THE BIG-5 PERSONALITY TRAITS AND PERSONAL CHARACTERISTICS AS PREDICTORS OF CANCER PATIENTS' QUALITY OF LIFE

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ABSTRACT

Background*: Personality traits and personal characteristics may predispose patients to emotional and behavioral tendencies that can affect how they cope with the challenges of ill health and hence their quality of life (QoL). The aim of this study is to examine the big-5 personality traits and personal characteristics as predictors of cancer patients' QoL.* ***Methods****: This is a descriptive quantitative cross-sectional survey research that used convenience sampling technique to recruit 144 cancer patients from the Radiation Oncology Department of the University College Hospital, Ibadan. A demographic form, an abridged Quality of Life in Adult Cancer Survivors (QLACS) scale and the Big Five Inventory–2 Extra-Short Form (BFI-2-XS) were used for data collection. Data was analyzed using descriptive, correlation and hierarchical regression analysis.* ***Results****: Significant relationship was found between cancer patients' QoL with conscientiousness (r= -.238, p<0.01), extroversion (r= -.265, p<0.01) and neuroticism (r=.558, p<0.01). Furthermore, on hierarchical regression analysis personal characteristics in the first model had no significant joint influence on the prediction of QoL (R^2 = .082; $F_{(7,103)}$ = 1.314 p> .05). When the big-5 personality traits were introduced along with personal characteristics in the second model, the model's joint influence on the prediction of QoL improved (R^2 = .416; $F_{(12,98)}$ = 5.815 p< .01) accounting for 41.6% of the variance in QoL of cancer patients. With regards to the relative contribution however, in the Model 1, only marital status had a significant relative influence on the prediction of cancer patients QoL (β = .215, t = -2.043, P<0.05). In Model 2, only conscientiousness (β = -.203, t = -2.259, P<0.05), extroversion (β = -.170, t = -2.037, P<0.05) and neuroticism (β = .509, t =6.217, P<0.01) made significant relative contributions to the prediction of cancer patients QoL.* ***Conclusions:*** *Personality traits influence cancer patients' quality of life and should be considered in all assessments geared at accurately understanding and improving patients' QoL in oncology settings.*

Keywords*: Personality traits, Cancer, Quality of life, Nigeria*

INTRODUCTION

Improving patients' quality of life (QoL) is an important area of concern in social medicine and psychology. QoL describes people's perceptions of their life circumstances as compared to the ideals and culture of where they reside in comparison to their own aspirations, opportunities, principles and concerns (WHO, 2012). It is a multidimensional concept encompassing people's physical, cognitive and psychosocial functioning as well as the subjective perception of an individual's state which can influence the general psychosocial well-being (Scotté et al., 2018). Cancer as a disease has a high potential to negatively impact patients' QoL. It constitutes a foremost health challenge in Africa with a projected 752,000 new cancer cases diagnosed annually and an expected annual increase of 70% between 2012 and 2030 (Willemijn et al., 2020; Mutebi et al., 2020; Jemal, Torre & Soerjomataram, 2019).

The focus of cancer treatment is not merely about the prevention of death and treatment complications. Rather, it also encompasses patient-reported outcomes like QoL that are currently being considered as essential targets in cancer patients' management and recognized as primary endpoints by regulatory agencies (Lang-Rollin & Berberich, 2018). Empirical findings have reported poor QoL in cancer patients (Ramasubbu et al.. 2021; Ochoa et al., 2019; Catherine et al., 2019).

Though it could be assumed that a severe diagnosis such as cancer would negatively influence a patient's QoL, this may not always be so as QoL is a subjective experience that might not be solely determined by physical health status but may also be affected by other variables like personality traits, demographic characteristics, attitudes and cognitive processes. A key feature of the human adaptation process to life exigencies is personality. It affects and is greatly affected by the events in a person's life (Wagner et al., 2019). Personality is an enduring, pervasive and relatively stable pattern of motivation, feelings, attitudes and behaviors. Regarding cancer, the reactions to the diagnosis and likelihood of adapting to the alteration in functioning associated with the diagnosis involve the patients' integrations of emotions and beliefs about their diagnosis along with their idiosyncratic ways of coping. The Big-Five Personality Model comprising conscientiousness, agreeableness, neuroticism, openness and extraversion (CANOE) dimensions is one of the theoretical psychological frameworks used to explore different personality traits (McCrae & Costa, 2008). Personality traits are linked to our core motivational system which determines what we are driven to achieve in the absence of a significant environmental interference and hence constitute an important variable to be explored in relation to QoL (Fetvadjiev & He, 2019). Prior researches have shown a close link between personality traits and diseases and how they can predict health outcomes (Stanisz et al., 2020; Rassart et al., 2020; Schneider-Matyka et al., 2019, Lai et al., 2019). These however, need to be further explored as personality characteristics in clinical settings play a key role in determining patients' capacity to adapt to their health challenges and to practice behaviors geared towards improving survival and QoL.

