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Research

Facial affect during remote WHOQOL-OLD interviews in very old adult day service users: a pilot correlational study

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Abstract

Background: Remote assessment of quality of life (QOL) may be useful in geriatric care, but little is known about observable facial responses during QOL interviews. **Aims:** To explore associations between WHOQOL-OLD scores and automated facial affect indices during remote interviews in very old adult day service users. **Method:** Eight Japanese adult day service users completed the Japanese WHOQOL-OLD via Zoom. Facial expressions during item responses were analyzed using Affdex. Pearson's and Spearman's correlations were calculated between WHOQOL-OLD scores, Affdex-derived indices, and Mini-Mental State Examination-Japanese version scores. **Results:** Past, present, and future activities showed consistent associations with greater anger, contempt, and confusion and lower valence. Social participation was inversely associated with sentimentality. Total QOL was positively associated with engagement. **Conclusions:** Remote WHOQOL-OLD interviews elicited domain-specific facial affect and engagement patterns. Automated facial analysis may provide supplementary observational information for geriatric QOL assessment.

Keywords

Adult Day Care Centres; Aged; Artificial Intelligence; Facial Expression; Quality of Life; Telemedicine

Introduction

Quality of life (QOL) is a central outcome in geriatric care because the health and well-being of older adults cannot be adequately understood from disease status, physical function, or cognitive scores alone. This is particularly true for very old adults who use adult day services, because such services support not only physical activity and social contact but also continuity of daily routines, meaningful participation, and subjective well-being.[1,2] In this context, QOL assessment can help clinicians and care providers understand how older adults perceive autonomy, social participation, life satisfaction, intimacy, sensory functioning, and concerns about death and dying. The WHOQOL-OLD is a structured instrument designed to assess age-relevant dimensions of QOL and has been used internationally to capture domains that are especially important in later life.[3,4]

However, self-report instruments capture what participants state verbally or select as questionnaire responses, but they do not fully capture how participants respond while answering. This distinction may be clinically important in very old adults, especially when questions require reflection on personal achievements, current activities, future prospects, dependence on others, or social connectedness. In routine geriatric care, clinicians and care staff often attend not only to verbal answers but also to facial expression, hesitation, engagement, and apparent emotional salience during conversation. Automated facial expression analysis may provide a way to quantify part of this observable response process. Systems such as Affdex generate algorithm-derived indices of facially expressed affect and behavioral engagement, including anger, contempt, disgust, fear, joy, sadness, surprise, sentimentality, confusion, neutral expression, engagement, valence, and attention.[5–7] These indices should not be interpreted as direct measurements of inner emotional experience, because facial expression is influenced by context, culture, interpersonal interaction, and measurement conditions.[5]

Remote assessment is also increasingly relevant in geriatric practice because videoconference-based assessment can reduce travel burden, improve access, and support continuity of evaluation when face-to-face assessment is difficult.[8,9] For older adults with cognitive decline, remote QOL assessment raises both opportunities and challenges: direct self-report remains important whenever possible, but clinicians may need additional observational information when verbal reporting becomes limited or inconsistent. Cognitive status may also influence how older adults understand, answer, and behaviourally respond during QOL interviews; therefore, we also examined the Japanese version of the Mini-Mental State Examination (MMSE-J) in relation to WHOQOL-OLD scores and facial response indices.[10-12]

However, little is known about how facially expressed affect during remote QOL interviews relates to self-reported QOL in very old adult day service users. The present pilot study, therefore, explored associations between WHOQOL-OLD domain scores and Affdex-

derived facial affect indices during remote interviews in Japanese very old adult day service users. Given the small sample size, the purpose was not to establish predictive models or causal relationships, but to characterize whether interpretable patterns of association could be observed between self-reported QOL domains and observable facial responses during remote assessment.

Methods

Study Design and Participants

This study used a cross-sectional pilot correlational design. Participants were recruited from a single adult day service context in Japan using a convenience sampling approach. Eligible users were those who were able to understand the study explanation, provide written informed consent, participate in a Zoom-based interview conducted in Japanese, and complete the Japanese version of the WHOQOL-OLD assessment. Before participation, the interviewer and care staff confirmed that each participant could communicate responses and tolerate the interview procedure.

