

Health literacy and therapeutic adherence of patients undergoing oral antineoplastic chemotherapy: a correlational study

Letramento em saúde e adesão terapêutica de pacientes em quimioterapia antineoplásica via oral: estudo correlacional

Alfabetización en salud y adherencia terapéutica de pacientes en quimioterapia antineoplásica oral: estudio correlacional

Yasmin Araujo Braz^a 

Maria Meimei Brevidelli^b 

Edvane Birelo Lopes De Domenico^a 

How to cite this article:

Braz YA, Brevidelli MM, De Domenico EBL. Health literacy and therapeutic adherence of patients undergoing oral antineoplastic chemotherapy: a correlational study. Rev Gaúcha Enferm. 2025;46(spe1):e20250018. <https://doi.org/10.1590/1983-1447.2025.20250018.en>

ABSTRACT

Objective: to correlate the levels of health literacy, therapeutic adherence, and sociodemographic and clinical characteristics of adults with cancer undergoing oral antineoplastic therapy.

Method: this is a cross-sectional, correlational study conducted in the oncology outpatient clinics of a philanthropic general hospital in São Paulo. Instruments used included a sample characterization form, Treatment Adherence Measure and the Brazilian version of the European Health Literacy Survey. Data were analyzed using descriptive and analytical statistics.

Results: the sample consisted of 100 patients: 68% were 51 years of age or older; 52% without comorbidities and were taking three or more medications daily; 53% had 11 years of education or more; and 49% were retired or pensioners. Inadequate literacy was found in 52.9%, problematic in 24.1%, sufficient in 20.7% and excellent in 2.3%. The mean adherence was 5.6 (SD= 0.7), and among those with non-adherence, 58% did not comply with the administration schedule. A statistically significant positive relationship was found between health literacy and education level, and a negative relationship between health literacy and the frequency of medication administration.

Conclusion: health literacy was characterized as inadequate or problematic. The score related to adherence to oral chemotherapy was high. Low general health literacy did not influence adherence to the oral antineoplastic therapeutic regimen.

Descriptors: Health Literacy; Medication Adherence; Antineoplastic; Neoplasm; Patient-Reported Outcome Measures.

RESUMO

Objetivo: correlacionar os níveis de letramento em saúde, adesão terapêutica e características sociodemográficas e clínicas de adultos com câncer em terapia antineoplásica via oral.

Método: estudo transversal, correlacional, realizado nos ambulatórios de oncologia de um hospital geral filantrópico em São Paulo. Instrumentos utilizados foram formulário de caracterização da amostra, Medida de Adesão de Tratamento e a versão brasileira do *European Health Literacy Survey*. Os dados foram analisados com estatística descritiva e analítica.

Resultados: amostra de 100 pacientes: 68% possuíam 51 anos ou mais; 52% não tinham comorbidades em uso diário de três medicamentos ou mais; 53% tinham 11 anos de estudo ou mais; e 49% estavam aposentados ou eram pensionistas. Verificou-se letramento inadequado em 52,9%, problemático, em 24,1%, suficiente, em 20,7%, e excelente, em 2,3%. A média de adesão foi 5,6 (DP=0,7), e, na não adesão, 58% não cumpriam o horário de administração. Houve relação estatisticamente positiva entre letramento em saúde e escolaridade, e negativa entre letramento em saúde e a frequência da administração dos medicamentos.

Conclusão: o letramento em saúde foi caracterizado como inadequado ou problemático. O escore relacionado à adesão à quimioterapia oral foi alto. O baixo letramento em saúde geral não influenciou a adesão ao esquema terapêutico antineoplásico oral.

Descritores: Letramento em Saúde; Adesão à Medicação; Antineoplásicos; Neoplasias; Medidas de Resultados Relatados Pelos Pacientes.

^a Universidade Federal de São Paulo (Unifesp), Escola Paulista de Enfermagem, São Paulo, São Paulo, Brasil.

^b Universidade Paulista (Unip), Instituto de Ciências da Saúde, São Paulo, São Paulo, Brasil.

RESUMEN

Objetivo: correlacionar los niveles de alfabetización en salud, adherencia terapéutica y características sociodemográficas y clínicas de adultos con cáncer en terapia anticancerosa oral.

Método: estudio correlacional y transversal, realizado en los ambulatorios de oncología de un hospital general filantrópico de São Paulo. Instrumentos utilizados fueron formulario de caracterización de muestra, Medida de Adherencia al Tratamiento y versión brasileña de la *European Health Literacy Survey*. Los datos fueron analizados mediante estadística descriptiva y analítica.

Resultados: muestra de 100 pacientes: 68% tenían 51 años o más; 52% no presentaban comorbilidades y utilizaba tres o más medicamentos diariamente; 53% tenían 11 años o más de educación; y el 49% eran jubilados o pensionados. Se encontró alfabetización inadecuada en el 52,9%, problemática en el 24,1%, suficiente en el 20,7% y excelente en el 2,3%. La adherencia media fue de 5,6 (DE=0,7), y, en caso de incumplimiento, 58% no cumplió con el esquema de administración. Se encontró una relación estadísticamente positiva entre alfabetización en salud y escolaridad, y una relación negativa entre alfabetización en salud y frecuencia de administración de medicamentos.

Conclusión: la alfabetización en salud se caracterizó como inadecuada o problemática. La puntuación relacionada con la adherencia a la quimioterapia oral fue alta. No hubo diferencia estadísticamente significativa entre la alfabetización en salud general y la adherencia al régimen de terapia antineoplásica oral.