Literature on the influence of socio-demographic factors on cancer patients' QoL has been inconsistent. Higher educational qualifications is associated with and strongly predict better QoL among patients with various types of cancers (Bhattacharjee, & Ghosh, 2023; Kung'u, Onsongo & Ogutu, 2022; Soita, 2022). This may be because patients with higher educational status have a better appreciation of contemporary issues around them along with what needs to be done for a better outcome, which could help improve their overall QoL (Javed, & Khan, 2016). However, some other studies found that cancer patients with postsecondary education had lower QoL compared with those with secondary education or less (Shen et al., 2012; Chow et al., 2020). Also, the influence of socioeconomic status which is often closely tied to educational qualifications has been found to have varying influence on cancer patients QoL with some researchers reporting no significant influence (Surbhi, Brar & Lalota, 2022) while other studies reported otherwise (Munasinghe & Rathnayaka, 2016; Roick et al., 2019; Jacob et al., 2019).

Age showed a statistically significant relationship with QoL in 108 adult cancer survivors (Kung'u, Onsongo & Ogutu, 2022). Older age was associated with worse physical

functioning domain of QoL (Chow et al., 2020; Nuhu, Adebayo, & Adejumo, 2013; Mian, 2021). But being young was associated with a better social domain QoL and a significant predictor of a better QoL in another study (Onyeka et al., 2021). However, age did not show significant relationship with QoL amongst cancer patients in another study (Takada et al., 2020). Gender differences in QoL have also been reported with overall QoL score being lower for male cancer patients than female cancer patients (Nuhu, Adebayo, & Adejumo, 2013; Islam et al., 2023). But, the association between QoL and gender was not significant amongst patients receiving palliative and adjuvant chemotherapy (Dhatchayani et al., 2022). Also, statistically significant relationship has been reported between QoL marital status, religious affiliation and the religion one belonged to (Kung'u et al., 2022). Patients who were single had worse QoL compared to the married participants (Kung'u et al., 2022; Bunevičiuset al., 2012). However another study found marital status did not have any influence on the QoL (Han et al., 2014). Social support from family, friends, medical staff and other communal support systems also have direct and indirect influence on cancer patients' QoL, via reducing depression, anxiety and stigmatization and increasing access to instrumental, informational and emotional resources (Ellis et al., 2020; Zhang et al., 2019). Furthermore, regression analysis showed that age, educational level, and religious affiliation are significant predictors of QoL in cancer survivors (Kung'u et al., 2022).

Some studies have examined QoL in different cancers and documented varying levels of QoL based on types of cancer (Koboto et al., 2020; Kyei et al., 2020). Among patients with different types of cancer no significant association was found between the different cancer types and the patients overall QoL, thus implying that patients with different cancer types were similar in their overall quality of life (Onyeka et al., 2021). A large population-based research of cancer survivors however, reported worse physical capabilities, reduced self-reported health as well as poorer QoL amongst survivors compared to people who are cancer free, with significant difference across different cancer types (Joshy et al., 2020; Mian, 2021; Drageset et al., 2021). The probable explanation for poorer QoL outcomes for certain cancers is lesser cure rate, higher symptom burden, severer treatment side effects and more prevalence of co-morbidity (Joshy et al., 2020) .

The purpose of this study is to explore the influence of the big-5 personality traits and personal characteristics on the prediction of cancer patients QoL.

Research Questions

Research question 1: What is the common pattern of personality traits seen amongst cancer patients?

Research question 2: What type of relationship exists between the big-5 personality traits and cancer patients' quality of life?

Research question 3: How do the big-5 personality traits and personal characteristics influence the prediction of cancer patients QoL, jointly and individually?