The sample size was determined pragmatically because this was an exploratory pilot study designed to examine feasibility and preliminary association patterns rather than to test a confirmatory hypothesis. No formal a priori sample-size calculation was performed. Eight eligible users who provided written informed consent were included. Their mean age was 87 years, and the sample comprised seven women and one man. The mean MMSE-J score obtained within 1 week before the remote interview was 21.

Ethical Considerations

The study was approved by the SI Research Institute Ethics Committee, Tokyo, Japan (Approval No. 003). All participants received an explanation of the study purpose, procedures, video recording, facial expression analysis, voluntary participation, and data handling before participation. Written informed consent was obtained from all participants. Before the Zoom interview, the interviewer and care staff confirmed that each participant was able to understand the explanation, communicate responses, and take part in the interview procedure. Staff members were available to assist with the technical aspects of the remote interview and to reduce participant burden. Video data were handled only for research purposes and were analysed in a manner intended to protect participant confidentiality.

Procedure

The WHOQOL-OLD was administered individually via Zoom in Japanese by a native Japanese-speaking interviewer. During the interview, participants responded to all questionnaire items verbally in Japanese, and their facial expressions while answering were recorded for subsequent analysis. Video data were analysed using Affdex, as provided in Japan by CAC Corporation, based on Affectiva's facial expression analysis system.

To reduce technical variability during video recording, the interview was conducted with staff support for the Zoom connection and camera positioning. Before and during the interview, the participant's face was kept visible to the camera as far as possible, and lighting and camera angle were checked to the extent feasible in the care setting. Response periods in which the participant's face was not visible or the video was not analysable were excluded from the Affdex averaging procedure. No imputation was performed for non-analysable video segments.

For each of the six WHOQOL-OLD domains, the four item-response periods corresponding to that domain were identified. For each participant, each Affdex index was averaged across those four response periods to generate a domain-level summary value for that facial expression variable. For analyses involving the total WHOQOL-OLD score, participant-level summary values for each Affdex index were calculated across the interview as a whole.

This procedure aligned the facial expression variables with the same domain structure used for WHOQOL-OLD scoring, allowing each domain score to be compared with facially expressed affect observed while participants answered the corresponding four items.

Measures

WHOQOL-OLD

QOL was assessed using the Japanese version of the WHOQOL-OLD questionnaire.[10] This instrument comprises 24 items across six domains: Sensory Abilities, Autonomy, Past, Present and Future Activities, Social Participation, Death and Dying, and Intimacy.[3,4] English domain names are used throughout this manuscript for international readability, but all questionnaire items were administered and scored using the Japanese version. Each domain consists of four items rated on a 5-point scale. Domain scores were calculated as the sum of the four corresponding items, yielding a possible range of 4–20 for each domain, with higher scores indicating better QOL in that domain. The total WHOQOL-OLD score was calculated by summing all 24 items, yielding a possible range of 24–120.

MMSE-J

Cognitive status was described using the Japanese version of the Mini-Mental State Examination (MMSE-J) score obtained within 1 week before the WHOQOL-OLD interview. The MMSE is a widely used brief cognitive screening instrument,[11] and the MMSE-J has reported validity and reliability in Japanese older adults.[12] In the present study, MMSE-J was used as a descriptive cognitive indicator and was additionally examined in relation to the total WHOQOL-OLD score.

Affdex-Derived Facial Expression Indices

Facial expression during questionnaire responses was quantified using Affdex, as provided in Japan by CAC

Corporation. The following 13 Affdex indices were analysed: anger, contempt, disgust, fear, joy, sadness, surprise, sentimentality, confusion, neutral, engagement, valence, and attention.[6,7] Response periods were identified from the recorded interview videos based on the timing of each WHOQOL-OLD item and the participant's verbal response. Facial expression values were averaged only across analysable response periods in which the participant's face was visible to the camera.

In general, Affdex emotion and expression scores are output on a 0–100 scale, with higher scores indicating stronger algorithm-detected evidence of the corresponding facial expression. Engagement and attention were also treated as algorithm-derived behavioral response indices. Valence differs from the other indices because it is a bipolar composite score; negative values indicate relatively negative facial affective valence, values near zero indicate neutral valence, and positive values indicate relatively positive facial affective valence. These indices were treated as algorithm-derived indicators of facially expressed affect and behavioral engagement during the interview.[5]

Statistical Analysis

Pearson's correlation coefficients and Spearman's rank correlation coefficients were calculated to examine associations between WHOQOL-OLD scores and Affdex-derived facial expression indices. For each domain, correlations were computed between the domain score and the corresponding domain-level average of each Affdex index. Correlations were also calculated between the total WHOQOL-OLD score and interview-level summary values for each Affdex index. In addition, associations between WHOQOL-OLD scores and MMSE-J scores were examined. Pearson's coefficients were used to assess linear associations among quantitative variables, whereas Spearman's coefficients were used to examine rank-order monotonic associations. The two methods were interpreted together to evaluate the consistency of observed association patterns in this small sample.

