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Revista de Educação a Distância
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EmRede, v.11. 2024

Profile and Determining Factors in Completing a Self-Instructional Distance Education Course in TMO

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Abstract: This study analyzes the profile of students and the association of individual characteristics with the completion rate and success in a self-instructional distance education course on bone marrow transplantation offered by the Unified Health System (SUS - also known as the Brazilian public health care system). This is a retrospective cohort study of participants of both sexes, over 18 years of age, enrolled in the self-instructional distance education course in 2023. The independent variables included demographic characteristics, employment status, and professional aspects associated with the outcomes of completion and success in the course. Of the 969 participants enrolled, 60.2%

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

completed the course, with completion more likely among those who passed the public examination (71%). Physicians, professionals with more experience in the field, and those who completed the course within 60 days performed better. Statistical analysis highlighted factors such as employment status and time devoted to bone marrow transplantation (TMO) as determinants of success.
Keywords: Distance education in health; Course completion; Predictors of academic success.

Perfil e Fatores Determinantes na Conclusão de Curso EaD Autoinstrucional em TMO

Resumo: A pesquisa analisa o perfil dos cursistas e a associação das características individuais à taxa de conclusão e ao sucesso em um curso EaD autoinstrucional sobre transplante de medula óssea do Sistema Único de Saúde (SUS). Trata-se de uma coorte retrospectiva com participantes de ambos os sexos, maiores de 18 anos, inscritos no curso EaD autoinstrucional em 2023. As variáveis independentes incluíram características demográficas, vínculo empregatício e aspectos profissionais associadas aos desfechos da conclusão e do sucesso no curso. Dos 969 inscritos, 60,2% concluíram o curso, sendo a conclusão mais provável entre concursados (71%). Médicos, profissionais com maior experiência na área e aqueles que concluíram o curso em até 60 dias apresentaram melhor desempenho. A análise estatística destacou fatores como vínculo empregatício e tempo de dedicação ao Transplante de Medula Óssea (TMO) como determinantes de sucesso.
Palavras-chave: EaD em saúde; Conclusão de curso; Fatores preditores de sucesso acadêmico.

Perfil y factores determinantes en la realización de un curso autodidáctico a distancia en TMO

Resumen: El estudio analiza el perfil de los participantes en el curso y la relación entre las características individuales y la tasa de finalización y el éxito en un curso autoinstructivo a distancia sobre trasplante de médula ósea en el Sistema Único de Salud (SUS). Se trata de una cohorte retrospectiva con participantes de ambos sexos, mayores de 18 años, inscritos en el curso a distancia en 2023. Las variables independientes incluyeron características demográficas, situación laboral y aspectos profesionales asociados a la finalización y el éxito del curso. De las 969 personas matriculadas, el 60,2 % completó el curso, y la finalización fue más probable entre los funcionarios (71 %). Los médicos, los profesionales con más experiencia en el campo y los que completaron el curso en menos de 60 días obtuvieron mejores resultados. El análisis estadístico destacó el empleo y

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el tiempo de dedicación al trasplante de médula ósea (TMO) como factores determinantes del éxito.

Palabras clave: Educación a distancia en salud; Finalización de curso; Factores predictivos de éxito académico.

Received on: 2024-11-11

Accepted on: 2024-06-21

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

1 INTRODUCTION

Distance Education (EaD, as it is called in Brazil) has the potential to overcome challenges faced by health professionals, such as travel issues, lack of adequate space for face-to-face classes, difficulty in accessing professionals in remote regions, and obstacles related to motivation (Moore; Kearsley, 2007). According to Covalsky and Mota (2016), distance education not only offers flexibility and autonomy to professionals but also presents itself as an effective solution to meet knowledge needs and reach a wider audience in need of training.

Carbonero (2016) highlights that distance education in the health sector has contributed significantly to the qualification and updating of professionals, promoting the improvement of care in regions with a lack of medical assistance. This modality favors continuing education, supports collaborative research, improves the quality of medical care, reduces the interval between diagnosis and therapy, expands specialized services, and offers greater autonomy to health professionals.

Thus, offering courses in the distance education modality meets the specific needs of the health sector, while providing more accessible and personalized learning opportunities for professionals, therefore promoting continuous improvement in the delivery of health services.

Despite the benefits, dropout and poor academic performance remain significant challenges in distance education. The ABED report (2022) indicates that the dropout rate can reach 25%, and self-instructional courses may pose additional challenges. Da Silva and Drumond e Castro (2022) suggest that these self-instructional formats may affect student motivation, increasing the risk of attrition.

With the growing interest in distance education courses (Brasil, 2022), it is important to highlight the challenges faced in the production and systematization of knowledge in this educational modality. It becomes imperative to address issues related to the characteristics of the target audience as an essential element in the process of planning and evaluating these distance education courses (Carvalho; Abbad, 2006).

In this context, Zerbini and Abbad (2010) emphasize that the individual characteristics of the student can play a significant role in the results of distance education actions, more so than in presential contexts. This is because, in distance education courses, learning depends more on the student's self-management and personal commitment than on educational resources (Vasconcelos, 2024). This distinction highlights the importance of considering student autonomy and engagement as key factors in the effectiveness of distance learning courses.

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

Considering the growing importance of distance education in the educational scenario (Brasil, 2022) and the continuous training of health professionals, the identification of the factors that positively influence the performance of distance education courses in this area becomes fundamental in the development of effective strategies aimed at retaining students and optimizing their participation in future offerings of this educational model.

Therefore, the objective of this study is to analyze the profile of students and the association of individual characteristics with the completion rate and success in self-instructional distance education courses. This study seeks to contribute to the existing literature and educational practice in distance education by identifying factors that influence completion and academic success in distance health education courses. Based on the profile of students and their characteristics, the study can provide relevant contributions to the development of strategies aimed at improving student retention and engagement.

2 MATERIALS AND METHODS

A retrospective cohort study was conducted with participants of both sexes, over 18 years of age, enrolled in the self-instructional distance education course "Qualification of the SUS Bone Marrow Transplant Program - More TMO". The course, composed of 11 modules with a total workload of 30 hours, addressed the pre-, intra-, and post-transplant phases and is specific for health professionals. The study included students enrolled between January 30 and August 31, 2023, followed until December of the same year.