Descriptores: Alfabetización en Salud; Cumplimiento de la Medicación; Antineoplásicos; Neoplasias; Medición de Resultados Informados por el Paciente.

■ INTRODUCTION

As established in the Ottawa Charter during the First International Conference on Health Promotion in 1986, the process of community empowerment to improve their quality of life and well-being, including greater participation of people in controlling the processes of illness, is a necessary condition for progress in the healthcare field⁽¹⁾.

Promoting health literacy (HL) in the real world is a major challenge for citizens, organizations, institutions and healthcare professionals. In the dynamic process of health and disease, there is decision-making that is fundamental and influenced by the person's level of HL, mainly in observing health-promoting behaviors.

From the perspective of chronic diseases, low HL can impact the non-adoption of protective behaviors, the difficulty in early perception of signs and symptoms, low capacity to adapt to lifestyle changes that benefit the fight against and control of the disease, among other consequences^(2,3).

Cancer is currently among the main chronic non-communicable diseases, and its treatment involves several isolated or combined therapeutic modalities that require patient learning for self-management. Building self-management skills involves: identifying, monitoring, and managing biological and psychosocial signs and symptoms; managing the illness journey, aligning clinical consultations, treatment regimens,

and reconciling with social roles; building relationships with healthcare professionals; acquiring knowledge and skills to participate in therapeutic decisions, and maintaining a personal plan for survival^(4,5).

In therapeutic terms, there have been advances in the field of antineoplastic chemotherapy (CT) with a new arsenal of oral medications for various cancer diagnoses. The use of oral antineoplastic chemotherapy (OCT) administration grants the person greater autonomy, but also greater responsibility. OCT can cause less negative impact on lifestyle and daily life, since it does not require hospitalizations or outpatient regimens, which alter the usual routine. The greatest disadvantage of this therapeutic modality, certainly feared by healthcare professionals, is non-adherence to treatment, which can harm the intended therapeutic response, and can lead to drug resistance mechanisms in malignant neoplastic cells, thus worsening the patient's prognosis^(6,7).

According to the World Health Organization definition, adherence expresses the level of agreement between what the patient does, and the guidance provided by healthcare professionals regarding medications, diet therapy and/or lifestyle changes⁽⁸⁾. Non-adherence may be intentional, when related to the patient knowledge and beliefs about the medication that leads them to voluntarily interrupt or modify the treatment. Non-adherence may also be unintentional, due to cognitive deficiencies, impaired memory or external factors, such as the lack of medication⁽⁷⁾.

The present study was designed based on the concern about the negative influence of low HL on the levels of adherence to OCT, as indicated by specialized literature that considers HL as an important indicator of the person's ability and autonomy to understand, adhere to and, in the short, medium and long term, manage the proposed therapy^(4,9). Therefore, the central question guiding the development of the present study was: Do HL levels interfere with adherence to oral chemotherapy?

The objective of the study was to correlate HL levels, therapeutic adherence and sociodemographic and clinical characteristics of adults with cancer undergoing oral antineoplastic therapy.

■ METHOD

A cross-sectional, correlational study conducted in the oncology outpatient clinics of a large general hospital institution and a teaching hospital of a federal university, both located in the city of São Paulo, SP, Brazil. The general teaching hospital is registered with the Ministry of High Complexity Oncology Care Center. The study design was based on the items of the STrengthening the Reporting of OBservational studies in Epidemiology checklist for better detailing the constitutive stages of the research⁽¹⁰⁾.

The sample was convenience-based and, for the sample calculation, a 95% confidence level, an acceptable difference of 9% and an inadequate HL level of 65.9% were considered, this result derived from a previous study⁽¹¹⁾ that assessed the health literacy of people with type 2 diabetes assisted by the Unified Health System (*Sistema Único de Saúde - SUS*), forming a sample of 107 participants.

The eligibility criteria were to be over 18 years old and currently undergoing OCT treatment initiated no less than 30 days. Those who had their therapy interrupted by a medical decision and who had auto- and allopsychic disorders attested in their medical records, which prevented them from answering the questionnaires, were excluded.

Patients were contacted during their outpatient medical consultation after a prescription for oral chemotherapy was confirmed in their electronic medical records or from specialized oncology pharmacy. All patients who met the inclusion criteria were invited

to participate, and an interview was scheduled at the location where the interview was conducted or by telephone, in the most comfortable conditions for the participant. Care was taken to ensure that the participant had full autonomy to answer the questions without any interference from the researchers, unless assistance was requested to understand the text. The approximate application time was 30 minutes.

Data were collected in three specialty outpatient clinics at the institution that hosted the study, one for mastology and two for oncohematology, as these are specialties that include OCT in their therapeutic protocols and that maintain multiprofessional teams linked to medical and multiprofessional residency programs in oncology, as well as undergraduate and graduate students from a university extension program entitled "*Acolhe-Onco: interdisciplinarity in comprehensive care for cancer patients*", registered at the university institution hosting the study.

The assistance for people with cancer and their families at the institution is organized with the integration of residency programs and the operational precepts of the university extension program. *Acolhe-Onco* considers that education processes in health are enhanced by the quality of human relationships and by the combination of different teaching resources, such as verbal guidance supported by written material, in the form of agendas and leaflets, and the development of information and communication technologies. Interprofessionality and comprehensive care are present in both in-person and remote activities (*Nursing Telephone Counseling (Aconselhamento Telefônico de Enfermagem - ATEnf) Acolhe-Onco*), and aimed to build patient skills for self-management, favoring their active participation in the illness process, minimizing risks and promoting treatment⁽¹²⁾.