Before correlation analysis, descriptive ranges and scatterplots were inspected to assess approximate linearity and potentially influential observations. No participant was excluded as an outlier. WHOQOL-OLD and MMSE-J scores were complete for all participants. Affdex values were averaged across analysable response periods only; non-analysable video segments were excluded, and no imputation was performed. Given the very small sample size, formal normality testing was not emphasized, and all correlation analyses were interpreted descriptively.

Because this was a pilot correlational study designed to characterize domain-specific response patterns, no formal multiplicity adjustment was applied. The analyses involved many correlations; therefore, all significance markers should be interpreted as nominal, and the possibility of chance findings was explicitly considered in interpretation. The interpretation focused on effect-size magnitude, direction of association, convergence between Pearson's and Spearman's coefficients, and clinical interpretability rather than on isolated p values. For the main Pearson correlation coefficients shown in Figure 1, 95% confidence intervals were calculated using Fisher's z transformation to illustrate the precision of the estimates.

Results

Participant Characteristics

Eight very old adult day service users participated in the study. Their mean age was 87 years, and the sample comprised seven women and one man. All interviews were conducted via Zoom (Table 1). Descriptive statistics for WHOQOL-OLD domain scores, total WHOQOL-OLD score, and MMSE-J score are shown in Table 2. The mean total WHOQOL-OLD score was 84 ± 10, and the mean MMSE-J score was 21 ± 6.7.

Table 1. Participant Characteristics of Very Old Adult Day Service Users

Characteristic	Value
Number of participants	8
Age, mean ± SD, years	87 ± 5.1
Age range, years	77–95
Sex, women	7 (87.5%)
Sex, men	1 (12.5%)
Interview modality	Zoom

Table 2. Descriptive statistics for WHOQOL-OLD and MMSE-J scores.

Measures	Mean ± SD	Range
WHOQOL-OLD total score	84 ± 10	64–96
Sensory abilities	13 ± 4.1	5–19
Autonomy	13 ± 5.4	5–19
Past, present, and future activities	13 ± 1.9	11–16
Social participation	13 ± 3.9	4–18
Death and dying	16 ± 3.1	12–20
Intimacy	16 ± 3.0	12–20
MMSE-J score	21 ± 6.7	7–29

MMSE-J = Mini-Mental State Examination-Japanese version.

Associations Between WHOQOL-OLD Scores, Facially Expressed Affect, and MMSE-J

Pearson's and Spearman's correlation analyses identified several interpretable association patterns between WHOQOL-OLD scores and facially expressed affect during remote interviews (Tables 3 and 4). The most consistent pattern involved the past, present, and future activities domain. Higher scores in this domain were associated with greater facially expressed anger, contempt, and confusion, and lower valence in both Pearson's and Spearman's analyses. Disgust also showed a positive association with this domain in Pearson's analysis, and the Spearman coefficient was in the same positive direction. These associations are shown in Figure 1A–E.

Table 3. Relationships between WHOQOL-OLD Scores and Affdex-derived facial affect during remote interviews and MMSE-J scores by Pearson's correlation analysis.

Affect	Sensory abilities	Autonomy	Past, present, and future activities	Social participation	Death and dying	Intimacy	Total
Anger	0.093	0.316	0.835**	-0.702	0.407	0.082	0.417
Contempt	0.368	0.345	0.750*	0.169	0.126	-0.273	0.691
Disgust	0.302	0.351	0.877**	-0.691	0.214	-0.022	0.478
Fear	0.040	0.095	0.007	0.228	0.271	-0.451	0.086
Joy	0.589	0.514	-0.473	0.364	-0.602	0.081	0.219
Sadness	0.031	0.397	0.506	-0.129	0.601	-0.266	0.449
Surprise	0.129	-0.071	-0.150	0.076	0.178	-0.372	0.028
Sentimentality	0.216	0.340	0.575	-0.789*	0.228	0.112	0.467
Confusion	0.272	0.467	0.718*	-0.132	0.506	-0.464	0.593
Neutral	-0.227	-0.453	-0.642	0.255	-0.429	0.059	-0.608
Engagement	0.195	0.517	0.537	-0.191	0.055	0.420	0.770*
Valence	-0.060	-0.335	-0.845**	0.223	-0.619	0.184	-0.550
Attention	0.674	0.378	0.364	0.177	-0.079	-0.153	0.539
MMSE-J	-0.150	0.698	0.240	-0.337	-0.139	-0.269	0.106