METHOD

Research design

This study utilized a descriptive quantitative cross-sectional research design adopting expost facto method.

Sampling technique:

The non-probability procedure of sampling in which those who participated in the study were selected based on their availability rather than through random selection was used to recruit consenting cancer patients who visited the Radiation Oncology Department, University College Hospital (UCH) for treatment. Only cancer patients who were 18years or older and receiving treatment on outpatient basis were eligible to participate in the study.

The average of 65 cancer patients treated monthly at Radiation Oncology Department of the UCH, Ibadan constituted the population for this study (Akinwande, et al., 2023). This gives an estimated population of 230 cancer patients that will be treated over a three and a half months period allotted for data collection and a suitable sample size of 144 was obtained using Krejcie and Morgan table (Krejcie and Morgan, 1970).

Study instruments:

QoL was assessed with an abridged version of the 47-item QoL in Adult Cancer Survivors (QLACS) scale (Avis et al., 2005). A composite QoL score used in this study is derived by adding up the response to every item on the scale. The scores of all positive statements were reversed such that lower scores (or more response of "never") correspond to better QoL (Avis et al., 2005). A 5-point response format of Never (0), A few times (1), Sometimes (2), Often (3) and Always (4) was used on the scale (Fathollahi-Dehkordi et al., 2021). To lessen patients' burden of responding to lengthy items while also ensuring that only very statistically relevant items were used to assess QoL, only items that loaded at .700 and higher on factor analysis were selected for administration. Hence, for this study, 24 items of the original 47 items of the QLACS scale were used for assessing QoL. The total possible score on the adapted QLACS scale ranges from 0 to 96. Elevated scores on the scale correspond to poorer QoL. A typical item on the QLACS scale is: *'You worried about cancer coming back'*.

The Big Five Inventory–2 Extra-Short Form (BFI-2- XS) (Soto, & O. P. John, 2017) was used to assess personality traits. Some items on the scale are reverse-keyed and denoted by "R". The 15-item scale is made up of 5 subscales with 3 items each. Responses were appraised via the 4-point scale of 1 Disagree Strongly, 2 Disagree, 3 Agree and 4 Agree Strongly. Possible subscales score ranges from 3 to 12. Elevated scores on the subscales connote greater expression of specific personality traits. Typical items on each subscale are: I am someone who …: *'is fascinated by art, music, or literature'* (Openness); *'tends to be disorganized'* (Conscientiousness); *'tends to be quiet'* (Extraversion); *'is sometimes rude to others'* (Agreeableness); and *'tends to feel depressed, blue'* (Neuroticism).

The subscales of the QLACS have yielded adequate reliability scores above 0.70 in previous studies (Sohl, Levine, & Avis, 2015; Avis, Edward & Foley, 2006). The authors of the BFI-2-XS reported a test-retest reliability range of .60 to .80 in university sample and .71 to .80 in the college sample for the 15-item scale (Soto, & O. P. John, 2017).

A pilot study was conducted using 20 cancer patients receiving treatment in a private cancer facility prior to data collection to ascertain the suitability of the measures for this setting. The adapted 24-item QLACS scale used in this study yielded an acceptable reliability score of .881. Also, the five BFI-2-XS subscales used in this study yielded acceptable reliability score of .511 for Openness, .529 for Conscientiousness, .745 for Extroversion, .776 for Agreeableness and .698 for Neuroticism.

Procedure for data collection

Ethical approval was obtained from the UI/UCH/IRB to undertake the study. A trained research assistant with a master's degree was engaged to collect data from the respondents. Data was collected on clinic days when patients receive radiation treatments and chemotherapy. Patients were approached in the clinic reception area by the research assistant who explained the nature of the study, assured them of confidentiality and anonymity of the information gathered and enquire about their willingness to take part in the research. Those who expressed their willingness to take part were given the informed consent form to review and sign, while those who were unable to read were read to. Respondents who freely agreed to partake in the research were given the questionnaire to fill while waiting to be seen by their consultants. The filled questionnaires were collected immediately after completion.

Data Analysis

Data was analyzed on IBM-SPSS version 21 using frequency, percentages, mean and standard deviation as applicable for socio-demographic and medical characteristics. Correlation analysis was used to establish the relationship between personality traits and QoL. Hierarchical regression analysis was used to assess the joint and relative contributions of personality traits (CANOE) and personal characteristics on the prediction of cancer patients' QoL. Decisions on all statistical analyses were determined using a significance level of $p \leq 0.05$ (95% CI).

RESULTS

Table 1: Personal characteristics of study participants

Table 4.1: Respondents' Characteristics (N = 144)

Variables	Frequency	Percentage
Age of respondents (years)		
18 – 39	26	18.0%
40 – 60	74	51.4%
61 – 89	44	30.6%
Mean ± SD	**52.64 ± 15.20**	
Gender		
Male	39	27.1%
Female	105	72.9%
Religion		
Christianity	101	70.1%
Islam	38	26.4%
Others	5	3.5%
Employment status		
Unemployed	51	35.4%
Employed	69	47.9%
Retired	5	3.5%
Not indicated	19	13.2%
Marital status		
Married	85	59.0%
Not currently married	31	21.5%
Never married	28	19.5%
Educational level		
Nil Formal Education	18	12.4%
Primary	25	17.4%
Secondary	41	28.5%
Tertiary	60	41.7%
Cancer type		
Breast cancer	48	33.3%
Cervical cancer	21	14.6%
Prostate cancer	13	9.0%
Others	62	43.1%

Source: Fieldwork, 2023

Table 1 shows that a little over half of the patients were in the 40 to 60 years age group (51.5%). Females constituted 72.9% of the respondents, 70.1% were Christians, 47.9% were employed, 59% were married and 41.7% had tertiary level of education. Patients with breast cancer were more (33.3%) compared to other cancer types.

Research question 1: What is the pattern of personality traits seen amongst cancer patients?

Table 2: Pattern of personality traits seen in cancer patients

Big-5 Personality Traits	Low/moderate (scores of 1-8)		High (scores of 9-12)	
	Frequency	Percent	Frequency	Percent
Openness	42	29.2%	102	70.8%
Conscientiousness	38	26.4%	106	73.6%
Extroversion	61	42.4%	83	57.6%
Agreeableness	17	11.8%	127	88.2%
Neuroticism	106	73.6%	38	26.4%

Table 2 shows that majority of the study participants had high agreeableness trait (88.2%) followed by conscientiousness (73.6%) and openness (70.8%) while most had low neuroticism trait (73.6%).

Research question 2: What type of relationship exists between the big-5 personality traits and cancer patients' quality of life?

Table 3: Summary of correlation analysis showing relationship amongst the personality traits and cancer patients' quality of life

		1	2	3	4	5	6
Quality of life (1)	r	1	-.131	-.238**	-.265**	-.116	.588**
Openness (2)	r		1	.182*	.246**	.132	-.236**
Conscientiousness (3)	r			1	.051	.466**	-.141
Extraversion (4)	r				1	.063	-.198*
Agreeableness (5)	r					1	-.198*
Neuroticism (6)	r						1
	N	144	144	144	144	144	144
	Mean	36.01	9.14	9.88	8.85	10.41	6.57
	SD	15.597	1.642	1.848	1.981	1.635	2.421

Table 3 shows that there was significant relationship between cancer patients' quality of life with conscientiousness (r= -.238, p<0.01), extroversion (r= -.265, p<0.01) and neuroticism (r=.588, p<0.01). As lower scores indicate better quality of life, the inverse relationship between conscientiousness and extroversion with QoL implies that the higher the conscientiousness and extroversion, the lower the score on QoL, and hence the better the quality of life. The linear relationship between neuroticism and quality of life means that the higher the neuroticism, the higher the score on QoL which implies a worse QoL. However, openness (r = -.131, p>0.05) and agreeableness (r = -.116, p>0.05) did not have significant relationship with cancer patients QoL.

Research question 3: How do the Big-5 personality traits and personal characteristics influence the prediction of cancer patients QoL, jointly and independently?