The "More TMO" course is an initiative of the Institutional Development Support Program of the Unified Health System (PROADI-SUS), developed by the Hospital Beneficência Portuguesa (BP). This program was developed by a team of medical and multidisciplinary professionals from BP, all with extensive experience in Bone Marrow Transplantation (TMO), with the support of pedagogical specialists in distance education. Intended for health professionals such as doctors, nurses, physiotherapists, nutritionists, occupational therapists, pharmacists, psychologists, and social workers, among others, preferably involved in the field of TMO in SUS transplant centers.

The EaD Course was hosted at a Moodle Virtual Learning Environment (VLE). Participants were voluntarily recruited and enrolled through a program announcement on the Ministry of Health's

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PROADI website, as well as through social media, email marketing, and other communication channels. Through this platform, administrative reports were generated that included information such as course start date and duration, access records, completion of activities, modules, tasks completed, and time spent in the course in days and minutes. During enrollment, demographic data were collected from the student, including gender, age, city, and state of residence, as well as information on education (high school, undergraduate, lato sensu, and strictu sensu postgraduate), type of employment relationship (CLT, civil servant, service provider/self-employed professionals), and time dedicated to the TMO (<1 year, 1 to 5 years, and >5 years).

The professional groups enrolled in the course included nurses, physicians, pharmacists, nursing technicians, nursing assistants, community health workers, social workers, biomedical scientists, physical therapists, health managers, nutritionists, dentists, psychologists, occupational therapists, clinical analysts, and others. For data analysis, nurses, physicians, and pharmacists represented individual categories; nursing technicians were analyzed with nursing assistants; and other professionals were grouped into two subgroups: G1 - including nutritionists, physiotherapists, biomedical scientists, health managers, dentists, and clinical analysts; G2 - including social workers, psychologists, occupational therapists, and others.

The outcomes analyzed included course completion and course success (among those who completed, how many achieved grades ≥ 8). The evaluation mechanism consisted of a single questionnaire administered at the end of the course. This questionnaire contained 10 questions covering the content and topics relevant to the course. Each student had up to 3 attempts to pass the questionnaire.

A descriptive analysis of the data was performed using absolute (n) and relative (%) frequencies, as well as measures of central tendency (mean and median) and dispersion (standard deviation, minimum and maximum). Comparisons between qualitative variables were made using the chi-square test. For quantitative variables, the Shapiro-Wilk test was first used to test for adherence to the normal curve. The non-parametric Mann-Whitney test was used to compare categorical outcomes (course completion and course success) with quantitative variables.

The Kaplan-Meier product-limit estimator was used to analyze the time in days between the date of enrollment and the dropout or completion status. The log-rank test was used to compare curves. Cox regression analysis, which estimates the probability of an event occurring over time, was used to assess the risk of course completion using the hazard ratio (HR) effect measure and its respective 95%

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confidence interval (95%CI). For course success, multiple binary logistic regression analysis, appropriate for dichotomous dependent variables, was performed to identify associations, using the odds ratio (OR) effect measure and 95%CI for the outcome of course success. In the multiple analyses, significant variables were included, as well as those with p-values < 0.250. All analyses were performed in RStudio, version 4.1.2.

3 RESULTS

Of the sample of 969 enrolled participants, 583 completed the course, for a completion rate of 60.2%. The median age of all participants was 35 years, ranging from 20 to 66 years, and 83.7% were female. The project had a national scope, with enrolled participants coming from the five regions of the country. The percentage distribution of enrolled participants by region was: Southeast (49.3%), Northeast (27.2%), South (15.5%), Central-West (7.7%), and North (0.6%).

Figure 1 illustrates the course enrollment rate. The states in white had no enrollments, while the states in gray had enrollments but none of them completed the course. Among the states with enrollments, São Paulo led with 27.4%, followed by Minas Gerais with 12.9% and Bahia with 8.1%.

Figure 1 – Distribution of course participants in Brazilian states, according to adherence rate

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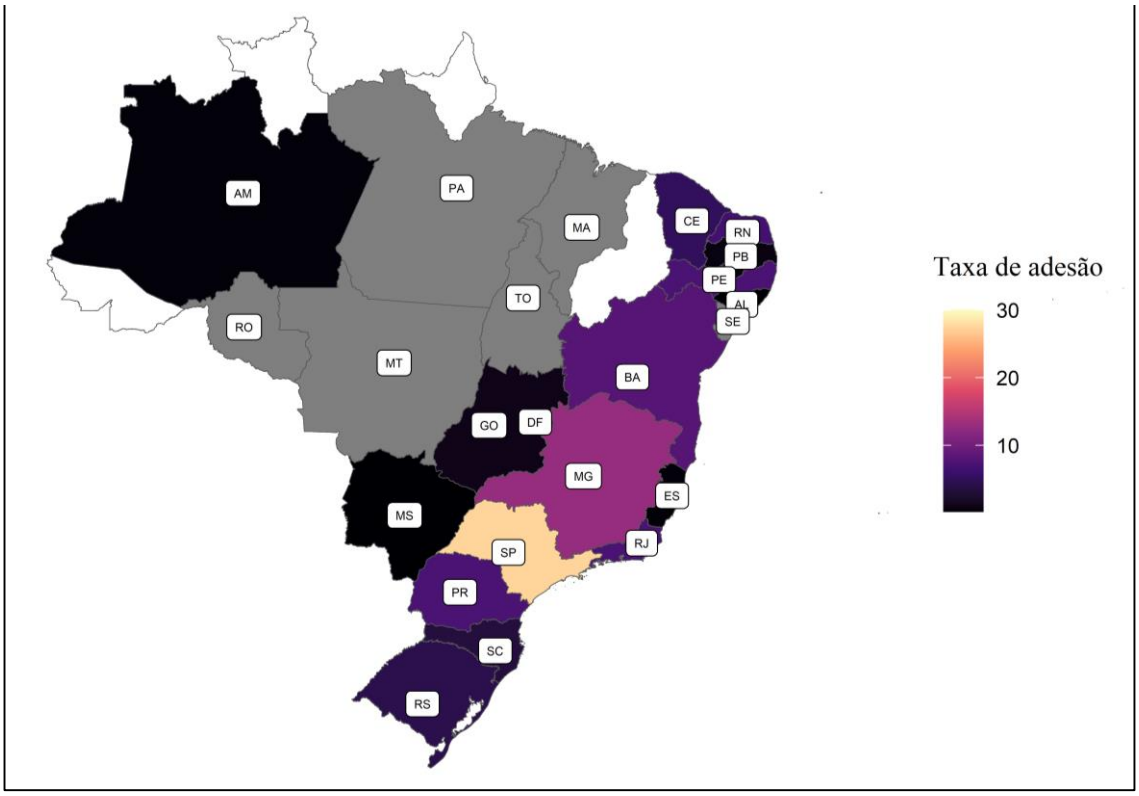