WHOQOL-OLD was administered remotely via Zoom. For each domain, Affdex indices were averaged across the four corresponding item-response periods. Pearson's correlation coefficients (r) were calculated between each domain score, total WHOQOL-OLD score, and Affdex-derived indices, and Mini-Mental State Examination-Japanese version (MMSE-J) scores. Values are presented as correlation coefficients and two-sided p-values. *, nominal $p < 0.05$; **, nominal $p < 0.01$.

Table 4. Relationships between WHOQOL-OLD scores and Affdex-derived facial affect during remote interviews and MMSE-J scores by Spearman's rank correlation analysis.

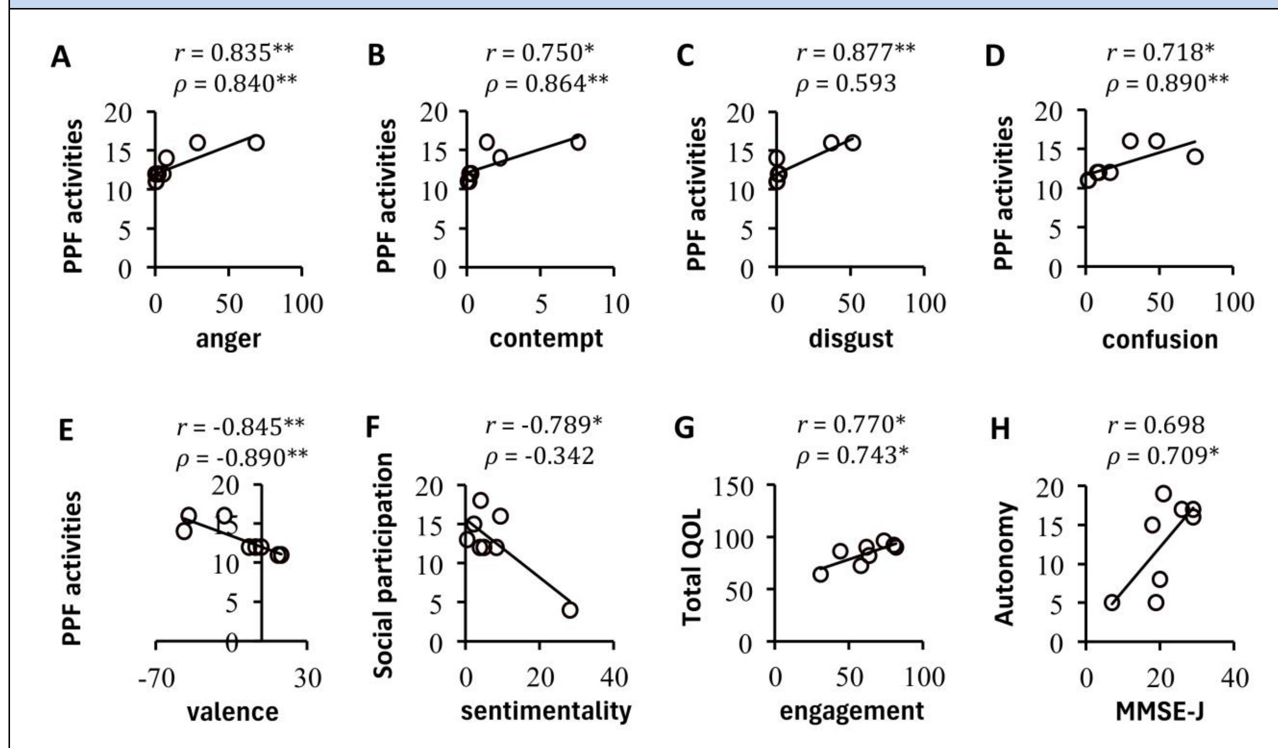
Affect	Sensory abilities	Autonomy	Past, present, and future activities	Social participation	Death and dying	Intimacy	Total
Anger	0.193	0.169	0.840**	0.049	0.415	0.036	0.611
Contempt	0.470	0.157	0.864**	0.366	0.171	-0.400	0.850**
Disgust	0.518	0.060	0.593	-0.439	-0.293	0.449	0.407
Fear	-0.145	0.072	0.087	0.195	0.415	-0.352	0.587
Joy	0.337	0.711*	-0.581	0.073	-0.220	-0.243	0.216
Sadness	0.048	0.169	0.482	-0.098	0.098	0.158	0.850**
Surprise	0.012	-0.024	-0.173	0.098	0.098	-0.121	0.252
Sentimentality	0.482	0.325	0.383	-0.342	0.024	0.097	0.707
Confusion	0.313	0.386	0.890**	0.268	0.317	-0.279	0.695
Neutral	-0.096	-0.241	-0.556	0.000	-0.342	-0.121	-0.755*
Engagement	0.072	0.277	0.432	-0.098	0.098	0.558	0.743*
Valence	-0.108	-0.072	-0.890**	-0.293	-0.512	0.012	-0.599
Attention	0.096	0.554	0.087	0.390	-0.171	-0.376	0.323
MMSE-J	-0.267	0.709*	0.124	-0.417	-0.086	-0.116	0.084