Table 4: Hierarchical regression analysis showing the big-5 personality traits and personal characteristics as predictors of quality of life in cancer patients

Variables	Model 1			Model 2		
	Beta	T	Sig	Beta	T	Sig
Age	-.081	-.730	.467	-.023	-.252	.802
Gender	-.056	-.508	.612	-.043	-.478	.634
Religion	-.067	-.643	.522	-.057	-.658	.512
Employment status	-.033	-.328	.743	-.019	.232	.817
Education	.085	.820	.414	.065	.757	.451
Marital status	**.215**	**2.043**	**.044**	.160	1.811	.073
Cancer type	-.075	-.683	.496	-.140	-1.505	.136
Openness				.057	.666	.507
Conscientiousness				**-.203**	**-2.259**	**.026**
Extroversion				**-.170**	**-2.037**	**.044**
Agreeableness				-.067	-.735	.464
Neuroticism				**.509**	**6.217**	**.000**
Model Summary Model 1: R = .286 R^2 = .082 Adj R^2 = .020 SEE = 15.105 $F_{(7,103)}$ = 1.314 p> .05 Model 2: R = .645 R^2 = .416 Adj R^2 = .344 SEE = 12.353 $F_{(12,98)}$ = 5.815 p< .01						

Dependent Variable: Quality of Life

Table 4 shows the hierarchical regression analysis with personal characteristics in model 1 and personal characteristics with the big-5 personality traits in Model 2. Personal characteristics in the first model had no significant joint influence on the prediction of QoL (R^2 = .082; $F_{(7,103)}$ = 1.314 p> .05) though it explains 8.2% of the variation in QoL. When the big-5 personality traits were introduced along with personal characteristics in the second model, the model's joint influence on the prediction of QoL improved (R^2 = .416; $F_{(12,98)}$ = 5.815 p< .01) accounting for 41.6% of the variance in QoL of cancer patients. With regards to the relative contribution however, in the Model 1, only marital status had a significant relative influence on the prediction of cancer patients QoL (β = .215, t = -2.043, P<0.05) but this was lost in Model 2, (β = .160, t = 1.811, P>0.05). In Model 2, conscientiousness (β = -.203, t = -2.259, P<0.05), extroversion (β = -.170, t = -2.037, P<0.05) and neuroticism (β = .509, t =6.217, P<0.01) made significant relative contributions to the prediction of cancer patients QoL. Thus high conscientiousness and extroversion with low neuroticism predicted better QoL

DISCUSSION

This study investigated personality traits (conscientiousness, agreeableness, neuroticism, openness and extraversion) and personal characteristics as predictors of cancer patients' QoL. The most common personality traits found amongst cancer patients was agreeableness reported by 88.2% of the study participants followed by conscientiousness (73.6%), openness (70.8%) and extraversion (57.6%) while the least personality trait reported amongst the respondents was neuroticism trait (26.4%). Agreeableness, conscientiousness and openness are traits associated with therapeutic compliance and multiple self-care behaviors (Christensen and Smith, 1995; Lima, Machado & Irigaray, 2018; Skinner, Hampson and Fife-Schaw, 2002) that can impact treatment outcomes including QoL. High agreeableness signifies the tendency to cooperate with healthcare providers, high degree of openness is characterized by the ability to be willing to experience and tackle new situations while high conscientiousness is depicted by the ability to take necessary

health actions. The cancer patients in this study can be typically described as highly agreeable, conscientious and open-minded. This finding is comparable to the highly reconcilable/agreeable and responsible/conscientious personality traits indicated in an earlier study among cancer patients in Turkey (Turhal et al., 2013). The cancer patients in the study from Turkey were however less open compared to the respondents in this study, which may be attributed to cultural differences in the processing and disclosure of illness related emotions (Turhal et al., 2013). An examination of the median scores on cancer patients' personality traits in another study showed that scores were highest for conscientiousness followed by openness, extraversion, agreeableness and the least was neuroticism (Pichler et al., 2022). The participants in the German study were relatively less agreeable and more extraverted than those in the current study.