Source: Prepared by the authors.

Figure 1 analyzes the relationship between demographic and professional variables and course completion. It can be seen that age is statistically associated with course completion, with the percentage of professionals who completed the course increasing as the age group increases (p=0.012). Professionals with a Master's and/or Doctorate degree have a higher rate of course completion compared to the other categories (p=0.009). Furthermore, it can be seen that the proportion of graduates increases as the time devoted to the field of study increases (p=0.014). Regarding the type of employment relationship (p<0.001), it can be seen that professionals who have passed a public exam have a higher rate of course completion (70%) compared to those with CLT employment relationships (60%) and others (47%).

When analyzing the outcome of "course success", a statistically significant association was found for the profession variable (Table 1). The group of physicians had the highest proportion of success in the course, with 84% indicating that they achieved grades equal to or higher than 8, compared to the other professions (p<0.001). The number of attempts variable also showed a significant association, and professionals who made 3 attempts had a lower percentage of success compared to those who made 1 or 2 attempts (p=0.002). It is important to highlight that the median

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

time spent on the course in days was lower among professionals who obtained a grade equal to or higher than 8, compared to professionals with lower grades (p=0.002).

Table 1 – Association of demographic and professional characteristics with course completion outcomes

Variáveis	Curso concluído (969) não (n=386) n (%)	Curso concluído (969) sim (n=583) n (%)	p*	Sucesso no curso (583) < 8 (n= 285) n (%)	Sucesso no curso (583) ≥ 8 (n=298) n (%)	p*
Sexo						
Feminino	323 (40%)	488 (60%)	1,00	243 (50%)	245 (50%)	0,377
Masculino	63 (40%)	95 (60%)		42 (44%)	53 (56%)	
Faixa etária (tercis)						
20 – 32	163 (46%)	194 (54%)		100 (51%)	98 (49%)	
33 – 39	122 (38%)	198 (62%)	***0,012***	86 (44%)	108 (56%)	0,289
40 – 66	101 (35%)	191 (65%)		99 (52%)	92 (48%)	
Escolaridade						
Ensino médio/técnico	27 (51%)	26 (49%)		12 (46%)	14 (54%)	
Graduação	79 (45%)	96 (55%)	***0,009***	51 (53%)	45 (47%)	0,702
PG Lato sensu	241 (40%)	365 (60%)		179 (49%)	186 (51%)	
PG Stricto sensu	39 (29%)	96 (71%)		43 (45%)	53 (55%)	
Tempo de dedicação TMO						
< 1 ano	171 (45%)	207 (55%)		111 (51%)	107 (49%)	
1 a 5 anos	134 (38%)	218 (62%)	***0,014***	106 (51%)	101 (49%)	0,227
> 5 anos	81 (34%)	158 (66%)		68 (43%)	90 (57%)	
Tipo de Vínculo						
CLT	246 (40%)	373 (60%)		190 (51%)	183 (49%)	
Concursado	61 (30%)	140 (70%)	***<0,001***	64 (46%)	76 (54%)	0,41
Outros	79 (53%)	70 (47%)		31 (44%)	39 (56%)	
Profissão						
Enfermeiro	211 (38%)	341 (62%)		183 (54%)	158 (46%)	
Médico	25 (36%)	44 (64%)		7 (16%)	37 (84%)	
Farmacêutico	35 (42%)	48 (58%)	0,114	21 (44%)	27 (56%)	***<0,001***
Técnico/auxiliar de	31 (44%)	39 (56%)		20 (51%)	19 (49%)	
G1	42 (36%)	75 (64%)		37 (49%)	38 (51%)	
G2	42 (54%)	36 (46%)		17 (47%)	19 (53%)	
Nº de tentativas						
1				127 (46%)	148 (54%)	***0,002***
2				98 (45%)	119 (55%)	
3				60 (66%)	31 (34%)	
Tempo de seguimento do curso em dias						
Mediana (mínimo-máximo)				162 [0 - 312]	124 [4 - 315]	***0,002***

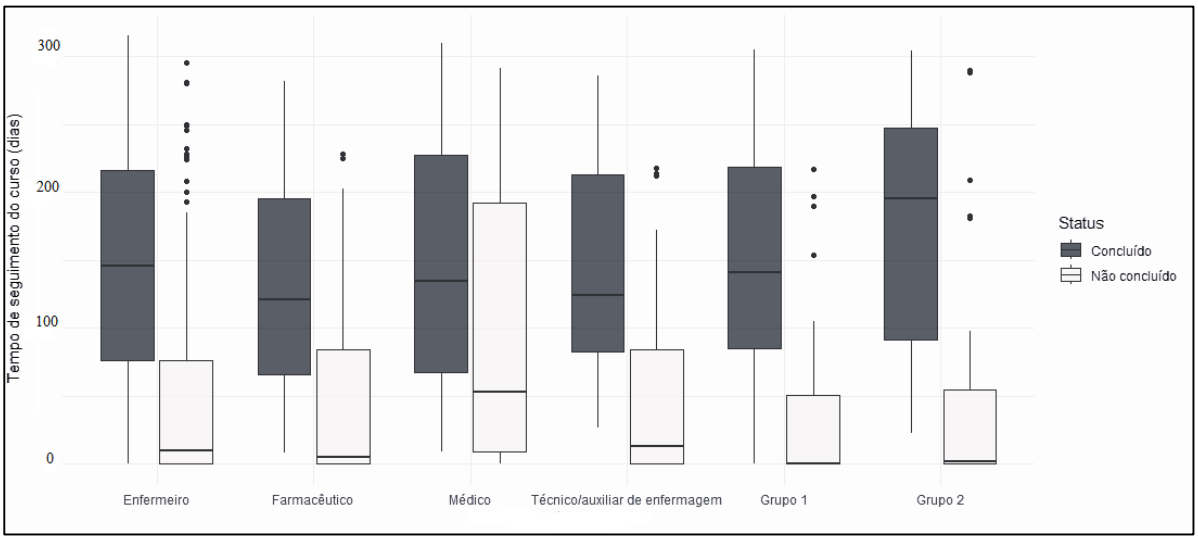
* Chi-square

Source: Prepared by the authors.

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

Figure 2 shows the distribution of length of stay by professional group. In this analysis, physicians stand out, showing a statistically significant difference between the graduate group and the non-graduate group (p=0.020). Among the graduates, 45.7% had dedicated more than 5 years to TMO compared to 28% of the non-graduates (p=0.294); 34.0% had a public service contract compared to 20% of the non-graduates (p=0.230). And in terms of the time, in days, between enrollment and entry into the course, those who completed were shorter than those who did not (8 versus 18; p=0.087). Another important point is that the median length of stay in the course for noncompleters was 53 days, with a minimum of 9 days and a maximum of 192 days.

Figure 2 – Distribution of length of stay of professionals enrolled in the course



Source: Prepared by the authors

The analysis of the probability of staying in the course was done in minutes, considering the maximum value of 1800 (30 hours). During this interval, the average probability of staying in the course was 63%. At 150 minutes this probability was 84% and at 270 minutes it was 75%. There were no differences in retention rates between men and women or by occupation. Figure 3 shows statistically significant differences between age groups (p=0.030 - A), educational level of students (p=0.006 - B), time spent on TMO (p=0.026 - C) and type of professional relationship (p<0.001 - D).

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

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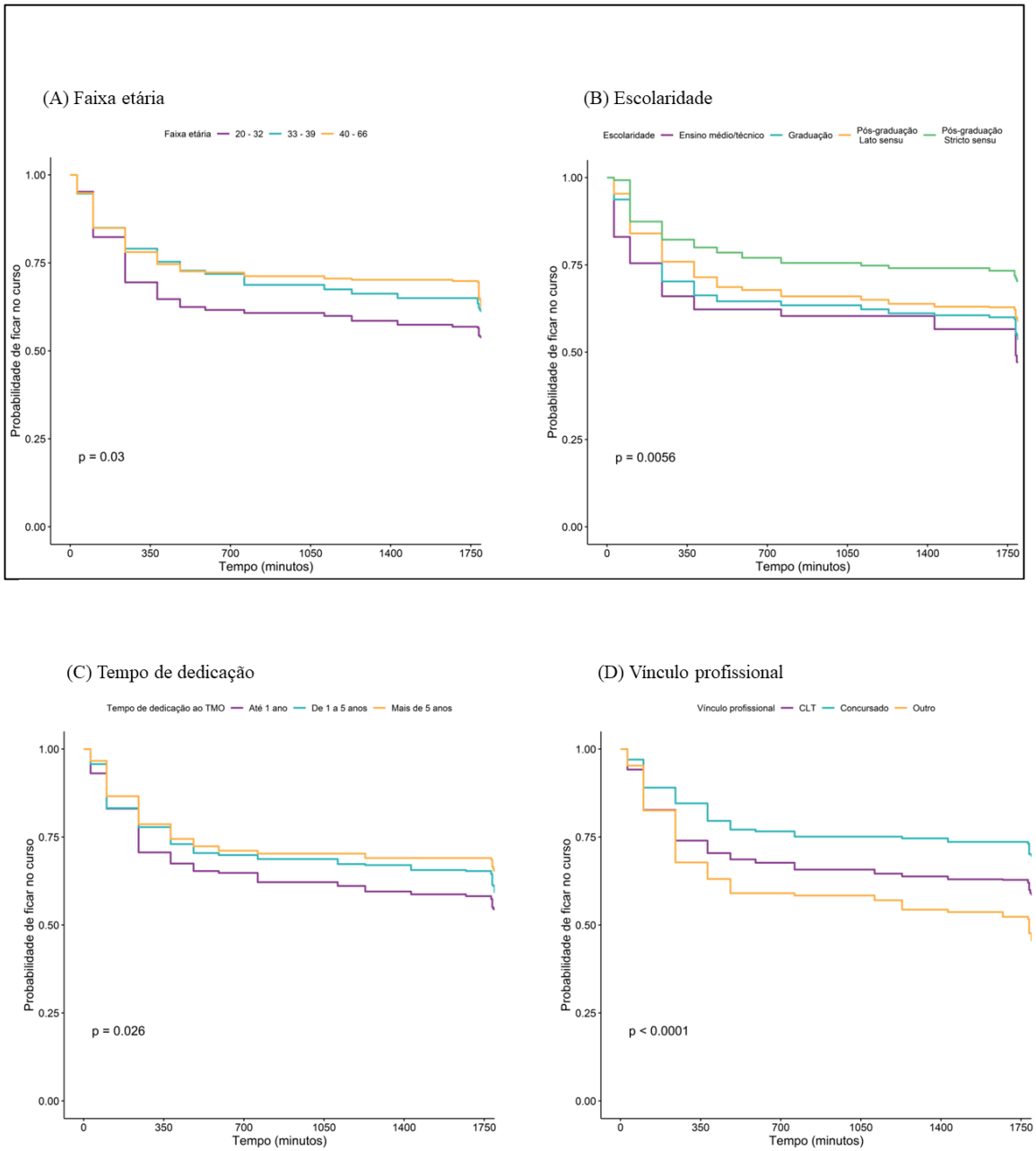
Figure 3 – Probability of professionals remaining on the course in minutes, according to demographic and professional characteristics



Source: Prepared by the authors.

In Table 2, the type of employment relationship showed a statistically significant difference. In 120 days, the probability of completing the course was 51% for the professionals who had passed the public exam, that is, almost half of this group had completed the course, while for the CLT group this rate was 71% and 62% for the other category (p<0.001).

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

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Table 2 – Probability (%) of course completion in days, according to demographic and professional characteristics

Variáveis	Probabilidade (%) de concluir o curso em dias								p
	30	60	90	120	150	180	210	240	*(log-rank)*
Geral	94	86	75	65	55	44	34	21	
Sexo									
Feminino	95	88	77	66	57	45	34	21	0,74
Masculino	89	77	65	57	47	38	33	20	
Faixa etária (tercis)									
20 – 32	95	88	73	63	51	42	32	21	
33 – 39	93	82	74	65	57	45	36	19	0,91
40 – 66	95	87	79	67	57	46	34	22	
Escolaridade									
Ensino médio	100	91	82	66	59	44	36	16	
Graduação	93	82	73	62	50	40	31	23	0,62
PG Lato sensu	94	87	77	67	58	47	36	21	
PG Stricto sensu	92	86	71	62	50	38	31	18	
Tempo de dedicação TMO									
< 1 ano	93	85	73	65	55	44	32	18	
1 a 5 anos	94	86	79	64	54	44	37	23	0,88
> 5 anos	95	88	75	65	57	46	33	20	
Tipo de Vínculo									
CLT	95	88	81	71	60	48	38	23	
Concursado	92	81	64	51	43	32	23	13	***<0,001***
Outros	92	84	72	62	56	48	38	23	
Profissão									
Enfermeiro	93	86	76	65	55	44	33	20	
Médico	95	84	72	62	58	46	40	27	
Farmacêutico	94	84	72	59	49	42	28	9.8	0,08
Técnico/auxiliar	96	86	77	62	55	45	37	21	
G1	96	88	76	66	48	37	30	18	
G2	98	92	80	73	70	63	52	37	
Nº de tentativas									
1	93	84	72	60	51	40	28	15	
2	92	82	68	59	49	39	31	17	0,73
3	90	83	76	61	44	32	24	18	

Source: Prepared by the authors

Table 3 shows the independent factors for course completion in days and course success as measured by the completion grade. In the Cox multiple regression analysis, adjusted for age and number of attempts, the independent factors for course completion were: being a civil servant or having another employment relationship (service provider, entrepreneur, freelancer) compared to

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CLT professionals. In particular, civil servants had almost twice the risk of completing the course compared to CLT professionals (aHR = 1.71; 95%CI 1.39 - 2.11), as did other categories of professionals (aHR = 1.37; 95%CI 1.04 - 1.79). Regarding profession, group G2 showed a protective factor for course completion compared to pharmacy professionals (reference category). Professionals in G2 had a 44% lower risk (aHR = 0.56; 95%CI 0.36 - 0.86).

Regarding the grade (Table 3), it is observed that the independent factors include age, which shows an inverse relationship. The older the professional, the greater the probability of obtaining a grade equal to or higher than 8 (p=0.011); time dedicated to BMT > 5 years (aOR=1.82; 95%CI 1.12 - 2.97); being a physician, with a probability approximately 4 times greater (aOR=4. 21; 95%CI 1.57 - 12.40); professionals who made between one and two attempts at the test were twice as likely to achieve better performance (p<0.050); and completing the course in up to 60 days (aOR=2.19; 95%CI 1.36 - 3.56).

Table 3 – Cox multiple regression and multiple logistic regression analyses

Variáveis	Finalizar o curso			nota ≥ 8		
	aHR*	IC95%	P	aOR**	IC95%	p
Idade (contínua)	0,99¥	0,98 - 1,00	0,053	0,97¥	0,95 - 0,99	***0,011***
Tempo de dedicação TMO						
< 1 ano				Ref		
1 a 5 anos				1,26	0,83 - 1,91	0,3
> 5 anos				1,82	1,12 - 2,97	**0,016**
Tipo de Vínculo						
CLT	Ref					
Concursado	1,71	1,39 - 2,11	***<0,001***			
Outros	1,37	1,04 - 1,79	***0,024***			
Profissão						
Farmacêutico	Ref			Ref		
G2	0,56	0,36 – 0,86	***0,009***	1	0,40 - 2,47	1
G1	0,74	0,51 – 1,06	0,1	0,82	0,38 - 1,76	0,6
Enfermeiro	0,78	0,58 – 1,05	0,1	0,69	0,36 - 1,29	0,2
Médico	0,66	0,43 – 1,01	0,055	4,21	1,57 - 12,4	***0,006***
Técnico/auxiliar de	0,76	0,50 – 1,15	0,2	0,73	0,29 - 1,79	0,5
Nº de tentativas						
3	Ref			Ref		
1	0,85	0,67 - 1,08	0,2	2,14	1,28 - 3,63	***0,004***
2	0,84	0,65 - 1,08	0,2	2,33	1,37 - 4,00	***0,002***
Tempo de seguimento do						
Mais que 210 dias				Ref		
60 a 90 dias				1,63	0.96 - 2,80	0,074
90 a 120 dias				1,56	0,90 - 2,73	0,11
Até 60 dias				2,19	1,36 - 3,56	***0,001***

* reference category = do not complete; ** reference category = grade < 8.

Source: Prepared by the authors.

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

3.1 DISCUSSION

In the health sector, although initial training in distance education mode faces limitations, especially in fields such as medicine and psychology, it is in continuing education and in-service training that distance learning has emerged as a valuable alternative to improve the quality of services provided. As highlighted by Monteiro et al. (2016), healthcare requires a constant search for improvement and updating, and distance learning is emerging as an effective tool to facilitate these processes.

The COVID-19 pandemic caused by SARS-CoV-2 has had a significant impact on medical education and related health fields. Due to the limitations of social distance, the completion of presential courses has become infeasible. Therefore, one strategy adopted was the implementation of distance education methods to mitigate the impact of these measures (Gomes et al., 2020).

The study by Ghasempour et al. (2023) showed that the abrupt transition to online learning, driven by the pandemic, was well-received by most students. This mode of delivery offered several advantages, such as flexibility in time and location, access to a wide range of educational materials, and the ability to interact with peers and teachers in a virtual environment. However, this change also brought challenges, as Pohorilyak, Zheliznyak, and Feger (2023) point out. Negative effects on students' physical and mental health were observed, with reports of fatigue, anxiety, and stress. In addition, a decline in academic performance was noted for some students, possibly due to the difficulty of adapting to the new learning environment and the lack of adequate structure for distance education.

However, distance education is consolidating as a viable option, ensuring greater access to classes for students in remote regions who face budgetary and professional availability challenges (Brasil, 2022; Vasconcelos 2024). This reduces the need to travel to large urban centers. In addition, interactive platforms are less expensive and more attractive to academic content producers.

In our study, we found that almost half of the students in the self-instructional course were from the Southeast region, which is consistent with data from the 2021 Distance Education Census (ABED, 2022), demonstrating not only participation but also the predominance of course offerings in this region. This can be attributed to the greater number of professionals specialized in the country's main urban centers located in this region. As far as the participants are concerned, extensive promotion

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of the courses and quality access to the Internet are essential to ensure participation.

In the context of the TMO, it is essential to extend training to regions with deficiencies in access to medical care. As highlighted in a study by Magedanz et al. (2022), transplant centers (CTs) are distributed in several federal units (UFs), but the equal distribution of these centers to serve all patients who need this procedure is still a distant goal at the national level. It is important to note that approximately two-thirds of these centers are concentrated in the Southeast region.

In this study, our goal was to profile the participants to understand their adherence and success throughout the course as measured by the final grade. The 60.2% completion rate for the EaD More TMO course was comparable to that observed in other EaD courses, in higher education and lower technical courses, which can reach 85% (ABED, 2022).

Previous studies have highlighted that the main attractions are convenience, the comfort of not having to travel, and flexible schedules (Elsayed; Le-Khac; Jurcut, 2021; Mortagy et al., 2022; Edward et al., 2023). However, there is a loss of interaction with teachers and colleagues (Mortagy et al., 2022), which can affect the sense of teamwork, recognition of leadership, and socioemotional competence. Domestic distractions and connectivity issues have been identified as major barriers to distance learning (Mortagy et al., 2022; Edward et al., 2023).

Among the determinants of course completion, professionals linked to the public service or working as freelancers/self-employed stand out, as they obtained better results. It is assumed that professionals who have passed the public service exams are encouraged to continue their education, as some courses contribute to their career points and can lead to salary bonuses. In addition, the flexibility of schedules to take the course during working hours can be a facilitating factor for these professionals. The incentive for the improvement of civil servants is supported by Constitutional Amendment No. 19 (Brazil, 1998), which establishes in Art. 5, § 2, establishes that the States, the Federal District, and the Union must provide schools for the training and improvement of civil servants, with participation in the courses being one of the requirements for career advancement. In addition, Law No. 18.112 (Brasil, 1990, art. 87) establishes that "after each five-year period of effective exercise, the server may, in the interest of the administration, leave the exercise of the effective position, with the corresponding remuneration, for up to three months, in order to participate in a professional training course".

Like freelancers and the self-employed, those who seek to remain active in the labor market

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

are constantly seeking to improve and specialize in order to stay current and competitive. Rocha, Ehrl and Monasterio (2020) point out that for each additional year of training, these professionals can expect a salary increase of about 10%.

In terms of student groups, those who were not trained in the clinical area of TMO, such as professionals dedicated to the social or psychological care of transplant patients, had a higher risk of not completing the course. This may be due to a lack of knowledge of specific terminology and difficulty in understanding clinical discussions included in the course content. In the studies conducted by Ghasempour et al (2023) with students at Shahroud University of Medical Sciences, satisfaction with the field of study, especially in relation to clinical cases, was highlighted as one of the factors associated with the academic success of students. Therefore, the need for clearer dissemination of the course and the basic knowledge accompanying the modules is highlighted, in addition to the possibility of offering courses aimed at professionals from other fields that provide social and psychological support to TMO, not directly related to the health field of knowledge.

In terms of course performance, this study shows that younger students with more experience in the field of the course (more than 5 years) and with basic medical training tend to perform better. These findings are consistent with those observed in Ehrl's (2022) study, although the latter considered participation as an outcome. In addition, the Ehrl (2022) study highlighted that the female gender is associated with participation and course completion. Our research also found that the majority of students were female; however, this characteristic was not linked to course completion or superior performance. These profile data corroborate the research carried out by Vieira Borges Junior et al . (2024), based on the Higher Education Census from 2010 to 2020, which indicated a higher percentage of women in health courses. This is probably related to the predominant professional profile since the majority of students were nurses.

The analysis of factors related to student performance revealed that taking the final exam on the first or second attempt and completing the course within 60 days were among the significant aspects. Although the course offered three attempts to take the final exam, this did not result in higher student performance. On the contrary, those who chose between one and two attempts at the final exam proved twice as efficient in achieving better performance. This finding suggests that students who obtained good grades took up to two attempts at the final exam, possibly because they placed more value on their performance and wanted to consolidate their knowledge or improve their scores.

Furthermore, with regard to the length of the course, it was observed that a longer period did

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

not correlate with better performance. Students who performed well completed the course within 60 days. This finding suggests that a shorter completion time may be associated with greater student concentration and engagement, resulting in better use of the content. This highlights the importance of planning and appropriate instructional design for future distance learning courses (Dutra et al., 2023). It is recommended that consideration be given to the introduction of shorter completion periods, which encourage periodicity in study and continuous student engagement, in addition to promoting a sense of progress and achievement, aspects that can be fundamental to academic success (Filatro, 2023).

However, it is important to acknowledge some of the limitations of this study. One is the lack of data on why students who did not complete the course did not complete it. In addition, because the study focused on a specific TMO course for healthcare professionals, the generalizability of the results to other distance education courses in different settings may be limited. Voluntary participation in the course may introduce a self-selection bias, with more motivated individuals with a greater interest in the field being those who enroll and complete the course. In addition, demographic and professional information is based on self-reported data from participants, which may introduce bias or inaccuracy. Finally, the study does not control for external factors that may influence course completion, such as time availability, institutional support, or personal circumstances. These limitations highlight the need for future, more comprehensive, and detailed studies of the challenges and benefits of distance learning in healthcare.

4 CONSIDERATIONS

Based on the analysis of the data and results obtained in this study of the predictors of completion of a self-instructional distance education course in TMO for health professionals, some significant conclusions emerge. First, the course completion rate was 60.2%, which is comparable to other distance learning courses in higher education. This result suggests that this modality is a viable and attractive alternative for health professionals seeking improvement and updating, especially in specialized areas such as bone marrow transplantation (TMO). In addition, the implications of these findings for educational and professional practice are relevant, as the demographic and professional characteristics of the participants can inform the design and structure of future distance learning courses to maximize student adherence and success.

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

The applicability of the results of this research should be discussed in different contexts and specialties within the healthcare field, taking into account regional and institutional differences that may influence the effectiveness of the proposed strategies. This is essential to adapt the recommendations to the specific needs and challenges of each region or institution.

In addition, specific and actionable recommendations for educators and distance education program managers are important to guide the development of future courses. Among the suggestions are the need for a modular structure that includes everything from introductory content for leveling to more advanced modules for specialization, interactive teaching methods, and ongoing pedagogical support for students. These measures are designed to maximize student engagement and success throughout the course.

Participants' demographic and professional characteristics revealed significant associations with course completion and academic success. Professionals with a master's and/or doctoral degree had a higher rate of course completion compared to other categories of academic background. Furthermore, the identification of groups with a lower likelihood of completion, such as professionals without clinical training in TMO, is an important contribution to the planning of future courses. It is recommended that courses be adapted to better serve these groups, including introductory modules or additional support during the course. In addition, previous experience in the field of study, especially with more than five years of dedication to TMO, was positively correlated with course completion and academic success.

It was also observed that professionals with employment contracts, such as civil servants or the self-employed, were more likely to complete the course. This finding suggests that flexible schedules and incentives for continuing education can have a positive impact on participation in and completion of distance learning courses, especially among professionals seeking to improve their skills and knowledge. In this sense, the implementation of institutional policies and practices, such as offering credits for career advancement or salary bonuses, can be a relevant strategy to motivate the participation and engagement of a wider audience. Such measures can act as an additional incentive for professionals to invest in their academic and professional development.

On the other hand, professionals without training in the clinical area of TMO, such as those dedicated to social or psychological care, had an increased risk of not completing the course. This highlights the importance of clearly disseminating the course requirements and content, in addition to the possibility of offering specific courses for professionals from different areas of TMO support.

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

It is important to acknowledge the limitations of this study, including the lack of data on reasons for non-completion, which could provide deeper insights into the barriers faced by participants. For future research, we suggest conducting longitudinal studies that can track the long-term impact of distance education courses on participants' professional practice, providing a more comprehensive understanding of the impact of continuing education on professional performance.

In conclusion, the results of this study provide important information for the development of effective strategies in the design and implementation of distance learning courses for health professionals, particularly in the specialty of bone marrow transplantation. Understanding the factors that influence participation and academic performance allows a more targeted and effective approach in promoting continuing education and professional development in this specific context.

REFERENCES

ABED. Associação Brasileira de Educação a Distância. **Censo EAD.BR**: relatório analítico da aprendizagem a distância no Brasil 2020. InterSaberes, Curitiba: PR, 2022. Available at: https://abed.org.br/arquivos/CENSO_EAD_2020_PORTUGUES.pdf. Accessed on: May 23, 2024.

BRASIL. **Emenda Constitucional nº 19 de 4 de junho de 1998**. Modifica o regime e dispõe sobre princípios e normas da Administração Pública, servidores e agentes políticos, controle de despesas e finanças públicas e custeio de atividades a cargo do Distrito Federal, e dá outras providências. Available at: https://www.planalto.gov.br/ccivil_03/constituicao/Emendas/Emc/emc19.htm Accessed on: May 23, 2024.

BRASIL. **Lei no 8.112 de 11 de dezembro de 1990**. Dispõe sobre o regime jurídico dos servidores públicos civis da União, das autarquias e das fundações públicas federais. Available at: https://www.planalto.gov.br/ccivil_03/leis/l8112cons.htm. Accessed on: May 23, 2024.

BRASIL. Ministério da Educação. Instituto Nacional de Estudos e Pesquisas Educacionais (Inep). **Censo da Educação Superior:** Sinopse Estatística – 2022. Available at: https://download.inep.gov.br/educacao_superior/censo_superior/documentos/2022/apresentacao_censo_da_educacao_superior_2022.pdf. Accessed on: May 23, 2024.

CARBONERO, Flávia Cristina. Análise das publicações nacionais sobre educação a distância na área da saúde. Revista Brasileira de Aprendizagem Aberta e a Distância, [S. l.], v. 15, p. 51-59, 2016. DOI: 10.17143/rbaad.v15i0.273. Available at: https://abed.emnuvens.com.br/RBAAD/article/view/273. Accessed on: May 23, 2024.

CARVALHO, Renata Silveira; ABBAD, Gardênia. Avaliação de treinamento a distância: reação, suporte à transferência e impactos no trabalho. **Revista de Administração Contemporânea**, v. 10, n. 1, p. 95-116, 2006. Available at: https://www.scielo.br/j/rac/a/vzNZjG54nNmnLB85KzckYWz/. Accessed on: May 23, 2024.

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

COVALSKY Cristiana Mariani, MOTA, Junior Cesar Limites e possibilidades de estudantes na Educação a Distância (EAD). **Revista Unifebe**, v. 18, n. 1, p. 75-87, 2016. Available at: https://periodicos.unifebe.edu.br/index.php/RevistaUnifebe/article/view/399. Accessed on: May 23, 2024.

DA SILVA, Júlio Cesar; DRUMOND e CASTRO, Maria Cristina. Dimensões relacionadas à evasão na educação a distância: análise de uma proposta de categorização. Revista Valore, [S.l.], v. 7, p. 217-252, 2022. Available at: https://revistavalore.emnuvens.com.br/valore/article/view/1387. Accessed on: May 23, 2024.

DUTRA, Maksandra. Silva; CHAGAS, Deysianne Costa das; GARCIA, Paola Trindade; REIS, Regimarina Soares; OLIVEIRA, Ana Emília Figueiredo de. Efetividade e fatores associados ao Programa de Formação Gestão em Saúde. EmRede - **Revista de Educação a Distância**, [S. l.], v. 10, p. 1-15, 2023. DOI: 10.53628/emrede.v10i.925. Available at: https://www.aunirede.org.br/revista/index.php/emrede/article/view/925. Accessed on: Nov. 7, 2024.

EDWARD Anbrasi, *et al*. Self-paced online learning to improve knowledge competencies for hypertension among medical students in Uganda: A pre-post study. **PLOS Glob Public Health**, v. 3, n. 7, p. e0001609, 2023. DOI: 10.1371/journal.pgph.0001609. Available at: https://pubmed.ncbi.nlm.nih.gov/37459296/. Accessed on: May 23, 2024.

EHRL, Philipp. Impacto da qualificação nas trajetórias profissionais dos servidores públicos federais. **Escola Nacional de Administração Pública (Enap)**, Brasília, abr. 2022. Available at: http://repositorio.enap.gov.br/handle/1/7081. Accessed on: May 23, 2024.

ELSAYED, Mahmoud Said; LE-KHAC, Nhien-An; JURCUT, Anca Delia. Dealing with COVID-19 network traffic spikes [cybercrime and forensics]. **IEEE Security & Privacy**, v. 19, p. 90-94, 2021. Available at: https://www.computer.org/csdl/magazine/sp/2021/01/09336430/1qHMOKi3UKQ. Accessed on: May 23, 2024.

FILATRO, Andrea. **Design instrucional para professores**. Editora Senac São Paulo, 2023.

GHASEMPOUR, Saeed *et al*. Relationship between academic success, distance education learning environments, and its related factors among medical sciences students: a cross-sectional study. **BMC Medical Education**, v. 23, p. 1-10, 2023. Available at: https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-023-04856-3. Accessed on: May 23, 2024.

GOMES, Vânia Thais Silva *et al*. A Pandemia da Covid-19: Repercussões do Ensino Remoto na Formação Médica. **Revista Brasileira de Educação Médica**, v. 44, n. 4, p. e114, 2020. Available at: https://www.scielo.br/j/rbem/a/xZjx57LqBz9N6wcLPrTS9fs/?format=pdf&lang=pt Accessed on: May 23, 2024.

MAGEDANZ, Lucas *et al*. Transplante de células-tronco hematopoiéticas: iniquidades na distribuição em território brasileiro, 2001 a 2020. **Ciência & Saúde Coletiva**, v. 27, n. 8, p. 3239-3247, 2022. DOI: 10.1590/1413-81232022278.03142022. Available at: https://www.scielo.br/j/csc/a/Cyyg9fgw6vSCGZhZW8Pgj7D/?lang=pt. Accessed on: May 23, 2024.

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082

MONTEIRO, Ana Karine da Costa; MONTEIRO, Ana Karoline da Costa; ANDRADE, Elaine Maria Leite Rangel; LUZ, Maria Helena Barros Araújo; CAVALCANTI, Patrícia de Azevedo Lemos. Educação permanente à distância sobre a prevenção de úlcera por pressão. **Revista Enfermagem UERJ**, *[S. l.]*, v. 24, n. 1, p. e5733, 2016. DOI: 10.12957/reuerj.2016.5733. Available at: https://www.e-publicacoes.uerj.br/enfermagemuerj/article/view/5733. Accessed on: Jun. 12, 2024.

MOORE, Michael G.; KEARSLEY, Greg. **Educação a Distância**: uma visão integrada. São Paulo: Thompson Learning, 2007.

MORTAGY, Mohamed *et al*. Online medical education in Egypt during the COVID-19 pandemic: a nationwide assessment of medical students' usage and perceptions. **BMC medical education**, v. 22, p. 1-13, 2022. Available at: https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-022-03249-2. Accessed on: May 23, 2024.

POHORILYAK, Renata Yu., ZHELIZNYAK, Andreya. V., FEGER, Olga. V. Impact of distance education on students' health. **Wiad Lek.**, v. 76, n. 3, p. 640-644, 2023. Available at: https://pubmed.ncbi.nlm.nih.gov/37057793/. Accessed on: May 23, 2024.

ROCHA, Wilsimara Maciel.; EHRL, Philipp; MONASTERIO, Leonardo. Financiamento da educação superior no Brasil: o impacto do programa FIES nos salários dos trabalhadores formais. **Pesquisa e Planejamento Econômico**, v. 50, n. 2, p. 7-30, 2020. Available at: https://repositorio.ipea.gov.br/bitstream/11058/13081/1/PPE_v50_n2_Artigo1_financiamento_da_educacao.pdf. Accessed on: May 23, 2024.

VASCONCELOS, Luciana. **Características da Educação a Distância no Brasil**. Viseu, 2024.

VIEIRA BORGES JÚNIOR, Cândido *et al*. Maior inclusão social foi evidenciada na educação a distância? Análise da democratização de acesso ao ensino superior em saúde. **Educação Online**, Rio de Janeiro, v. 19, n. 45, p. e24194504, 2024. DOI: 10.36556/eol.v19i45.1484. Available at: https://educacaoonline.edu.puc-rio.br/index.php/eduonline/article/view/1484. Accessed on: May 23, 2024.

ZERBINI, Thaís; ABBAD, Gardênia. Aprendizagem induzida pela instrução em contexto de organizações e trabalho: uma análise crítica da literatura. **Cadernos de Psicologia Social do Trabalho**, v. 13, n. 2, p. 177-193, 2010. DOI: 10.11606/issn.1981-0490.v13i2p177-193. Available at: https://www.revistas.usp.br/cpst/article/view/25724. Accessed on: May 23, 2024.

DOI: http://doi.org/10.53628/emrede.v11i.1036 ISSN 2359-6082