Data collection took place from 2019 to 2021, being interrupted in 2020, between March and December, due to the COVID-19 pandemic, which generated restrictions on in-person data collection imposed as safety measures by educational and research institutions. Research data can be obtained upon request and evaluation by the authors.

The sociodemographic and clinical characterization of the sample consisted of questions in a structured form containing variables on age, sex, oncological medical diagnosis, staging (pathological), time since diagnosis,

preexisting comorbidities, number of oral medications taken daily, years of schooling, and work activity prior to the cancer diagnosis and current (occupation and hours worked per day).

In addition to the sociodemographic and clinical form, two instruments were applied: the Brazilian version of the European Health Literacy Scale (HLS-EU-BR)⁽¹³⁾; and the Measure Treatment Adherence (MTA)⁽¹⁴⁾.

The HLS-EU-BR⁽¹³⁾ consists of 47 questions related to the four dimensions of information processing, such as access, understanding, evaluation and use of health-related information for decision-making. Each question is answered on a Likert scale with the options "very difficult" (1), "difficult" (2), "easy" (3) and "very easy" (4), with a fifth alternative corresponding to "don't know/no answer" (5). The indicators are standardized in a single metric, which goes from zero to 50, in which zero represents the lowest HL level, and 50, the highest. The final score indicates the following HL levels: inadequate (zero to 25); problematic (>25-33); sufficient (>33-42); and excellent (>42-50). Authorization to use this instrument was obtained from the main author.

The MTA⁽¹⁴⁾ consists of seven items that assess the individual's adherence to prescribed medication therapy, which is widely used in chronic diseases^(15,16). For each item of the instrument, there are alternatives on a Likert scale: always (1); almost always (2); frequently (3); sometimes (4); rarely (5); never (6). The final adherence score is obtained by summing the values in each item and dividing by the number of items. Final scores between one and three indicate lower adherence, while between four and six indicate higher adherence. Authorization to use this scale was not necessary, as it is in the public domain and no changes were made to the original version.

Data were entered into and stored in a Microsoft Excel database. The information was processed using the Statistical Package for the Social Sciences software, version 28.0 (IBM Corp., Armonk, New York, United States). A 5% significance level was adopted for statistical tests. Descriptive statistics were used to present the sample characterization variables and the HL and therapeutic adherence level scores. To compare different groups of races/ethnicities in relation to the HLS-EU-BR scores,

univariate analysis of variance (ANOVA) was used as an independent factor for variables that did not violate the assumption of data normality, and the Kruskal-Wallis H test was used for those that violated the same principle. In comparisons using ANOVA, when a violation of the homoscedasticity assumption was observed ($p \leq 0.05$, Levene's test), Welch's correction was applied for heteroscedasticity in the calculation of the p-value.

Correlation analysis between health literacy levels and sociodemographic variables (age, education level, and number of children) and clinical variables (number of medications and frequency of use) was performed using Spearman's correlation test.

Comparisons of HL levels between groups with or without comorbidities were conducted using Student's t-test, using the bias-corrected and accelerated bootstrap sampling method, based on 1,000 samples. No violation of the homoscedasticity assumption ($p > 0.05$, Levene's test) was observed for all comparisons. The effect size of the difference between the three groups was measured using Cohen's coefficient, based on the following criteria: small, if between 0.200 and 0.499; medium, if between 0.500 and 0.799; and large, if above 0.800.

To analyze the correlation between health literacy and therapeutic adherence, Pearson's correlation test was used. The correlation coefficients, 95% Confidence Intervals, and p-values were calculated using the bootstrap sampling method, bias-corrected and accelerated, based on 1,000 samples.

The internal consistency of the MTA and HLS-EU-BR instruments was obtained by calculating Cronbach's alpha coefficient and McDonald's omega coefficient. The proposal by Nunnally and Bernstein was used to interpret the two coefficients, in which, for applied research, a value of 0.7 is considered the minimum acceptable for both⁽¹⁷⁾.

The study followed ethical recommendations for obtaining approval by the Research Ethics Committee of the institution where the study was conducted, under Opinion No. 1,352/2018. All participants agreed and signed the Informed Consent Form prior to data collection.

■ RESULTS

The sample consisted of 100 participants. The sociodemographic data of the sample (Table 1) revealed that 41% of the participants self-identified as brown or black, and 68% were 51 years old or older. The education level of the participants was heterogeneous; however, when grouping the first four categories, it was found that the majority (55%) had not completed high school. Regarding the participants' occupation, 49% were retired or pensioners; 31% were unemployed or working in informal jobs; and 15% had formal employment.

Regarding clinical variables, 52% had no comorbidities and reported taking three or more medications during the day, and 74% reported taking them between once and twice a day. Regarding cancer diagnoses, there were similar proportions of participants with breast cancer (46%) and chronic myeloid leukemia (45%), while 9% of patients had a diagnosis of multiple myeloma. Similar proportions were also reported in relation to oral chemotherapy, as 46% reported using endocrine therapy, while 45% reported using tyrosine kinase inhibitors.

Regarding strict medication use, the overall mean was 5.6 ($SD=0.7$), which indicates consistent therapeutic adherence. It was observed that more than 90% of participants reported never having stopped taking their medications because they felt better or worse (questions 3 and 4). On the other hand, 78% of participants reported neglecting the schedule at frequencies ranging from always to rarely. The levels of therapeutic adherence according to the questions in the MTA instrument are found in Table 2.

It is important to highlight that 36% of participants stopped treatment, at some point, as they did not check the expiration date of the pills and the need for replacement (question 6).

The data obtained from the HL assessment tool (HLS-EU-BR) generated an average overall HL score (HLS-Overall) of 27.7 ($SD=6.6$), which classified it as problematic. The mean scores in the other dimensions ranged from 25.2 to 29.4, evidencing a problematic level of literacy regarding healthcare, disease prevention and health promotion. Table 3 shows the data distributed according to the dimensions of the HLS-EU-BR and the resulting scores.

Table 1. Sociodemographic and clinical data of participants in clinical oncology outpatient clinics. São Paulo, SP, Brazil, 2019 -2021 (n=100)

Variable/category	n	%
Race/ethnicity		
White	39	39
Brown	29	29
Black	12	12
Non-respondents	20	20
Occupation		
Retired/pensioner	49	49
Unemployed/informal	31	31
Employed	15	15
Non-respondents	5	5

Table 1. Cont.

Variable/category	n	%
Frequency		
1	37	37
2	37	37
3	20	20
4	6	6
Education level		
Illiterate	2	2
Incomplete elementary school	26	26
Complete elementary school	14	14
Incomplete high school	13	13
Complete high school	26	26
Higher education	14	14
Non-respondents	55	55
Illiterate	2	2
Age		
18 – 30 years	7	7
31 – 50 years	23	23
51 – 64 years	36	36
65 or older	32	32
Non-respondents	2	2
Number of medications		
0 – 2	48	48
3 – 4	27	27
5 or more		

Table 1. Cont.

Variable/category	n	%
Type of oral chemotherapy		
Endocrine therapy	46	46
Immunomodulators	9	9
Tyrosine kinase inhibitor	45	45
Medical diagnosis		
Breast cancer	46	46
Multiple myeloma	9	9
Chronic myeloid leukemia	45	45
Comorbidities		
Yes	48	48
No	52	52

Source: prepared by author.

Table 2. Mean scores and frequencies of therapeutic adherence to oral chemotherapy among participants according to the Measure Treatment Adherence instrument in clinical oncology outpatient clinics. São Paulo, SP, Brazil, 2019-2021 (n=100).

	Always		Almost always		Frequently		Sometimes		Rarely		Never		Mean	SD
	n	%	n	%	n	%	n	%	n	%	n	%		
Q1	0	0.0	1	1.0	2	2.0	13	13.0	33	33.0	51	51.0	5.3	0.85
Q2	1	1.0	5	5.0	4	4.0	16	16.0	32	32.0	42	42.0	5.0	1.17
Q3	0	0.0	1	1.0	1	1.0	1	1.0	4	4.0	93	93.0	5.9	0.56
Q4	0	0.0	1	1.0	0	0.0	4	4.0	9	9.0	86	86.0	5.8	0.61
Q5	0	0.0	1	1.0	0	0.0	7	7.0	1	1.0	91	91.0	5.8	0.65
Q6	0	0.0	1	1.0	0	0.0	10	10.0	25	25.0	63	63.0	5.5	0.76
Q7	0	0.0	1	1.0	0	0.0	3	3.0	14	14.0	81	81.0	5.8	0.61
Overall		5.6		0.7										

Legend: SD - Standard Deviation. Q1 - Have you ever forgotten to take your medication for your illness? Q2 - Have you ever been careless about the time to take your medications for your illness? Q3 - Have you ever stopped taking medication for your illness because you felt better? Q4 - Have you ever stopped taking medication for your illness because you felt worse? Q5 - Have you ever taken one or more pills on your own after feeling worse? Q6 - Have you ever stopped taking medication for your illness because you ran out of medication? Q7 - Have you ever stopped taking medication for any reason other than medical advice?

The presence or absence of comorbidities was related to HL levels. The mean scores in the domains of the literacy scale among participants with comorbidity ranged from 24.3 (SD=7.6) to 29.0 (SD=6.4), while among those without comorbidities, they ranged from 26.1 (SD=9.0) to 29.6 (SD=8.1). However, the differences between participants with or without comorbidities were not statistically significant. Except for the health promotion domain among participants with comorbidities, which was classified as inadequate, all values characterize problematic literacy. The highest HL level in the HLS-DP was observed among participants without comorbidity (29.6; SD of 8.1; $\phi=30.0$) and a lower level in the same domain among those with comorbidities (24.3; SD of 7.6; 22.6). The highest median was obtained in the HLS-HC among those without comorbidities ($\phi=30.2$). However, the differences between the two groups of participants were not statistically significant.

When analyzing the possible correlations between health literacy levels and sociodemographic and clinical variables (Table 4), a positive correlation was identified between education and overall literacy ($p=0.007$), and between education and the HLS-HC ($p=0.021$) and HLS-DP ($p=0.010$) dimensions. The findings revealed that participants with higher educational levels

demonstrated higher overall HL and better literacy related to healthcare and disease prevention.

On the other hand, there was a negative correlation between the frequency of medication administration and the levels of HL-Overall ($p=0.024$), HLS-DP ($p=0.011$) and HLS-HP ($p=0.034$). The findings showed that participants with lower levels of general literacy, literacy for disease prevention (HSL-DP) and health promotion (HLS-HP) used medications more frequently throughout the day.

There was a statistically significant positive correlation between literacy in the HLS-DP domain and therapeutic adherence ($p=0.04$), indicating that participants with more consistent therapeutic adherence demonstrated higher levels of literacy in this domain (Table 5).