Better quality of life in cancer patients was found to be significantly related to higher conscientiousness and extroversion with lower neuroticism. The meta-analysis of Anglim et al.(2020) showed associations of neuroticism, extraversion, and conscientiousness with psychological and subjective well-being which are indicators of QoL. The correlation between higher conscientiousness and extroversion with better QoL in patients with different cancer types including breast, lung and ovarian cancer patients has been reported in literature (Wintraecken et al., 2022; Oyeleke & Jason, 2019; de Mol et al., 2020; Kim et al., 2018; Mobaraki et al., 2019). The influence of extraversion on better QoL is most likely attributable to the high level of optimism among those with high extraversion trait, their ability to effortlessly form relationships with greater likelihood of accessing social support. Cancer patients high on conscientiousness tend to adhere with treatment plans and seek health-related information that enable them take positive health actions in terms of self-care behaviors which can help improve their QoL (Takei et al., 2021) and hence explains the relationship found between conscientiousness and better QoL. Patients that are high on neuroticism are likely to experience worse QoL due to their predisposition to expressing symptoms of depression and anxiety as well as their tendency to emotionally respond negatively to stressful situations (Banjongrewadee et al., 2020). While no significant relationship emerged between openness and QoL in this study, openness had a linear association with overall QoL in non-metastatic breast cancer patients (Wintraecken et al., 2022).

Though personal characteristics in the first model did not have a significant joint influence on the prediction of cancer patients QoL in this study, marital status had a significant relative influence on the prediction of cancer patients QoL in the first model. Other studies have reported on the significant independent contribution of marital status on the prediction of cancer patients QoL (Kung'u et al., 2022; Bunevičiuset al., 2012). Patients who were single had worse QoL compared to the married participants (Kung'u et al., 2022; Bunevičiuset al., 2012). However another study found marital status did not have any influence on the QoL (Han et al., 2014). Unlike the findings of the current study, other studies showed that age, educational level, and religion were significant predictors of QoL in cancer survivors (Kung'u et al., 2022).

Personality traits in this study had significant joint influence on the prediction of cancer patients QoL similar to the findings of other researchers (Wintraecken et al., 2022; Oyeleke & Jason, 2019). In agreement with extant literature we found that conscientiousness and extraversion predicted better QoL (Stanisz et al., 2020; Maalouf, Hallit, & Obeid, 2022; Amini, Shiasy, Motallebi, & Lotfi, 2020) while neuroticism predicted poorer QoL (Lai et al., 2019; Harandi, Mohammadali, & Khayyer, 2020). The negative effect of high levels of neuroticism towards physical and psychological health has been documented (Widiger and Oltmanns, 2017). Investigations involving cancer survivors and those approaching the end of their lives reported that high neuroticism was a significant independent predictor of worse QoL (Ghiggia et al., 2021; Dědová et al., 2022; Stanisz et al., 2020). Our finding however differs from that reported amongst

women with breast cancer in Ibadan where neuroticism failed to show significant relative influence on the prediction of QoL (Oyeleke & Jason, 2019). In other studies, high trait conscientiousness also significantly predicted better QoL among breast, lung and ovarian cancer patients (Wintraecken et al., 2022; Oyeleke & Jason, 2019; de Mol et al., 2020; Kim et al., 2018). This could possibly be attributed to the tendency for patients with high conscientiousness to perceive themselves as being capable of managing their cancer- or illness-related difficulties and their inclination to participate actively in treatment (Bovero et al., 2020). Extraversion represents the tendency to experience positive emotions, to be sociable, dominant and assertive and has been shown in this and other studies to predict better overall QoL in cancer patients (Wintraecken et al., 2022; Oyeleke & Jason, 2019; Mobaraki et al., 2019).

This study's finding that openness did not predict cancer patients' QoL is similar to that reported amongst breast cancer patients in Ibadan (Oyeleke & Jason, 2019) but differs from that of a study amongst women with breast cancer-related genetic mutations where openness was found to significantly predict QoL (Stanisz et al., 2020). However, agreeableness was found to significantly predict QoL amongst breast cancer patients in another study contrary to that reported in the current study (Oyeleke & Jason, 2019).

Limitations

This study has a number of limitations that should be considered when interpreting the results. First, cognizance was not given to the specific clinical characteristics of the patients in analysis which may also predict cancer patients' QoL. Future studies should take into account more clinical predictors of QoL such as cancer stage, type of treatment, duration of illness and co-morbid illnesses. Also, the cross-sectional nature of the study did not allow for the assessment of variation in QoL vis-a-viz personality traits across the cancer care continuum.

Conclusion

Quality of life is a subjective perception of functioning in different aspects of a person's life and it's a strong measure of cancer patients' treatment outcomes. Personality traits such as conscientiousness, extroversion and neuroticism as well as personal characteristics such as marital status significantly influence cancer patients' QoL and should be considered in all assessments geared at accurately understanding and improving patients' QoL in oncology settings.

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