



Disease management teams in oncology: State of the art and the experience of a scientific institute of hospitalization and treatment (IRCCS) in Rome, Italy

Marialuisa Appetecchia^{a,*}, Carlotta Amantea^b, Marco Canfora^c, Fabrizio Petrone^d, Gennaro Ciliberto^c, Ermete Gallo^e, Laura Figorilli^f

^a Oncological Endocrinology Unit, IRCCS Regina Elena National Cancer Institute, Via Elio Chianesi 53, Rome, 00144, Italy

^b Department of Health Science and Public Health, Università Cattolica del Sacro Cuore, Largo Francesco Vito 1, 00168, Rome, Italy

^c Scientific Direction, IRCCS Regina Elena National Cancer Institute, Via Elio Chianesi 53, Rome, 00144, Rome, Italy

^d Nursing, Technical, Rehabilitation, Assistance and Research Direction, IRCCS Regina Elena National Cancer Institute, Via Elio Chianesi 53, Rome, 00144, Rome, Italy

^e Corporate Health Direction, IRCCS Regina Elena National Cancer Institute, Via Elio Chianesi 53, Rome, 00144, Rome, Italy

^f General Direction, IRCCS Regina Elena National Cancer Institute, Via Elio Chianesi 53, Rome, 00144, Rome, Italy

ARTICLE INFO

Keywords:

Disease management team
Oncological diseases
Healthcare organization

ABSTRACT

Background: This article analyzes the main coordination needs linked to the diagnosis and treatment of oncological diseases, presenting the various integration tools that our healthcare organization adopted to guarantee continuity of care at the IRCCS IFO (Istituto di Ricovero e Cura a Carattere Scientifico Istituti Fisioterapici Ospitalieri) in Rome. The object of investigation is the disease management team (DMT) organization for the diagnosis and treatment of people suffering from oncological disease and the consequences in terms of improving their management.

Methods: The study focuses, in particular, on the analysis of the different organizational methods chosen for the management of activities related to diagnosis and treatment paths.

Results: The results, although preliminary, highlight a great variability in the adoption of integrated organizational models by the different DMTs compatible with the heterogeneity of oncological diseases.

Conclusion: The results of this study have highlighted that, despite the diversity of the different DMTs created for different oncological pathologies, DMTs guarantee a patient-centered approach and the creation of shared databases, which facilitates the evaluation of progress and the identification of areas for improvement. This analysis has allowed us to obtain a useful map of the models used by the different DMTs, also laying the foundations for more precise evaluations of their effectiveness. The correct evaluation of the effectiveness of DMTs acquires great importance today, especially if we consider that empirical evidence is not yet in agreement on the real effectiveness of this tool with respect to both the qualitative dimension and the efficiency of interventions.

1. Introduction

Healthcare today faces an organizational paradox, which requires both differentiation and integration between different services (Scott et al., 2000). The current “healthcare model” presents a high level of professional specialization within healthcare companies (Cosmacini, 1997). Despite this, in strong contrast, in the National Health Service there is a lot of attention to the creation of high-quality services connected to each other from a clinical and organizational point of view.

The interest focuses on the services provided and the care benefits and, above all, on the organizational processes that allow the provision of services. In recent years, researchers, operators, and decision-makers in the healthcare sector have paid close attention to the continuity of care that allows an adequate response in terms of treatment effectiveness, efficiency, and management appropriateness, especially for pathologies in which the adoption of an integrated approach is necessary and multidisciplinary (Lindqvist and Grape, 1999; Secker and Hill, 2001). Differentiation manifests itself through the peculiar

* Corresponding author. Oncological Endocrinology Unit, IRCCS Regina Elena National Cancer Institute, Via Elio Chianesi 53, Rome, 00144, Italy.

E-mail addresses: marialuisa.appetecchia@ifo.it (M. Appetecchia), carlotta.amantea01@icatt.it (C. Amantea), marco.canfora@ifo.it (M. Canfora), fabrizio.petrone@ifo.it (F. Petrone), gennaro.ciliberto@ifo.it (G. Ciliberto), egallo@ospedalesantandrea.it (E. Gallo), laura.figorilli@ifo.it (L. Figorilli).

<https://doi.org/10.1016/j.bbih.2024.100919>

Received 30 July 2024; Received in revised form 25 November 2024; Accepted 1 December 2024

Available online 5 December 2024

2666-3546/© 2024 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

technical-professional specialization of languages, cognitive schemes and values adopted and expressed by doctors and organizational structures. This differentiation favors the progressive focus of the actors around a narrow core of skills and is a source of autonomous and heterogeneous behaviors that represent a potential risk whenever they appear disconnected from the patient's actual care needs. High differentiation is an organizational problem, especially when the intensity of the interdependencies that characterize the activities and skills necessary to respond to the patient's needs appears particularly high. In the absence of integration, strong differentiation gives rise to the phenomena of organizational fragmentation (Lawrence and Lorsch, 1967). In oncological pathologies, personal care requires an intense interconnection between different levels of assistance. Treatment of these diseases requires very strong inter-organizational ties while fueling the need for differentiation and integration (Saltman and Figueras, 1997). The satisfaction of the patient's health needs derives from the action of multiple actors, such as specialists and hospital doctors, who intervene with different roles and skills (medical and surgical oncologist, radiologist, pathologist, dermatologist, urologist, orthopedic, hematologist, endocrinologist, gastroenterologist, gynecologist, neurologist and nuclear medicine specialist, can be included, depending on the characteristics of each DMT). The progressive intensification of organizational complementarities by the various suppliers involved in the service delivery processes generates very high coordination problems (Richardson, 1972). In the field of oncological pathologies, the presence of individual tools (protocols, teamwork, etc.) is not sufficient to guarantee an acceptable result in terms of effectiveness and efficiency, appropriateness, and perceived quality (Leutz, 1999; Axelsson and Axelsson, 2006), given the high interdependence that characterizes the healthcare activity of the various organizational actors. The management of oncological disease requires the use of an appropriate mix of integration tools. As the organization of so complex interactions involving internal and possibly external activities is challenging and is not guided by established methodologies, we propose the satisfactory experience of a large oncological institution, as a possible example.

This work aims to describe the disease management team (DMT) model of our Institute for the diagnosis and treatment of oncological diseases starting from the DMT Regulation. The article presents the IFO (Istituti Fisioterapici Ospitalieri) DMTs as a model of organizational integration. The article concludes with a summary of the results obtained and the presentation of some implications for healthcare professionals and policymakers.

2. Methods

2.1. Analysis methodology

This study analyzes the organizational characteristics of the IFO DMT model and the tools chosen at an institutional level for managing continuity of care. The analysis strategy consists of a qualitative analysis of the oncological DMTs present in the IFOs with the aim of providing a mapping of the organizational solutions adopted considering the presence of important integration tools, such as guidelines and protocols, information systems, and case management figures. The IRCCS IFO is a public law body and includes the following institutes: IRCCS Regina Elena National Cancer Institute for the research, study and treatment of tumors; IRCCS San Gallicano Institute, for the research, study, and treatment of skin diseases, including oncological and professional ones, and sexually transmitted diseases.

The ordinary operating model is distinguished by.

- Global patient care;
- Multi-professional interdisciplinary approach;
- Integration between the clinical area and the basic research area.

The last activity is to be achieved with.

- Clinical care paths ("Clinical Paths – diagnostic, therapeutic, care path [PDTA, percorso diagnostico terapeutico assistenziale]") for the management and temporal planning of all health interventions;
- Multidisciplinary teams (DMTs) for an integrated approach to the various pathologies of competence;
- Translational Research Interest Groups to support translational research and develop efficient ways of transferring biomedical research results into clinical practice.

The IFO established 15 DMTs, as shown in Table 1, and adopted the Regulation of the Multidisciplinary Disease Teams, identifying its objectives, general principles, governance, characteristics of the members, methods of organization and functioning and the reference forms.

2.2. Organization and operation

All DMTs refer to the general Regulation of the Institute preliminarily approved by Strategic Management, which has defined its operating methods. An annual audit is scheduled for quality control. The DMTs meet at least once a week, usually on pre-established days and times, during working hours. The DMT time is considered in the planning of work shifts for all the professionals involved, who are therefore freed from other tasks.

The core management team of the DMT includes the Coordinator, the Case Manager, the Secretary, the relevant specialists. Each DMT has its own composition, which depends on the skills present in the Institute. Additional participants are chosen based on the disease needs and the skills present in the Institute. Fig. 1 shows the workflow of DMTs. The DMT identifies the PDTA for the reference pathology, provides a care plan with diagnostic tests, treatment, support services (for psychology, pain, palliation), level of care and rehabilitation for the patient and evaluates the possible inclusion of the patient in a clinical trial. All cases of the reference PDTA flow to the DMTs. All the cases presented are discussed, based on clinical and scientific evidence, the reference guidelines and the final diagnostic and/or therapeutic recommendation of the DMT is verbalized. The report contains the reference PDTA/DMT, name and role of the specialists present, number of cases presented, a short description of the presented cases, reference guidelines, deviations from guidelines, number of cases included in clinical trials, research studies or proposed to the Molecular Tumor Board for off-label treatments, final decisions. The specialist in charge of the case shares decisions with those concerned, and the Case Manager initiates the patient's management. The DMT offers training sessions to personnel, patients, and volunteers operating in IFO. A bimonthly meeting on the scientific activity of DMT is planned.

A report on the DMT is sent to the Department Director twice/year. A report including the number of meetings, proportion of present patients, proportion of discussed cases per disease, number of new cases, number of deviations from guidelines, proportion of deviations from the reference PDTA, and proportion of patients enrolled in clinical studies or referred to the Molecular Tumor Board is sent to the Strategic Management each year.

A computerized platform has been created for DMTs. This digital tool, represented by a dedicated and in-house realized platform allowing a structured workflow, facilitates clinicians in discussion processes and final decisions. It provides a centralized and personalized dashboard by district/organ. This approach simplifies multidisciplinary teamwork and increases the number of annually discussed clinical cases, maintaining a high level of quality.

3. Results

The resolution approving DMTs use in IRCCS IFO was held in February 2016, and the first PDTA was approved in June 2016. Our analysis included data from the approval of the first PDTA to July 2024. IFO organized 15 DMTs, of whom 13 are for oncological and 2 for

Table 1

The DMTs approved in IRCCS IFO at the time of the analysis.

DMT breast cancer
DMT melanoma
DMT gastro-intestinal and hepato-biliary-pancreatic cancers
DMT gynecological cancers
DMT thoracopulmonary cancers
DMT urological cancers
DMT musculoskeletal neoplasms, sarcomas, and gastrointestinal stromal tumors (GIST)
DMT central nervous system cancers
DMT head and neck cancers
DMT thyroid cancers
DMT hematological neoplasms
DMT non-melanoma skin cancers
DMT psoriasis
DMT neuroendocrine neoplasms
DMT porphyrias

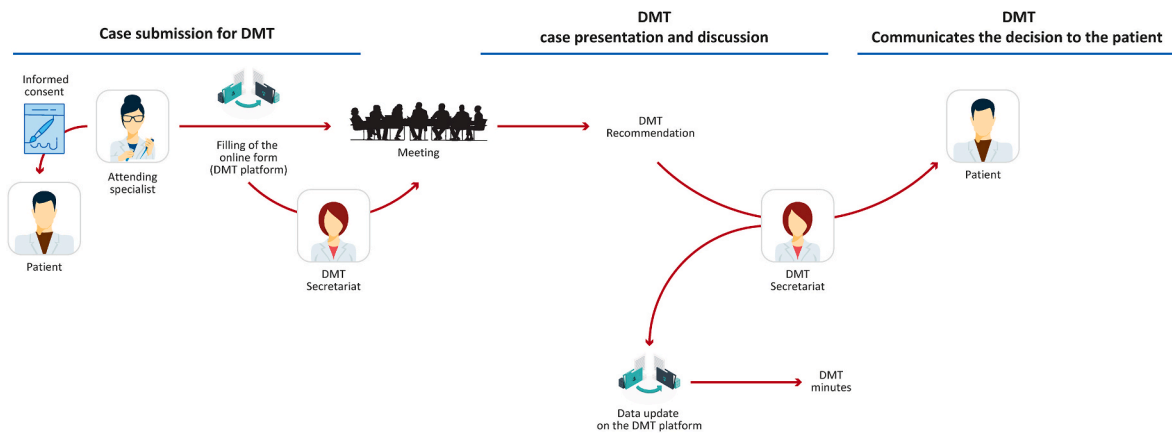


Fig. 1. Workflow of DMTs active in IRCCS IFO.

dermatological diseases and approved 18 PDTAs by the time of this analysis (Table 1). A dedicated Case Manager is present in 5/15 (27%) DMTs.

7/15 (47%) DMTs are operating through a computerized platform created for the management and recording of the cases discussed (Table 2).

Table 2 depicts the currently activated DMTs with patient data case studies available, taking into consideration that the use of each tool has started in different periods (data updated on July 22, 2024).

From the analysis, it emerges that a certain number of meetings are expected to be held in a predefined time frame as part of an organization of the time/work of the specialists participating in the DMT. This seems

Table 2

DMTs activated on the IFO platform at the time of the analysis, with available patient data case studies.

Cancer type/disease oriented DMT	Activation date	NC	RD	T	D
Musculoskeletal tumors, sarcomas, and gastrointestinal stromal tumors (GIST)	March 2023	777	282	2	12
Gynecological cancers	July 2023	604	133	2	23
Hematological malignancies	September 2023	206	153	1	2
Thyroid cancers	October 2023	157	98	73	NA
Neuroendocrine malignancies	February 2024	21	40	5	NA
Head and neck cancers	June 2024	NA	NA	NA	NA
Thoracopulmonary cancers	July 2024	NA	NA	NA	NA

D: cases with deviation from guidelines; NC: newly discussed patient cases; RD: rediscussed patient cases; T: patients enrolled in clinical trials.

in line with the institutional desire to give overall homogeneity to DMTs through specific operational lines. These operational guidelines are defined in the resolution that adopts the Regulation of the DMTs of the IFO indicated above. The fact that the DMTs have overall implemented the indications provided by the Institute Regulation in the composition of their group indicates a good level of overall harmonization of the system.

Beyond these elements of homogeneity in adhering to the issued regulation, DMTs nevertheless present elements of strong dissimilarity, i.e. the presence of a variable number of cases with deviation from guidelines (Table 2).

Indeed, although all DMTs in IFO share the objective of improving assistance in patient care, they are not homogeneous in terms of organization, composition, and contents. The first important element of heterogeneity concerns the process and intermediate outcome indicators. Sometimes, the indicators are omitted, and sometimes, the inclusion of additional indicators is observed. Furthermore, both the period of application of the indicators and the reference standards are different among DMTs. Another element of heterogeneity is the mix of organizational tools adopted. IFO DMTs include the following tools for coordination.

- Production of diagnostic-therapeutic protocols shared by all professionals and interested parties taken from international and national guidelines;
- Careful definition of the activities, tasks, and skills of specialists;
- Coordinated management of the system through the recording of all clinical data relating to each patient in a shared, networked information system;

- Creation of advanced coordination models linked to the creation of highly integrated task forces of professionals.

The presence of one or more tools, together with their different combination in each plan, allows the comparison of organizational choices for DMT between different pathologies. The analysis highlights that all plans envisage the use of integration tools, such as protocols and guidelines based on scientific evidence, but the use of information systems, professional task forces and dedicated integrator roles is heterogeneous.

Data analyses originated by the DMT platform, by providing real-time updated data per cancer type, can support the Institute's strategic management work in the decision-making process, planning of research lines to be implemented or identification of most promising research opportunities, evaluation and/or monitoring effort also by external stakeholders including governmental or non-governmental organization (i.e., OEI, Organisation of European Cancer Institutes) as well as positively impact on potential public or private bodies interested in research collaboration.

4. Discussion

This article analyzes the outcomes and adherence to the designed organization of the 15 DMTs active in IFO, and started in different periods. Available data show that meetings of specialists participating in each DMT are held in predefined time frames, implementing the indications provided by the Institute Regulation. As a result, the system has a good overall harmonization, which is one of its main aims, although dissimilarity exists in DMTs, due to disease particularities. Different indicators, reference standards, and organizational tools are used among DMTs.

The epidemiological characteristics of the population and the prevalence rates of some oncological pathologies make the problem of integration and organizational coordination particularly relevant in our country. As of January 1, 2023, data from the Italian Statistics Institute (ISTAT, 2023) shows that in Italy, there are 14 million and 177,000 people over 65 years of age, 24.1% (almost a quarter) of the total population, estimating a massive increase in this percentage that is expected to be around 35% in 2050 [Siegel et al., 2023; International Agency for Research on Cancer; Sung et al., 2021]. The situation is particularly alarming if we consider that every year in Italy, oncological diseases cause 87,690 hospitalizations. The adoption of an effective "management" of oncological pathologies requires the composition of highly interdependent activities carried out by multiple autonomous subjects within different healthcare and sectoral levels. The ability to give an adequate response to a specific category of patients requires coordination between the activities carried out by these subjects with the aim of offering a range of integrated services (prevention, diagnosis and treatment, rehabilitation, and care). An interesting model that classifies integration interventions is the one proposed by Axelsson and Axelsson (2006), which distinguishes horizontal and vertical integration models. Vertical integration involves organizations or organizational units that are on different levels of the hierarchical ladder, while horizontal integration refers to organizations placed on the same hierarchical level and having the same status. The two authors develop three main models for the integration of inter-organizational activities: coordination, cooperation, and collaboration. Coordination places particular emphasis on vertical integration, using typical forms of hierarchical integration such as hierarchical control, authority, and supervision of activities. Cooperation uses hierarchical forms of coordination, although there is still room for the creation of spontaneous and voluntary relationships between organizations. