treatment.

Similar to the results of previous studies [16, 39, 40], we found that patients who did RTW had lower emotional distress, less symptom burden, and more confidence than those who did not RTW. HNC treatment-related adverse effects generate physical and psychological distress and negatively impact one's ability to work. Healthcare providers can help their patients by discussing the work-related and disease-related problems they are likely to encounter when they RTW, and designing an individualization rehabilitation program to reduce psychological distress and improve the patient's confidence in social interactions.

Limitations

This study had several limitations. First, the present study examined HNC patients in the first six months post-treatment, but RTW is a dynamic process that changes over time. Longitudinal or long-term follow-up studies are also needed to identify changes in employment status and the factors related to RTW. Second, the sample consisted only of patients from a single medical center in northern Taiwan, and may not fully account for the effect of the differences in geographical and sociological factors between countries. Future studies may expand subject recruitment to different locations in order to compare the variation in effect on RTW.

Conclusion

We found that 54.7% of HNC patients RTW within the first six months post-treatment. Patients who perceived that they had a worse health status, had greater symptom burden, and were aged ≥ 55 years had a greater overall barrier to RTW. Patient-perceived health status and age were the strongest factors affecting RTW.

Clinical implications

In the clinical care of HNC patients, addressing the barriers to and facilitators of RTW such as physical workload and work ability and incorporating the shared-care model can help patients in their decision to RTW.

Declarations

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Conflicts of interest/Competing interests: None declared.

Availability of data and material: The data that support the findings of this study are available from the corresponding author. Restrictions apply to the availability of these data, which were used under license for this study. Data are available from the authors with the permission of the Chang Gung Memorial Hospital Research Program (CMRP).

Code availability: Not applicable

Authors' contributions: All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE (<http://www.icmje.org/recommendations/>)]:

- substantial contributions to conception and design, acquisition of data or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

Study design: BSHuang& SC Chen; Data collection and analysis: BS Huang, CY Lin, YL Chang, CF Chang, & SC Chen; Manuscript preparation: BSHuang& SC Chen

Ethics approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the University of Wisconsin Health Sciences IRB (Number: 201801245B0) and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Consent to participate: Informed consent was obtained from all individual participants included in the study.

Consent for publication: This manuscript is original, is not plagiarized, and has not been published elsewhere.

This manuscript is not under consideration for publication in another journal, and will not be submitted elsewhere until the JSCC editorial process is completed.

All authors consent to the publication of the manuscript in JSCC, should the article be accepted by the Editor-in-chief upon completion.

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