WHOQOL-OLD was administered remotely via Zoom. For each domain, Affdex indices were averaged across the four corresponding item-response periods. Spearman's rank correlation coefficients (ρ) were calculated between each domain score, total WHOQOL-OLD score, and Affdex-derived indices, and Mini-Mental State Examination-Japanese version (MMSE-J) scores. Values are presented as correlation coefficients and two-sided p-values. *, nominal $p < 0.05$; **, nominal $p < 0.01$.

The 95% confidence intervals for the main Pearson correlations shown in Figure 1 were wide, reflecting the very small sample size. For past, present and future activities, the Pearson coefficients and 95% confidence intervals were as follows: anger, r = 0.835, 95% CI = 0.317 to 0.969; contempt, r = 0.750, 95% CI = 0.096 to 0.952; disgust, r = 0.877, 95% CI = 0.451 to 0.978; confusion, r = 0.718, 95% CI = 0.027 to 0.945; and valence, r = -0.845, 95% CI = -0.971 to -0.347. The corresponding Pearson coefficients were r = -0.789, 95% CI = -0.960 to -0.190 for Social Participation and sentimentality; r = 0.770, 95% CI = 0.143 to 0.956 for total WHOQOL-OLD score and engagement; and r = 0.698, 95% CI = -0.013 to 0.940 for Autonomy and MMSE-J. These intervals indicate that the observed coefficients should be interpreted as preliminary estimates rather than precise or confirmatory effects.

Social participation showed an inverse association with sentimentality in Pearson's analysis, with the Spearman coefficient also showing the same negative direction, although with a smaller magnitude (Figure 1F).

Figure 1. Selected associations between WHOQOL-OLD scores, Affdex-derived facially expressed affect, and MMSE-J scores.



Panels A–E show associations between past, present, and future activities and facially expressed anger, contempt, disgust, confusion, and valence. Panel F shows the association between Social Participation and sentimentality. Panel G shows the association between the total WHOQOL-OLD score and engagement. Panel H shows the association between Autonomy and MMSE-J score. Pearson's correlation coefficients (r) and Spearman's rank correlation coefficients (ρ) are shown in each panel. *, nominal $p < 0.05$; **, nominal $p < 0.01$. PPF activities = Past, present, and future activities; MMSE-J = Japanese version of the Mini-Mental State Examination. Affdex emotion, engagement, attention, sentimentality, confusion, and neutral indices are shown in software-derived score units, with higher values indicating stronger algorithm-detected evidence of the corresponding facial expression or behavioral index. Valence is a bipolar index, with negative values indicating relatively negative facial affective valence, values near zero indicating neutral valence, and positive values indicating relatively positive facial affective valence.

Total WHOQOL-OLD score was positively associated with engagement in both Pearson's and Spearman's analyses, suggesting that higher overall QOL was accompanied by greater facially expressed behavioral involvement during the interview (Figure 1G). Autonomy showed a positive association with MMSE-J in Spearman's analysis, and the Pearson coefficient was also positive and of similar magnitude, although it did not reach nominal statistical significance (Figure 1H).

In Spearman's analysis, the total WHOQOL-OLD score was also positively associated with contempt and sadness and negatively associated with neutral expression, suggesting that higher total QOL may have been accompanied by a more differentiated and less affectively flat facial response pattern.

In contrast, the total WHOQOL-OLD score was not significantly associated with MMSE-J in either Pearson's analysis or Spearman's analysis. Overall, the main findings were characterized by domain-specific clustering of associations and, in several cases, consistency in direction and comparable magnitude across Pearson's and Spearman's analyses.

Discussion

This pilot study examined whether self-reported QOL during remote WHOQOL-OLD interviews was accompanied by identifiable patterns of facially expressed affect in very old adult day service users. The findings did not indicate a simple pattern in which higher QOL was associated only with smiling, joy, or uniformly positive facial valence. Instead, the observed associations were domain-specific. The most consistent pattern involved the past, present, and future activities domain, for which higher scores were associated with greater facially expressed anger, contempt, and confusion and lower valence in both Pearson's and Spearman's analyses, with disgust showing a similar positive association in Pearson's analysis. The total WHOQOL-OLD score was positively associated with engagement across both methods. Social participation was inversely associated with sentimentality in Pearson's analysis, with the Spearman coefficient showing the same negative direction. These findings suggest that remote QOL interviews may elicit observable facial response patterns that differ according to the content of the QOL domain being discussed.

The findings for past, present, and future activities domain are particularly important because this domain requires older adults to evaluate their life achievements, current activities, and future prospects. Such questions may activate emotionally complex self-reflection rather than simple pleasure or displeasure. In this context, facially expressed anger, contempt, disgust, confusion, and lower valence should not be interpreted literally as evidence that participants with higher scores were experiencing negative psychological states. A more cautious interpretation is that participants who reported greater satisfaction in this domain may have shown stronger affective activation while reflecting on personally meaningful experiences. For some very old adults, satisfaction with past and present life may include effortful appraisal, pride, tension, struggle, rivalry, regret overcome, or emotionally charged memories. The present findings, therefore, suggest that high QOL in this domain may be accompanied by a differentiated facial response pattern rather than by a calm or uniformly positive expression. This is clinically relevant because care providers may sometimes assume that better subjective well-being is expressed only through positive affect. The present results caution against that simplistic assumption.

The inverse association between Social Participation and sentimentality also deserves attention. In Affdex output, sentimentality should not be equated with general positive affect. Rather, it may reflect a particular type of facial response that can accompany nostalgic, tender, or past-oriented emotional expression. Participants with higher Social Participation scores may have been more oriented toward current roles, current relationships, and ongoing daily activities, and therefore may have shown less sentimental facial responding while answering social participation items. This interpretation is consistent with the broader geriatric care view that participation is not merely the presence of social contact, but the experience of being meaningfully involved in daily life. In adult day service settings, current participation, familiar relationships, and opportunities for activity may shape how older adults respond affectively when discussing their social life.

The association between total QOL and engagement may be the most immediately useful finding for geriatric care. Engagement is not a discrete emotion but an index of observable behavioral involvement during the interview. The positive association across both Pearson’s and Spearman’s analyses suggests that older adults with higher overall QOL may respond to remote QOL interviews with greater observable involvement. For clinicians and care staff, this finding has practical face validity. In everyday care, reduced engagement during conversation may raise concerns about fatigue, reduced motivation, cognitive difficulty, emotional withdrawal, or lack of perceived relevance. Conversely, greater engagement may suggest that the older adult is able and willing to participate meaningfully in the assessment process. Although engagement cannot replace self-report, it may provide useful contextual information when interpreting QOL responses.

Autonomy also showed potentially meaningful patterns. In Spearman's analysis, autonomy was positively associated with joy and with the MMSE-J score, and the corresponding Pearson coefficients were in the same direction. These findings should be interpreted cautiously because of the small sample size, but they are conceptually plausible. Perceived autonomy in very old adults may depend partly on cognitive capacity, communication ability, and the ability to express preferences. The association with joy may suggest that participants who perceived greater autonomy showed more positive facial responsiveness during the interview. However, the present study cannot determine whether better cognitive status supports perceived autonomy, whether autonomy enhances positive responsiveness, or whether both are influenced by broader functional and social factors.

Methodologically, the use of both Pearson’s and Spearman’s correlations was useful in this small pilot study. Pearson’s coefficients describe linear association, whereas Spearman’s coefficients describe rank-order monotonic association. The fact that several findings showed similar direction and magnitude across both methods suggests that the observed patterns were not simply artifacts of one analytic approach. At the same time, the analyses were exploratory, and nominal p-values should not be overinterpreted. The confidence intervals around the main Pearson correlations were wide, and this imprecision is important for interpretation. In a sample of eight participants, even large correlation coefficients can be unstable and may be influenced by individual observations. Therefore, the results should be interpreted as preliminary patterns that require replication, not as precise estimates of effect size or as evidence of predictive validity. The purpose of this study was to identify potentially meaningful patterns that can inform future research, not to establish definitive biomarkers of QOL.

The present findings also have implications for the future development of remote geriatric assessment. Older adults with cognitive decline may eventually become unable to provide reliable or sufficiently detailed answers to standard QOL questionnaires. In such cases, clinicians and care providers still need ways to understand subjective well-being, distress, participation, and emotional response to care. Automated facial expression analysis may eventually contribute to this task by providing supplementary observational information during structured interviews or routine care conversations. The present study should be regarded as an early methodological step in that direction. It does not show that QOL can be estimated from facial expression alone. Rather, it suggests that facial affect and engagement during QOL interviews may contain clinically interpretable information that is worth studying in larger samples.

Practical implications for geriatric care

For geriatric clinicians and adult day service providers, the main practical implication is that QOL assessment

may be enriched by observing how older adults respond, not only by recording what they answer. Facial engagement, hesitation, affective activation, and apparent response difficulty may help care providers identify domains that are personally salient or emotionally complex. In remote settings, where physical presence is limited, structured attention to observable facial responses may be especially helpful. Automated analysis could support this process by providing standardized supplementary indices, but it should be used cautiously and always interpreted alongside clinical context, participant communication, and self-report whenever available.

Limitations

Several limitations should be acknowledged. First, the sample size was very small, predominantly female, and drawn from a single adult day service context. The sample size was determined pragmatically for a pilot study, and no formal power calculation was performed. The results, therefore, cannot be generalized to all older adults, all day service users, or all cultural settings. Second, participants were limited to individuals who could provide consent, complete the Japanese WHOQOL-OLD, and participate in a Zoom-based interview. More frail older adults, persons with severe cognitive impairment, and persons with severe communication difficulties may therefore have been underrepresented. Third, the cross-sectional design prevents causal interpretation.

Fourth, many correlations were examined, and no formal multiplicity adjustment was applied. The significance markers should therefore be regarded as nominal. The findings are best interpreted as exploratory and hypothesis-generating, especially because the 95% confidence intervals were wide. Fifth, Affdex indices are algorithm-derived measures of facially expressed affect, not direct measures of inner emotional experience. The accuracy and interpretation of such indices in very old Japanese adults have not been fully established. Age-related changes in facial movement and appearance, camera angle, lighting, video quality, internet stability, interviewer interaction, fatigue, and cultural display rules may have influenced the results. Although staff support and exclusion of non-analysable video segments were used to reduce technical problems, these factors could not be eliminated.

Sixth, the present study did not compare Affdex outputs with independent human ratings, physiological measures, or repeated interviews. Future studies should use larger and more diverse samples, pre-specified primary hypotheses, procedures for multiplicity control, validation against human-coded facial behavior, and standardized video-recording conditions. Despite these limitations, the observed associations were not randomly distributed across all variables. They formed clinically interpretable patterns, particularly for past, present, and future activities, social participation, total QOL, and engagement.

Conclusion

This pilot study found that remote WHOQOL-OLD interviews elicited domain-specific facial affect and engagement patterns in very old adult day service users. Higher QOL was not simply accompanied by uniformly positive facial affect. Instead, past, present, and future activities domain was associated with complex facial affective activation, Social Participation was inversely associated with sentimentality, and total QOL was consistently associated with engagement. These findings support further investigation of automated facial expression analysis as a supplementary observational approach for geriatric QOL assessment in remote care settings.

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Author Contributions

Yoichi Yamane conceived the study and critically reviewed the manuscript. Takayoshi Ubuka conceived the experiments, developed the methods, conducted the experiments, analyzed the data, and drafted the manuscript. Kyohei Takada, Junko Yamaguchi, Keiko Kato, Fumihiko Komai, Takanobu Tezuka, Keiji Hashimoto, and Takeshi Hirose assisted with the experiments and reviewed the manuscript. All authors approved the final version of the manuscript.

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