

# Telemedicine and Telehealth Center of Goiás: Contribution to tele-education in the Central-West of Brazil

Estênio Da Costa Santos	Specialization - Administrative Analyst in Statistics at the Hospital das Clínicas of the Federal University of Goiás/Ebserh. Email: <a href="mailto:estenio.santos@ebserh.gov.br">estenio.santos@ebserh.gov.br</a>
Jônatas Abreu Fernandes	Specialization - Information Technology Manager at the Telemedicine and Telehealth Center of Goiás (NUTTs-GO) - Federal University of Goiás. Email: <a href="mailto:jonatasfdv@gmail.com">jonatasfdv@gmail.com</a>
Alexandre Chater Taleb	PhD - Professor and Supervisor in the Postgraduate Program in Health Sciences at the Faculty of Medicine of the Federal University of Goiás; Coordinator of the Telemedicine and Telehealth Center of Goiás (NUTTs-GO) - Federal University of Goiás. Email: <a href="mailto:alexandretaleb@ufg.br">alexandretaleb@ufg.br</a>
Cristina Célia de Almeida Pereira Santana	<b>Corresponding author:</b> PhD - Nurse in the Quality Management Sector of the Hospital das Clínicas at the Federal University of Goiás/Ebserh - Federal University of Goiás. Email: <a href="mailto:cris_santana@ufg.br">cris_santana@ufg.br</a> Orcid: <a href="https://orcid.org/0000-0002-2030-2191">https://orcid.org/0000-0002-2030-2191</a>

Date of Receipt: December 4, 2024 | Approval date: March 26, 2025

**Abstract** **Objective.** To analyze tele-education at the Goiás Telemedicine and Telehealth Center. **Methodology.** A descriptive, retrospective study with a quantitative approach evaluated the bank of web classes between January 2011 and July 2023. **Results.** There are 225 municipalities in Goiás linked (91.5% adherence). A total of 3,477 network points are connected, serving 2,445 teams and 10,113 professionals. During the period, 1032 video classes were made available, accounting for 637,434 accesses, of which 264,892 (41.6%) were synchronous and 372,542 (58.4%) asynchronous. Gradual growth in online access has been observed since 2021. There were 12 disciplinary areas involved and 227 contributing teaching professionals. The following stand out in terms of productivity: Nursing in 2017 (54.1%), Medicine in 2018 (38.5%) and Physiotherapy in 2021 (36.8%). Content focused on Psychosocial Care stands out, starting in 2020. **Conclusion.** The existence of thematic diversity, comprehensiveness in the availability of content, and multidisciplinary involvement in its construction were verified, criteria that make the Goiás Center aligned with the presuppositions of the Telehealth Program to contribute to the permanent education of professionals working in Primary Care. However, it is suggested to explore the perspective of professionals to better understand the impact of tele-education actions on their work processes with the community. **Key-words:** Tele-education; Continuing Education; Primary Health Care.

**Resumen** **Centro de Telemedicina y Telesalud de Goiás: contribución a la teleeducación en el Centro-Oeste de Brasil** **Objetivo.** Analizar la teleeducación en el Centro de Telemedicina y Telesalud de Goiás. **Metodología.** Estudio descriptivo, retrospectivo, con enfoque cuantitativo, en el que se evaluó el banco de web clases entre enero de 2011 y julio de 2023. **Resultados.** En Goiás hay 225 municipios vinculados (91,5% de adhesión). Estos cuentan con 3477 puntos de red conectados, con atendimento a 2.445 equipos y 10113 profesionales. Durante el periodo se pusieron a disposición 1032 videoclases con 637.434 accesos, que suelen ser 264.892 (41,6%) sincrónicos y 372.542 (58,4%) asincrónicos. A partir de 2021 se produjo un aumento gradual del acceso en línea. Se constató la participación de 12 áreas disciplinares y 227 docentes colaboradores. En términos de productividad se destacan: Enfermería en 2017 (54,1%), Medicina en 2018 (38,5%) y Fisioterapia en 2021 (36,8%). Se destacan contenidos enfocados en Atención Psicosocial a partir del año 2020. **Conclusión.** Se verificó la existencia de diversidad temática, integralidad en la oferta de contenidos y participación multidisciplinaria en su construcción, criterios que hacen que el Centro de Goiás esté alineado a los presupuestos del Programa de Telesalud para contribuir con la educación permanente de los profesionales que actúan en la Atención Primaria. Se sugiere, sin embargo, explorar la perspectiva de los profesionales para comprender mejor el impacto de las acciones de teleeducación en sus procesos de trabajo con la comunidad.

**Palabras clave:** Teleeducación; Educación Permanente; Atención Primaria de Salud.

**Resumo** **Núcleo de Telemedicina e Telessaúde de Goiás: contribuição para a teleeducação no Centro-Oeste do Brasil.** **Objetivo.** Analisar a teleeducação no Núcleo de Telemedicina e Telessaúde de Goiás. **Metodologia.** Estudo descritivo, retrospectivo, com abordagem quantitativa, no qual avaliou-se o banco de webaulas entre janeiro de 2011 e julho de 2023. **Resultados.** Existem 225 municípios goianos vinculados (91,5% de adesão). Nestes, estão conectados 3477 pontos de rede, com atendimento a 2445 equipes e 10113 profissionais. No período foram disponibilizadas 1032 videoaulas que contabilizaram 637 434 acessos sendo, 264 892 (41,6%) síncronos e 372542 (58,4%) assíncronos. Observou-se crescimento gradual ao acesso *on-line* a partir de 2021. Constataram-se 12 áreas disciplinares envolvidas e 227 profissionais docentes contribuintes. Citam-se como destaque em produtividade: Enfermagem em 2017 (54,1%), Medicina em 2018 (38,5%) e Fisioterapia em 2021 (36,8%). Destacam-se conteúdos voltados à Atenção Psicossocial, a partir de 2020. **Conclusão.** Verificaram-se a existência de diversidade temática, abrangência na disponibilização dos conteúdos e o envolvimento multidisciplinar em sua construção, critérios que fazem o Núcleo estar alinhado aos pressupostos do Programa Telessaúde para contribuir com a educação permanente dos profissionais lotados na Atenção Básica. Sugere-se, entretanto, explorar a perspectiva dos profissionais para melhor *compreensão* do impacto das ações de teleeducação em seus processos de trabalho junto à comunidade. **Palabras-chave:** Teleeducação; Educação Permanente; Atenção Básica à Saúde.

## INTRODUCTION

Tele-education is a strategy to promote learning through the mediation or use of technological and digital resources. The growing interest in this method, and the insertion and expansion of its use in the health area are mostly associated with its scope and usability in society and its versatility<sup>1-3</sup>.

In Brazilian public management, tele-education applied to health has been proposed as a viable alternative to collaborate in the implementation of the National Policy of Continuing Education, together with workers of Primary Care. The main goal of this qualification is to add quality to care and increase its effectiveness, especially in remote locations<sup>1,4-5</sup>. Thus, strengthening health education in Brazil is intrinsically linked to better execution of prevention and health promotion programs, in which the instrumentalization of workers and their continuous improvement will refine work processes and improve the support network for users of the Unified Health System – SUS<sup>4-7</sup>.

The Telemedicine and Telehealth Center of Goiás (NUTTs-Goiás), located at the College of Medicine of the Federal University of Goiás, began its activities in 2007 as one of the first nine Telehealth Centers in Brazil. As part of the pilot project, it contributed to the definition of the current Telehealth guidelines in the country, regulated by Ordinance 2,546, on October 27, 2011<sup>8</sup>.

NUTTs-Goiás initially developed an educational consultancy system for assistance through *online and offline Teleconsulting modalities*. This action enabled to guide various medical specialties and other areas such as Dentistry, Nursing, Nutrition, Psychology, and Physiotherapy, with a focus on Public Health. The Center's mission is to provide, through digital information and communication technologies, the necessary resources to promote the continuing education of professionals from Health Care Establishments who work, mainly, in Primary Care Units or the Family Health Strategy (ESF-Estratégia Saúde da Família).

Considering the pioneering nature of this work in the State of Goiás, highlighting the 17 years of activities developed with the Telessaúde Brasil Redes Program, it emphasizes the implementation of permanent education within the scope of the SUS, extended to society and the academic community. The aim of this work is to analyze tele-education in the Telemedicine and Telehealth Center of Goiás from 2011 to 2023.

## METHODOLOGY

This is a descriptive, retrospective study with a quantitative approach focused on discrete variables. To this end, a secondary data source was used, that is, data produced, stored, and provided by NUTTS-Goiás, regarding resources for tele-education.

To enhance the tele-education actions, the data were organized based on the year of reformulation of the National Telehealth Brazil Networks Program. Thus, the data collected was between January 2011 and July 2023.

For this survey, we focused on the educational content made available to promote qualification and continuing education in health, through the web classes modality. It included *online* access records (in real-time or synchronously) and the repository of recorded classes, with *offline* or asynchronous access.

In the data organization process, we categorized the following elements: number of classes per year, theme offered, disciplinary area involved, number of synchronous or asynchronous accesses per theme, and the number of teaching professionals or mediators participating. The discrete variables, expressed in numbers, were cataloged in Excel spreadsheets and organized into tables, for better structuring and analysis.

It is important to note that the project that allowed this study was reviewed and approved by the Human Research Ethics Committee of the Hospital das Clínicas at the Federal University of Goiás, CAAE No. 69098923.1.0000.5078, with substantiated opinion No. 6 096 464.

## RESULTS

According to data from the State Government, Goiás has 246 municipalities and a population of over seven million inhabitants. Known for its agricultural economy, it stands out as a logistical territory for the flow of production in the country and is undergoing demographic and economic growth, which increases the need for planning and investment in essential areas, such as primary health care<sup>9</sup>.

Currently, 225 municipalities participate in NUTTs-Goiás, representing 91.5% adherence to the Telehealth Program in the state. They are connected to 3,477 network points, serving 2,445 Family Health Strategy (ESF) teams and 10,113 professionals from accredited health establishments.

The Center develops its activities in two priority areas: care and education, through modalities such as Teleassistance, Teleconsulting, Telediagnosis, and Teleeducation. the following

resources are available: online web classes or lectures, courses, mini-courses, a repository of recorded classes, second formative opinion, access to the ARES Platform, access to the Moodle Platform for specialization and extension courses, learning objects, *online discussion forum*, *online* webinar, online matrix meetings and access to the Virtual Health Library.

Users who are registered on the Telehealth Goiás Platform can access all of these resources. They offer a wide range of themes, multiple

methodological approaches and flexibility for access, and a logistics system that aims to facilitate meeting the demands listed by professionals and provide better service to the community.

After the analysis of the data provided, we observed great interest among users in the video class resources, both in synchronous (*online*) and asynchronous (repository of recorded classes) formats. Table 1 shows the access to these contents between January 2011 and July 2023.

**Table 1.** Access to video classes on the Tele-Education Platform of the Telemedicine and Telehealth Center of Goiás (NUTTs-Goiás) between January 2011 and July 2023.

Period	Number of video classes	Number of synchronous accesses (%)	Number of asynchronous accesses (%)	Total hits
Jan-Dec/11	21	0 (0.0)	218 (100)	218
Jan-Dec/12	48	0 (0.0)	7 358 (100)	7 358
Jan-Dec/13	65	0 (0.0)	12 304 (100)	12 304
Jan-Dec/14	38	0 (0.0)	1 690 (100)	1 690
Jan-Dec/15	65	1 553 (22.7)	5 281 (77.3)	6 834
Jan-Dec/16	97	917 (7.5)	11 264 (92.5)	12 181
Jan-Dec/17	122	475 (0.9)	50 147 (99.1)	50 622
Jan-Dec/18	87	2 419 (3.7)	63 563 (96.3)	65 982
Jan-Dec/19	104	32 982 (26.8)	90 097 (73.2)	123 079
Jan-Dec/20	110	32 975 (34.5)	62 653 (65.5)	95 628
Jan-Dec/21	114	50 415 (57.9)	36 712 (42.1)	87 127
Jan-Dec/22	97	84 043 (86.2)	13 442 (13.8)	97 485
Jan-Jul/ <sup>23</sup>	64	59 113 (76.8)	17 813 (23.2)	76 926
Total 2011-2023	1 032	264 892 (41.6)	372 542 (58.4)	637 434

Source: Goiás Telehealth Center Database, Brazil. \* Data from January to July 2023.

In this period, 1,032 video classes were produced and offered, obtaining a total of 637,434 accesses, in which 264,892 (41.6%) were synchronous and 372,542 (58.4%) were asynchronous. It is important to highlight that between 2011 and 2014, only accesses to the contents in the repository were recorded. This fact was associated with the improvement and migrations of the information systems in the Center

Platform, as well as with the installation and expansion of network points in the municipalities participating in the Telehealth Program in Goiás.

Table 1 shows the gradual increase in synchronous access to video classes and its predominance from 2021 onwards. In 2022, this option reached 86.2% of access, which represents a growth of 28.3% compared to the previous year.

**Table 2.** Characterization of the disciplinary areas active in the Teleducation Platform of the Telemedicine and Telehealth Center of Goiás (NUTTs-Goiás) between January 2011 and July 2023.

Period	Number of video classes	Number of participating disciplinary areas	Number of teachers/mediators	Subject(s) with the most classes produced (number of classes)	(%)
Jan-Dec/11	21	4	4	Nursing (7)	33.3
Jan-Dec/12	48	5	6	Nursing (19)	39.6
Jan-Dec/13	65	5	7	Nursing (19)	29.2
Jan-Dec/14	38	4	6	Social Assistance (10); Speech Therapy (10)	26.3
Jan-Dec/15	65	5	8	Social Assistance (24)	36.9
Jan-Dec/16	97	6	21	Nursing (29)	29.9
Jan-Dec/17	122	9	19	Nursing (66)	54.1
Jan-Dec/18	87	8	32	Medicine (30)	34.5
Jan-Dec/19	104	7	31	Medicine (40)	38.5
Jan-Dec/20	110	8	36	Physiotherapy (38)	34.5
Jan-Dec/21	114	8	28	Physiotherapy (42)	36.8
Jan-Dec/22	97	8	21	Physiotherapy (31); Social Assistance (31)	32.0
Jan-Jul/ <sup>23</sup>	64	5	8	Social Assistance (17)	26.6
2011-2023	1 032	-	227	Social Assistance (269)	26.1

Source: Goiás Telehealth Center Database, Brazil. <sup>a</sup> Partial data - January to July 2023.

Table 2 shows data related to the disciplinary areas that collaborated in the production of the video classes. A total of 13 areas participated: Social Assistance, Biomedicine, Physical Education, Nursing, Pharmacy, Physiotherapy, Speech Therapy, Medicine, Nutrition, Dentistry, Psychology, Occupational Therapy, and Veterinary Medicine. From this year onwards, an annual average of seven disciplines participated in activities at the Center.

A total of 227 teachers or mediators were responsible for preparing and delivering the video classes with representation from all participating areas. Table 2 shows the productivity of the areas in which Nursing had 66 contributions in 2017 (54.1%), Medicine produced 40 contents in 2018 (38.5%), and Physiotherapy had 42 video classes in 2021 (36.8%).

It is worth noting that the discipline with the highest number of registered classes was Social

Assistance, encompassing topics from the areas of Psychology and Social Service. There were 269 classes available, corresponding to 26.1% of the classes analyzed in the period.

Also, 90 hybrid video classes were identified. Medicine taught 88 of these classes, Nursing offered 12, Physiotherapy 41, Dentistry 31, Social Assistance 2. and Biomedicine 2. The

remaining hybrid classes took place in Physical Education and Occupational Therapy 2.

During the database analysis, a predominance of themes focused on Primary Care or preventive Public Health was found. Table 3 lists the themes with the highest number of views and the selected access modality. The thematic centered on Psychosocial Care has increased since 2020.

**Table 3.** Presentation of the most accessed themes in the video classes on the Tele-Education Platform of the Telemedicine and Telehealth Center of Goiás (NUTTs-Goiás) between January 2011 and July 2023.

Period	Total number of synchronous and asynchronous accesses/year	Most accessed topic/year	Access type (number of hits/topic)	(%)
Jan-Dec/11	218	Nursing Audit	Asynchronous (119)	54.6
Jan-Dec/12	7 358	Physical Examination in Nursing	Asynchronous (751)	10.2
Jan-Dec/13	12 304	Quality as a Management Tool	Asynchronous (840)	6.8
Jan-Dec/14	1 690	Arboviruses/Dengue	Asynchronous (747)	44.2
Jan-Dec/15	6 834	Infectious diseases/ Chickenpox	Asynchronous (464)	6.8
Jan-Dec/16	12 181	Health Promotion	Asynchronous (1 173)	9.6
Jan-Dec/17	50 622	Interpretation of the Blood Count	Asynchronous (1 354)	2.7
Jan-Dec/18	65 982	Teaching children responsibility	Asynchronous (1 757)	2.7
Jan-Dec/19	123 079	Importance of play for children	Asynchronous (2 265)	1.8
Jan-Dec/20	95 628	Psychosocial Care during the Covid-19 Pandemic	Asynchronous (1 572)	1.6
Jan-Dec/21	87 127	Psychomuscular relaxation	Synchronous (1 871)	2.1
Jan-Dec/22	97 485	Self-knowledge, why is it important?	Synchronous (2 533)	2.6
Jan-Jul/ <sup>23</sup>	76 926	Speech delay in autism spectrum disorder	Synchronous (1 861)	2.4
2011-2023	637 434	Self-knowledge, why is it important?	Synchronous (2 533)	0.4

Source: Goiás Telehealth Center Database, Brazil. <sup>a</sup>Partial data - January to July 2023.

## DISCUSSION

The analysis of the database on video classes by NUTTs-Goiás showed significant information about the Center's contribution to continuing education. The following elements were considered for the discussion: accessibility to the resource, multidisciplinary, and the thematic approach.

One of the highlights is the opportunity to access video classes, in which the participation of professionals in synchronous mode shows a gradual growth from 2018 onwards and a predominance from 2021 onwards, reaching 86.2% of total accesses in 2022. This data is

significant when considering that the use of interactive technologies for health education aims to motivate professional participation, expand communication networks, and the exchange of knowledge and experiences. These principles are inherent to the proposal of continuing education within the context of the SUS <sup>5,10-11</sup>.

It is important to note that the concept of continuing education in health includes, among other assumptions, the need to enable learning in the workplace, preferably in a team, and to use a dynamic to associate the processes performed with the challenges in care practice <sup>5,10,12</sup>. The increasing participation of professionals in synchronous learning can improve this process. Also, it can help in the acquisition of knowledge and

tools for daily activities, the discussion within a multidisciplinary team about local demands and perceived vulnerabilities, and the motivation for sharing experiences in similar contexts<sup>12-14</sup>.

Greater access to online web classes also suggests the digital resources reach more individuals by the Center. This fact may be related to the expansion of telehealth services in the municipalities of Goiás, currently with 3,477, and better connectivity due to the expansion of the internet network. Despite this improvement in technological infrastructure and the continuous growth of the connection network, these factors are still restrictive when analyzing the adherence of professionals to distance education proposals. The incorporation of tele-education for the improvement of professionals requires the alignment with public management and adequate planning, financial incentives and timely innovation of physical and digital resources in service units<sup>7,15-16</sup>.

It can be inferred that other factors may have contributed to the growth in real-time access in recent years, such as greater engagement from professionals with the Program's proposals or even greater encouragement for their participation in health establishments. Studies highlight that raising awareness among professionals to incorporate tele-education tools into their routine remains a challenge. However, better adherence from teams is observed when there is more support from managers, more time available for educational actions, and more targeted approaches including topics listed by the employees, relevant to their daily lives<sup>12,14,17-18</sup>.

In addition to the increased accessibility, the Center showed a multidisciplinary approach in the production of educational resources. It was found that 12 disciplinary areas collaborated in this process representing 92.3% of the categories recognized as part of healthcare in Brazil, according to Resolution No. 218 of 1997 from the National Health Council<sup>19</sup>. The participation of Nursing and Medicine professionals from was relevant since these disciplines are the base for the training of public healthcare teams in the country. This result indicates that Telehealth Goiás is actively contributing to the fulfillment of one of the objectives defined by the National Primary Care Policy, which includes professional qualification in the ESF to increase problem-solving capabilities in the territories and promote, prevent and protect the health of individuals and communities<sup>6,15,20-21</sup>.

Therefore, the expansion and consolidation of Primary Care needs the principles of the SUS, such as comprehensiveness and its guidelines, and person-centered care, and longitudinality of care. To meet these goals, a multidisciplinary team and the exercise of interdisciplinarity approaches are essential, which

include collaborative work among professionals and their engagement with the community<sup>7,20,22-23</sup>. In this perspective, the cooperation of NUTTs-Goiás professionals in producing classes through disciplinary stands out. A total of 97.7% of the classes were carried out in partnership with the medical area and may show a movement of multidisciplinary construction to promote interdisciplinarity in the healthcare area.

The multidisciplinary approach to thematic content can help to understand the global or holistic dimension of care by clarifying the individual roles and the opportunity to recognize the skills of other professionals in the care process. This practice can provide effective spaces for strengthening communication, reducing conflicts, and stimulating interprofessional cooperation<sup>17, 22-24</sup>. From this perspective, it is important to acquire new knowledge and alternative or innovative ways to enhance the quality of healthcare. This reinforces the importance of an assertive choice about the content addressed in continuing education<sup>17, 22, 25</sup>.

When analyzing the thematic focus of the video classes produced by NUTTs-GO from 2011 to 2023, a wide variety of topics were found, including processes aimed at health promotion, prevention, diagnosis, treatment, and rehabilitation, as well as topics focused on management. However, since 2018, there has been greater number of views on Psychosocial Care. This can be seen in the class entitled "Self-knowledge, why is it important?", which has become the most accessed topic in the Center's history.

In Brazil, the constitutional right to health is guaranteed, including mental health care. The country's mental health policy was founded on principles such as deinstitutionalization. In 2011, a Psychosocial Care Network was established, providing multidisciplinary assistance and therapeutic care for the population, within the scope of Primary Health Care and in Psychosocial Care Centers (CAPS)<sup>26</sup>. These centers have numerous professionals who access tele-education resources. Thus, the growing interest in psychosocial care issues may be linked to better implementation of the Mental Health Program or to the increased demand for specialized care in Basic Health Units<sup>27-29</sup>.

Psychosocial care is a broad field with a significant impact on social and environmental issues on the mental health of a population. It is a multifactorial dimension that encompasses the entire community. Therefore, priority should be given to humanized care focused on the needs of individuals. This approach requires several care strategies, intersectoral operations, and integration in the care network<sup>28,30</sup>. Thus, conditions causing psychological distress represent public health problems, and their reception, treatment, and

monitoring are being widely discussed and assimilated by society. This construction may justify the need of expanding knowledge and reflection by professionals on the topics<sup>27-29</sup>.

During the Coronavirus pandemic in 2020, the importance of mental health care was highlighted amid social restrictions, economic recession, mourning, and uncertainty about the future. Consequently, initiatives were undertaken to minimize this damage to biopsychosocial health and to provide expanded and quality care to the population<sup>31-33</sup>. Also the pandemic scenario enabled NUTTS-GO to actively collaborate in disseminating information in this health care field. They provided professionals on the so-called "front line" access to resources such as video classes entitled "Psychosocial Care during the Covid-19 Pandemic" which received the highest viewed content in 2020.

In summary, the analysis of the video class bank at the Goiás Telehealth Center showed thematic diversity, comprehensiveness availability, and multidisciplinary involvement in its construction. These criteria make the Center aligned with the principles of the Telehealth Program and the National Policy to promote continuing education in Primary Care that is a pillar of the SUS. A limiting factor of the study was the structuring of the data in constant consolidation and aggregation of variables, which suggests the need for future investigations and analyses.

## CONCLUSION

The reflection on tele-education as a strategy to promote effective changes in work processes is very timely, adding more quality to health services and responding to the population's priorities in Primary Care units, although incipient. Regarding NUTTS-GO, it is necessary to emphasize that only a small fraction of its initiatives in this area have been presented. Tele-education modality encompasses a set of dynamic activities with continuous updating to serve professionals and the demands of the communities.

The results presented here will contribute to a reflection on the process of implementing tele-education of promoting Permanent Education in the SUS. They also highlight the initiatives developed by NUTTS-Goiás to support and mediate tele-education actions in expanding communication, in multidisciplinary professional qualification, and in improving the quality of health care in the Center-West. However, to better understand the dimension and effectiveness of the activities developed in tele-education, it is essential to periodically explore the perspective of professionals in health establishments, to whom the Telehealth Program is intended. Their responsibility, together with the

community, to provide an understanding of the real impact of these actions on their knowledge (knowledge) and their work processes (doing) is crucial.

## REFERENCES

1. Coutinho ML, Shiraishi CS, Ferreira EG, Coelho V. Telehealth as a strategy for continuing health education for SUS workers. *Bahian Journal of Public Health*. 2019;43(1):301-309. doi: 10.22278/2318-2660.2019.v43.n1.a2764
2. Ribeiro-Rotta RF (org.) et al. Telehealth [E-book]. Goiânia: Cegraf UFG; 2022. 65 p. ISBN 978-85-495-0502-6. [Accessed on: March 3, 2024]. Available at: <http://repositorio.bc.ufg.br/handle/ri/20704>
3. Marengo LL, Kozyreff AM, Moraes FS, Maricato LIG, Barberato -Filho S. Mobile technologies in health: reflections on development, applications, legislation and ethics. *Rev Panam Salud Publica*. 2022;46: e37. <https://doi.org/10.26633/RPSP.2022.37>
4. Matos R, Silva AB. Telehealth: a strategy for continuing education applied to practices and reorganization of work processes in primary care in the state of Bahia. *Information on the Agenda*. 2019;4(2):173-192. doi: 10.32810/2525-3468.ip.v4i2.2019.42643.173-192
5. Andrade KGM, Cortez EA, Pereira AV, Castro JA. The implementation of the permanent health education program: a contribution to strengthening the SUS. *Debates in Education*. 2020;12(26):97-108. doi: 10.28998/2175-6600.2020v12n26p97-108. [Accessed on March 2, 2024]. Available at: <https://www.seer.ufal.br/index.php/debateseducacao/article/view/8034>
6. Dolny LL, Lacerda JT, Natal S, Calvo MCM. Telehealth services as support for continuing education in primary health care: a proposal for an evaluation model. *Interface (Botucatu)*. 2019;23: e180184. <https://doi.org/10.1590/Interface.180184>
7. Sarti TD, Almeida APSC. Incorporation of Telehealth in primary health care in Brazil and associated factors. *Cad. Public Health*. 2022;38(4): e00252221. doi:10.1590/0102-311xpt252221
8. Brazil, Ministry of Health, Office of the Minister. Ordinance No. 2546 of October 27, 2011. Redefines and expands the Telessaúde Brasil Program, which is now called the National Telessaúde Brasil Networks Program (Telessaúde Brasil Redes). DOU No. 208 of October 28, 2011. Brasília, DF: Ministry of Health; 2011. [Accessed March 2, 2024]. Available at: [https://bvsms.saude.gov.br/bvs/saudelegis/gm/2011/prt2546\\_27\\_10\\_2011.html](https://bvsms.saude.gov.br/bvs/saudelegis/gm/2011/prt2546_27_10_2011.html)

9. Mauro Borges Institute (IMB), General Secretariat of Government (SGG). About Goiás. Goiânia: IMB; 2024. [Accessed on March 3, 2024]. Available at: <https://goias.gov.br/imb/sobre-goias/>
10. Brazil, Ministry of Health, Office of the Minister. Ordinance No. 278, of February 27, 2014. Establishes guidelines for the implementation of the Continuing Education in Health Policy, within the scope of the Ministry of Health (MS). DOU No. 42, February 28, 2014. Brasília, DF: Ministry of Health; 2014. [Accessed March 2, 2024]. Available at: [https://bvsms.saude.gov.br/bvs/saudelegis/gm/2014/prt0278\\_27\\_02\\_2014.html](https://bvsms.saude.gov.br/bvs/saudelegis/gm/2014/prt0278_27_02_2014.html)
11. Brazil, Ministry of Health, Executive Secretariat, Department of SUS Informatics. Digital Health Strategy for Brazil 2020-2028 [electronic resource]. Brasília, DF: Ministry of Health, 2020. [Accessed on March 1, 2024]. Available at: [http://bvsms.saude.gov.br/bvs/publicacoes/estrategia\\_saude\\_digital\\_Brasil.pdf](http://bvsms.saude.gov.br/bvs/publicacoes/estrategia_saude_digital_Brasil.pdf)
12. Oliveira IV, Silva EAP, Pereira PBA, Bonfim D, Zilbovicius C, et al. Continuing health education from the perspective of primary health care managers and workers. *Rer Inter Educ Health*. 2022;6:e4412. <https://doi.org/10.17267/2594-7907ijeh.2022.e4412>
13. Bernardes ACF, Coimbra LC, Serra HO. Use of the Telehealth Program in Maranhão as a tool to support Continuing Education in Health. *Rev Panam Salud Publica*. 2018;42: e134. <https://doi.org/10.26633/RPSP.2018.134>
14. Vendruscolo, C, Silva KJ, Araújo JAD, Weber ML. Continuing education and its interface with best practices in nursing in primary health care. *Cogitare Nursing*. 2021; v26: e72725. <http://dx.doi.org/10.5380/ce.v26i0.72725>
15. Harzheim E, Chueiri PS, Umpierre RN, Gonçalves MR, Siqueira ACS, et al. Telehealth as an organizational axis of universal health systems in the 21st century. *Rev Bras Med Fam Community*. 2019;14(41):1881. [http://dx.doi.org/10.5712/rbmfc14\(41\)1881](http://dx.doi.org/10.5712/rbmfc14(41)1881)
16. Vendruscolo, C, Trindade LL, Metelski FK, Vandresen L, Pires DEP, et al. Contributions of continuing education to expanded family health centers. *Esc. Anna Nery*. 2020;24(3):e20190273. <http://dx.doi.org/10.1590/2177-9465-ean-2019-0273>
17. Lamante MPS, Chirelli MQ, Pio DAM, Tonhom SFR, Capel MCM, et al. Continuing education and health practices: conceptions of a multidisciplinary team. *Qualitative Research Journal*. 2019;7(14):230-244. <https://doi.org/10.33361/RPQ.2019.v.7.n.14.268v>
18. Silva TPS, Sousa FOS, Leite GA, Pereira MEM, Gomes MCT, et al. Tele-education in health of human communication to face the triple endemic in Pernambuco, Brazil: an experience report. *Rev. CEFAC*. 2020;22(3):e9519. <https://doi.org/10.1590/1982-0216/20202239519>
19. Brazil, Ministry of Health, National Health Council. Resolution No. 218, March 6, 1997. Recognizes the professional categories of higher education health professionals. DOU No. 83, May 5, 1997. Brasília, DF: Ministry of Health; 1997. [Accessed March 2, 2024]. Available at: [https://bvsms.saude.gov.br/bvs/saudelegis/cns/1997/res0218\\_06\\_03\\_1997.html](https://bvsms.saude.gov.br/bvs/saudelegis/cns/1997/res0218_06_03_1997.html)
20. Brazil, Ministry of Health, Office of the Minister. Ordinance No. 2,436 of September 21, 2017. Approves the National Primary Care Policy, establishing the review of guidelines for the organization of Primary Care, within the scope of the Unified Health System (SUS). DOU No. 183 of September 21, 2017. Brasília, DF: Ministry of Health; 2017. [Accessed on March 2, 2024]. Available at: <https://www.in.gov.br/web/dou/-/portaria-n-2-436-de-21-de-setembro-de-2017-19308031>
21. Giovanella L, Bousquat A, Schenkman S, Almeida PF, Sardinha LMV et al. Coverage of the Family Health Strategy in Brazil: what the 2013 and 2019 National Health Surveys show us. *Ciência & Saúde Coletiva*. 2021;26(Suppl. 1):2543-2556. <https://doi.org/10.1590/1413-81232021266.1.43952020>
22. Kanno NP, Peduzzi M, Germani ACCG, Soárez PC, Silva, ATC. Interprofessional collaboration in primary health care from the perspective of implementation science. *Cad. Public Health*. 2023;39(10): e00213322. <https://doi.org/10.1590/0102-311XPT213322>
23. Jafelice GT, Ziliotto G, Marcolan JF. Multiprofessional work and comprehensive care in the perception of CAPS professionals. *Psicol. Estud.* 2024;29: e54902. DOI: 10.4025/psicoestud.v29i1.54902.. [Accessed on March 5, 2024]. Available at: <https://www.scielo.br/j/pe/a/mjsm79NpjfDtMyq5nQtq4Gv/#>
24. Gatto A, Monari ACP, Alencar LLR, Castillo MAM, Calil MM, et al. Beyond the limits of health: care from an interdisciplinary perspective. *Reciis – Electronic Journal of Communication, Information & Innovation in Health*. 2023;17(3):714-728. <https://doi.org/10.29397/reciis.v17i3.3408>
25. Pedreño JS, Cosme KO, Monteiro AX, Pinto ABS, Pierantoni CR, et al. Providing continuing education courses in health using the virtual learning platform: training health professionals

during the COVID-19 pandemic in Brazil in 2020 and 2021. *Journal of Technologies Information and Communication*. 2023;3(1):13961. <https://doi.org/10.55267/rtic/13961>

26. Brazil, Ministry of Health, Office of the Minister. Ordinance No. 3,088 of December 23, 2011. Institutes the Psychosocial Care Network for people with mental suffering or disorders and with needs resulting from the use of crack, alcohol, and other drugs, within the scope of the Unified Health System (SUS). DOU No. 251 of December 30, 2011. Brasília, DF: Ministry of Health; 2011. [Accessed on March 3, 2024]. Available at: [https://bvsms.saude.gov.br/bvs/saudelegis/gm/2011/prt3088\\_23\\_12\\_2011\\_rep.html](https://bvsms.saude.gov.br/bvs/saudelegis/gm/2011/prt3088_23_12_2011_rep.html)

27. Nunes VV, Feitosa LGGC, Fernandes MA, Almeida CAPL, Ramos CV. Mental health in primary care: the role of nurses in the psychosocial care network. *Rev. Bras Sick*. 2020;73( Suppl 1):e20190104. doi: <http://dx.doi.org/10.1590/0034-7167-2019-0104>

28. Gama CAP, Lourenço RF, Coelho VAA, Campos CG, Guimarães DA. Primary Health Care professionals facing Mental Health demands: perspectives and challenges. *Interface ( Botucatu )*. 2021;25:e200438. <https://doi.org/10.1590/interface.200438>

29. Makiyama M, Rizzotto MLF, Nasi C, Zack BT, Machineski GG. Mental health practices in primary care from the perspective of professional managers. *Rev baiana enferm*. 2023;37:e50944. <https://doi.org/10.18471/rbe.v37.50944>

30. Nunes CK, Olschowsky A, Silva AB, Xavier MS, Braga FS. Mental health in primary care: a rhizomatic network for childhood and adolescence. *Rev. Enferm . UFSM*. 2023;13(8):1-18. doi: <https://doi.org/10.5902/2179769271914>. [Accessed on March 7, 2024]. Available at: <https://pesquisa.bvsalud.org/portal/resource/pt/biblio-1418604>

31. Caetano R, Silva AB, Silva RM, Paiva CCN, Guedes ACCM, et al. Health information and education as a strategy for coping with covid-19 by Telehealth Centers. *Nursing Journal of the Central-West Mineiro*. 2020;10:e3888. doi: <http://doi.org/10.19175/recom.v10i0.3888>. [Accessed March 4, 2024]. Available at: <http://seer.ufsj.edu.br/recom/article/view/3888>

32. Campos-Filho AS, Souza CFQ, Cavalcante JMS, Souza NS, Silva KCL, et al. Tele-education strategies to combat COVID-19 in Northeastern Brazil. *Journal of Health Informatics*. 2023;15(Esp.). doi: 10.59681/2175-4411.v15.iEspecial.2023.1092. [Accessed on March 7, 2024]. Available at: <https://jhi.sbis.org.br/index.php/jhi-sbis/article/view/1092>

33. Filgueiras TF, Assis AE, Lima RM, Silva BG, Carício MR, Leal AS, et al. Nurses' perceptions of care processes during the COVID-19 pandemic. *Enferm Foco*. 2024;15(Suppl1):e-202416SUPL1. doi:<https://doi.org/10.21675/2357-07X.2024.v15.e-202416SUPL1>

**Statement of responsibility:** Declaramos que todos os autores participaram na construção e elaboração do artigo apresentado. Sendo que:

SANTANA, CCAP - Colaborou na conceitualização, investigação, metodologia, escrita e revisão final;  
TALEB, AC - Colaborou na conceitualização, análise formal, validação e revisão final;  
FERNANDES, JA - Colaborou na investigação, metodologia e revisão final;  
SANTOS, EC - Colaborou na metodologia, validação e revisão final.

**Funding:** Os autores declaram que não houve financiamento para o desenvolvimento da pesquisa que originou este artigo.

**Conflict of interest:** Os autores declaram não haver nenhum conflito de interesse com relação a esta pesquisa, autoria ou publicação deste artigo.

**How to cite this article:** Santana C. C. A. P., Taleb A. C., Fernandes J. A., Santos E. D. C. Telemedicine and Telehealth Center of Goiás: Contribution to tele-education in the Central-West of Brazil. *Latin Am J Telehealth*. *Latin Am J Telehealth*, Belo Horizonte, 2024; 11(1): 077-085 ISSN: 2175-2990.