Cronbach's alpha and McDonald's omega coefficients were calculated to assess the internal consistency of the MTA and HLS-EU-BR. The MTA presented values above 0.70, while the HLS-EU-BR obtained values above 0.80 in the different dimensions, being 0.85 and 0.83 in the HLS-HC for Cronbach's alpha and McDonald's omega, respectively, and 0.84 and 0.83 in the HLS-DP dimension and 0.88 in both coefficients in the HLS-HP dimension. For HLS-Overall, the values were 0.94 and 0.93, respectively.

Table 3. Health literacy scores of participants according to the dimensions of the Brazilian version of the European Health Literacy Scale in clinical oncology outpatient clinics. São Paulo, SP, Brazil, 2019-2021 (n=100)

Variable	n	Mean	SD	Median	Min.	Max.
HLS-Healthcare	97	28.4	7.0	27.8	6.3	46.9
HLS-Disease prevention	92	29.4	7.2	28.9	4.4	45.6
HLS-Health promotion	87	25.2	8.3	24.0	11.5	50.0
HLS-Overall	4	27.7	6.6	26.6	9.2	45.1

Legend: SD - Standard deviation; Min - Minimum; Max - Maximum; HLS - Health Literacy Scale.

Table 4. Correlation analysis of the Brazilian version of the European Health Literacy Scale scores with age, number of medications, frequency of daily administration, education level, and number of children. São Paulo, SP, Brazil, 2019-2021 (n=100).

Variable		Age	Number of Medications	Frequency of administration	Education level	Number of children
HLS-HC	Coef.	0.004 [-0.209, 0.235]	-0.073 [-0.262, 0.133]	-0.077 [-0.274, 0.130]	0.244 [0.011, 0.451]	-0.077 [-0.272, 0.133]
	p	0.967	0.499	0.471	0.021*	0.472
HLS-DP	Coef.	-0.028 [-0.250, 0.190]	-0.130 [-0.339, 0.078]	-0.277 [-0.499, -0.065]	0.280 [0.057, 0.494]	-0.063 [-0.279, 0.165]
	p	0.800	0.239	0.011*	0.010*	0.566
HLS-HP	Coef.	0.052 [-0.171, 0.286]	-0.099 [-0.322, 0.149]	-0.239 [-0.436, -0.007]	0.219 [-0.007, 0.436]	-0.063 [-0.292, 0.176]
	p	0.652	0.384	0.034*	0.052	0.580
HLS-Overall	Coef.	0.029 [-0.173, 0.233]	-0.104 [-0.311, 0.132]	-0.244 [-0.437, -0.013]	0.287 [0.084, 0.465]	-0.100 [-0.307, 0.130]
	p	0.794	0.342	0.024*	0.007*	0.360*

Spearman's correlation test.

Legend: CI - Confidence Interval; Coef. - Coefficient; *statistically significant value at the 5% level ($p \leq 0.05$).**Table 5.** Correlation analysis between the Brazilian version of the European Health Literacy Scale and the Measure Treatment Adherence scores. São Paulo, SP, Brazil, 2019-2021 (n=100).

Variable		HLS-HC	HLS-DP	HLS-HP	HLS-Overall
MTA	Coef.	0.013 [-0.157, 0.229]	0.215 [0.001, 0.388]	0.128 [-0.058, 0.285]	0.128 [-0.024, 0.270]
	p	0.901	0.040*	0.239	0.221

Pearson's correlation test.

Legend: MTA - Measure Treatment Adherence; Coef. - Coefficient; *statistically significant value at the 5% level ($p \leq 0.05$); HLS - Health Literacy Scale; HC - Health care; DP - Disease prevention; HP - Health promotion.

DISCUSSION

The dataset revealed adherence to antineoplastic treatment by the participants, however, literacy levels were assessed as inadequate or problematic.

To better analyze the data, which seem controversial, some analytical possibilities were considered, such as the context of care provided to these patients. The respondents were assisted in the outpatient clinics of a university hospital that has interprofessionality as one of its main characteristics, highlighting the strategic and planned support, coming from the *Acolhe-Onco* extension program and the medical and multiprofessional oncology residency programs, which include nurses, pharmacists, physical therapists, social workers, dentists, nutritionists and psychologists^(12,18).

Thus, it was considered that the quality of care resulting from the person-centered care model may have played an important role in the adherence outcomes obtained, regardless of the patients' HL level⁽¹⁹⁾. Caring for a person with cancer as a chronic disease, whether undergoing treatment, cured or with the disease under control, means incorporating into the sphere of care all the particularities of daily life, such as family, work and leisure, in addition to all the fundamental requirements of prevention and health promotion, in its biopsychosocial aspects⁽²⁰⁾.

The MTA had an overall score above 5 in the present investigation, with a score of 6 indicating full adherence. Although there is no gold standard for adherence in the literature, adherence rates above 80% are generally considered acceptable, and are directly associated with better treatment outcomes⁽²¹⁾.

All respondents in this study were continuously receiving oral medications for cancer treatment. In the case of CT, the determination of the medication, dose, route of administration and frequency of use is made by controlled and randomized clinical trials that predict the success rate in coping with different cancer diagnoses, as well as establishing the patient safety⁽²²⁾.

Regarding the discussion of breast cancer patients undergoing endocrine therapy, low adherence may be associated with lower survival rates, as found in a systematic review in which data show a risk of up to two times greater of death or recurrence⁽²³⁾.

For patients undergoing treatment for chronic myeloid leukemia, suboptimal adherence to tyrosine kinase inhibitors, the main drug administered for this diagnosis, is a widely recognized problem that compromises disease control and patient survival⁽²⁴⁾.

A study that evaluated adherence, persistence and effectiveness over two years, defined as disease-free, event-free and treatment-free survival with two drugs from the tyrosine kinase inhibitor class (dasatinib and nilotinib), found that adherence to treatment was 91% and 82%, respectively for each medication. Two-year persistence was 77%, while disease-free survival reached 92% for participants on both medications⁽²⁵⁾. The findings lead to the understanding that the concern with therapeutic adherence of individuals undergoing continuous treatment cannot be neglected over time.

Given that adherence goes beyond the dichotomy between taking or not taking medication, expanding the concept to compliance with all professional recommendations on how medication should be administered, the devaluation of time of medication intake is a relevant fact that increases the chances of forgetting, as well as the risk of interaction with food and/or other medications⁽²⁶⁾.

The scientific literature highlights some variables for patients to stop taking medication, such as: not knowing how to correctly manage signs and symptoms; lack of self-management skills; lack of information about treatment; beliefs, needs and expectations regarding medications; lack of social and family support; and low quality of the relationship with healthcare professionals⁽²⁷⁾. However, in this study, most patients reported never having stopped taking medication for any reason.

The first statistically significant association between HL and sociodemographic characteristics was related to the participants' education level, considered a determinant for achieving better HL levels⁽²⁸⁾.

Literacy plays a facilitating role in the development of HL, since it will demand different skills from the person and will constantly challenge them in the health and disease process. The use of years of schooling as a relevant factor is based on the premise that the longer someone remains in school, the greater the set of skills they will have to master writing and numbers, as well as their implications in social practices⁽²⁸⁾.

It is worth noting that, despite the established relationship between education and literacy, when used the necessary tools, it is possible to guide all individuals toward better HL levels⁽²⁹⁾. For individuals living with cancer, treatments are invariably long or even indefinite, therefore suggesting greater caution when measuring the level of understanding of the person regarding the guidance received, since the high level of morbidity and mortality of cancer leave no room for doubts⁽³⁰⁾.

From the perspective of professional-patient communication, patients may feel uncomfortable or fearful of not knowing how to reproduce the guidance, not having actually understood the information, or even not being able to change their behavior due to social, economic or cultural issues. Thus, the use of simple language and effective communication, without technical terms and that are culturally close to the person and their social reality, can be established as strategies that foster a dialogical relationship⁽²⁹⁾. The satisfactory adherence findings of this study probably reside in the joint action of professionals to meet the demands of person-centered care, allowing for the reinforcement of guidance and remote monitoring of patients between outpatient consultations.

Thus, a negative correlation was found between daily frequency of medication administration, HL levels and adherence, among patients who take a high number of medications. These findings corroborated the risk of low adherence being related to polypharmacy and complex administration medication regimens, such as scheduling, dose calculation, alternating doses throughout the day, among others⁽²⁵⁾.

The data from this investigation pointed out that the domain with the best performance was health promotion, with a lower rate of inadequate HL and a higher percentage of patients with sufficient HL. Although most patients had inadequate or problematic literacy levels, there was no direct relationship between these and adherence levels, except for the positive correlation between higher adherence and a higher level of literacy for disease prevention. Thus, a counterpoint could be observed between two axes that are usually directly proportional: therapeutic adherence and HL.

In this study, it was assumed that the results found are related to the care model used by the healthcare team, as well as to the tools developed and used in the care process, namely: information leaflets prepared by the

extension group; forms for recording medication intake, with date, time and usage instructions; welcoming and active screening of cases that seem problematic in outpatient consultations for management and identification of treatment-related toxicities; and easy access to the team, in case of doubts, through telephone counseling, available every day of the week⁽¹²⁾.

Regarding the reliability of the instruments used, the internal consistency of the MTA, measured by Cronbach's alpha in the present study and in previous studies, ranged from 0.60 to 0.85, but was considered appropriate across all values within the range due to the small number of items in the instrument⁽¹⁴⁾. The HLS-EU-BR was applied in a recent national study in people with diabetes in public outpatient care, and the Cronbach's alpha coefficient was higher than 0.80⁽³¹⁾.

The set of data from the present investigation brings challenges for professionals involved in caring for people, as well as a warning for all professionals who work with similar populations, since the data showed very low HL levels, and this condition may have repercussions on other dimensions of the journey of becoming ill with cancer. Moreover, it also showed that adherence to drug therapy, in this case to antineoplastic chemotherapy, can be achieved, even with unfavorable HL conditions.

The limitations of the study relate to data collection, mainly regarding the number of participants, which did not reach the minimum expected, since data collection was interrupted by the COVID-19 pandemic and influenced by the instability of social isolation period, especially for respondents who began to be monitored via telehealth. Another limitation is in the selection of respondents, as included three cancer diagnoses, whereas ideally, would be to select a single diagnosis so that the natural history of the disease, the particularities of pharmacological treatments and the signs and symptoms would also be considered in the analysis of therapeutic adherence.

The main contribution of the study to nursing practice lies in the importance of planning health care and health education for people with cancer undergoing OCT, considering the possible reality of low HL levels. Another valuable contribution is the non-linearity of low HL resulting in non-adherence to therapy, reinforcing the essential roles that health education and effective person-centered communication have in achieving quality care.

■ CONCLUSION

In this study, conducted with adult patients, users of a public healthcare service undergoing oral antineoplastic treatment, HL levels were not associated with therapeutic adherence.

The mean HL levels corresponded to the “inadequate” and “problematic” scores in all domains (health care, disease prevention and health promotion). However, adherence to OCT received a higher adherence score, though there was a tendency toward neglecting to take the medication at the correct times.

In the correlations between literacy levels and sociodemographic and clinical variables, it was found that the higher the education level, the higher the general literacy in the dimensions of health care and disease prevention. Respondents with lower levels of overall HL and in the dimensions of disease prevention and health promotion showed a higher frequency of medication intake.

■ REFERENCES

1. Buss PM, Hartz ZMA, Pinto LF, Rocha CMF. Health promotion and quality of life: a historical perspective of the last two 40 years (1980–2020). *Cien Saude Colet*. 2020;25(12):4723–35. <https://doi.org/10.1590/1413-812320202512.15902020>
2. Pavão AL, Werneck GL. Health literacy in low- and middle-income countries: a systematic review. *Cien Saude Colet*. 2021;26(9):4101–14. <https://doi.org/10.1590/141381232021269.05782020>
3. Nutbeam D, Lloyd JE. Compreender e responder à alfabetização em saúde como um determinante social da saúde. *Annu Rev Public Health*. 2021;42:159–73. <https://doi.org/10.1146/annurev-publhealth-090419-102529>
4. Noorlandt H, Stoevelaar R, van Dongen S, Arslan M, Luu N, Kranenburg L, *et al*. Challenges in self-management of persons living with advanced cancer: An exploratory, in-depth interview study. *Eur J Cancer Care (Engl)*. 2022;31(6):e13638. <https://doi.org/10.1111/ecc.13638>
5. Li M, Ni P, Zuo T, Liu Y, Zhu B. Cancer literacy differences of basic knowledge, prevention, early detection, treatment and recovery: a cross-sectional study of urban and rural residents in Northeast China. *Front Public Health*. 2024;12:1367947. <https://doi.org/10.3389/fpubh.2024.1367947>
6. Greer JA, Jacobs JM, Pensak N, Nisotel LE, Fishbein JN, MacDonald JJ, *et al*. Randomized trial of a smartphone mobile app to improve symptoms and adherence to oral therapy for cancer. *J Natl Compr Canc Netw [Internet]*. 2020[cited 2023 Jan 18];18(2):133–41. Available from: <https://pubmed.ncbi.nlm.nih.gov/32023526/>
7. Skrabal Ross X, Gunn KM, Suppiah V. A review of factors influencing non-adherence to oral antineoplastic drugs. *Support Care Cancer*. 2020;28:4043–50. <https://doi.org/10.1007/s00520-020-05469-y>
8. World Health Organization (WHO). Adherence to long-term therapies: evidence for action [Internet]. Geneva: WHO; 2003[cited 2023 Jan 18]. Available from: <https://apps.who.int/iris/handle/10665/42682>
9. Keating NL, Brooks GA, Landrum MB, Liu PH, Wolf R, Riedel LE, *et al*. The oncology care model and adherence to oral cancer drugs: a difference-in-differences analysis. *J Natl Cancer Inst*. 2022;114(6):871–7. <https://doi.org/10.1093/jnci/djac026>
10. Malta M, Cardoso LO, Bastos FI, Magnanini MMF, Silva CMFP. STROBE initiative: guidelines on reporting observational studies. *Rev Saude Publica*. 2010;44(3):559–65. <https://doi.org/10.1590/S0034-89102010000300021>
11. Sampaio HAC, Carioca AAF, Sabry MOD, Santos PM, Coelho MAM, Passamai MPB. Letramento em saúde de diabéticos tipo 2: fatores associados e controle glicêmico. *Ciênc Saúde Colet*. 2015; 20:865–74. <https://doi.org/10.1590/1413-81232015203.12392014>
12. Louzada KRS, Brevidei MM, Baiocchi O, Domenico EBLD. Aconselhamento telefônico: identificação de sintomas em pacientes com linfoma em quimioterapia antineoplásica. *Acta Paul Enferm*. 2018;31(6):616–26. <https://doi.org/10.1590/1982-0194201800085>
13. Pavão ALB, Werneck GL, Saboga-Nunes L, Sousa RA. Avaliação da literacia para a saúde de pacientes portadores de diabetes acompanhados em um ambulatório público. *Cad Saude Publica*. 2021;37(10):e00084819. <https://doi.org/10.1590/0102-311X00084819>
14. Delgado AB, Lima ML. Contributo para a validação concorrente de uma medida de adesão aos tratamentos. *Psicol Saúde Doenças*. 2001;2(2):81–100. <http://hdl.handle.net/10400.12/1114>
15. Boas LCGV, Lima MLSAP, Pace AE. Adherence to treatment for diabetes mellitus: validation of instruments for oral antidiabetics and insulin. *Rev Latino-Am Enfermagem*. 2014;22(1):11–8. <https://doi.org/10.1590/0104-1169.3155.2386>
16. Borba LO, Capistrano FC, Ferreira ACZ, Kalinke LP, Mantovani MF, Maftum MA. Adaptation and validation of the Measuring of Treatment Adherence for mental health. *Rev Bras Enferm*. 2018;71:2243–50. <https://doi.org/10.1590/0034-7167-2017-0796>
17. Nunnally JC, Bernstein IH. Psychometric theory. 3rd ed. New York: McGraw-Hill; 1994.
18. Araújo BL, Teraoka EC, Teixeira TOA, Coutinho GMM, Almeida MS, Domenico EBL. Cuidado de enfermagem e paliativo de um jovem com rabinomiossarcoma. *Rev Enferm UFPE*. 2021;15:e246441. <https://doi.org/10.5205/1981-8963.2021.246441>
19. González-Bueno J, Sevilla-Sánchez D, Puigoriol-Juveny E, Molist-Brunet N, Codina-Jané C, Espauella-Panicot J. Improving medication adherence and effective prescribing through a patient-centered prescription model in patients with multimorbidity. *Eur J Clin Pharmacol*. 2022;78(1):127–37. <https://doi.org/10.1007/s00228-021-03207-9>

20. Okuma GY, Manhães MF, Pedras RN, De Domenico EB, Bergerot CD. Espiritualidade, religiosidade, distress e qualidade de vida em pacientes oncológicos. *Psicol Saúde*. 2021;13(2):3–17. <https://doi.org/10.20435/pssa.v13i2.1097>
21. Schnorrerova P, Matalova P, Wawruch M. Medication adherence: measurement methods and approaches. *Bratisl Med J*. 2024;125(4):264–73. https://doi.org/10.4149/bll_2024_40
22. Davis TC, Arnold CL, Mills G, Lesser GJ, Brown WM, Schultz R, *et al*. Assessment of oral chemotherapy nonadherence in chronic myeloid leukemia patients using brief measures in community cancer clinics: a pilot study. *Int J Environ Res Public Health*. 2021;18(21):11045. <https://doi.org/10.3390/ijerph182111045>
23. Eliassen FM, Blåfjelldal V, Helland T, Arnold CL, Mills G, Lesser GJ, Brown WM, *et al*. Importance of endocrine treatment adherence and persistence in breast cancer survivorship: a systematic review. *BMC Cancer*. 2023;23:625. <https://doi.org/10.1186/s12885-023-11122-8>
24. Ciaffaglione V, Consoli V, Intagliata S, Marrazzo A, Romeo G, Pittalà V, *et al*. Novel tyrosine kinase inhibitors to target chronic myeloid leukemia. *Molecules*. 2022;27(10):3220. <https://doi.org/10.3390/molecules27103220>
25. Santoleri F, Ranucci E, La Barba G, Colasanto I, Scaldaferri M, Cattel F, *et al*. Adherence, persistence and efficacy of dasatinib and nilotinib in the treatment of patients resistant or intolerant to imatinib with chronic myeloid leukemia in chronic phase: an Italian multicenter study over two years in real life. *Curr Med Res Opin*. 2021;37(3):477–81. <https://doi.org/10.1080/03007995.2021.1876006>
26. Schindler F, Schinkoethe T, Mahner S, Kolben T, Wuerstlein R, Culmsee C, *et al*. Clinical relevance of potential self-medication drug interactions in antineoplastic and immune-modulating therapy among online pharmacy customers. *Ther Adv Drug Saf*. 2023;14. <https://doi.org/10.1177/20420986231188845>
27. Talens A, Guilabert M, Lumbreras B, Aznar MT, López-Pintor E. Medication experience and adherence to oral chemotherapy: a qualitative study of patients' and health professionals' perspectives. *Int J Environ Res Public Health*. 2021;18(8):4266. <https://doi.org/10.3390/ijerph18084266>
28. Zanolini P, Lorini C, Lastrucci V, Minardi V, Possenti V, Masocco M, *et al*. Health literacy, socio-economic determinants, and healthy behaviours: results from a large representative sample of Tuscany Region, Italy. *Int J Environ Res Public Health*. 2021;18(23):12432. <https://doi.org/10.3390/ijerph182312432>
29. Wang EY, Borno HT, Washington III SL, Friedlander T, Zhang S, Trejo E, *et al*. Engaging men of diverse racial and ethnic groups with advanced prostate cancer in the design of an mHealth diet and exercise intervention: focus group study. *JMIR Cancer*. 2023;9:e45432. <https://doi.org/10.2196/45432>
30. Al Hussein Al Awamlh B, Moses KA, Whitman J, Stewart T, Kripalani S, Idrees K. Health literacy and all-cause mortality among cancer patients. *Cancer*. 2025;131(6):e35794. <https://doi.org/10.1002/cnccr.35794>
31. Nunes L, Bittlingmayer UH, Harsch S, Vincenzi SL, Silva SA, Konrath AC, *et al*. Propriedades psicométricas do instrumento de letramento em saúde no Brasil (HLS-EU-BR47). *BMC Public Health*. 2024;24:1655. <https://doi.org/10.1186/s12889-024-19108-2>

■ **Data and material availability**

Access to the dataset can be obtained upon request to the corresponding author.

■ **Authorship contribution**

Conceptualization: Yasmin Araujo Braz, Maria Meimei Brevideili, Edvane Birelo Lopes De Domenico
Data curation: Yasmin Araujo Braz, Maria Meimei Brevideili, Edvane Birelo Lopes De Domenico
Investigation: Yasmin Araujo Braz
Methodology: Yasmin Araujo Braz, Maria Meimei Brevideili, Edvane Birelo Lopes De Domenico
Project administration: Yasmin Araujo Braz
Resources: Yasmin Araujo Braz
Validation: Maria Meimei Brevideili, Edvane Birelo Lopes De Domenico
Writing-original draft: Yasmin Araujo Braz
Writing-review & editing: Yasmin Araujo Braz, Maria Meimei Brevideili, Edvane Birelo Lopes De Domenico

The authors declare that there is no conflict of interest.

■ **Corresponding author:**

Yasmin Araujo Braz
E-mail: yaasminbraz@gmail.com.

Associate editor:

Carlise Rigon Dalla Nora

Editor-in-chief:

João Lucas Campos de Oliveira

Received: 01.28.2025

Approved: 05.21.2025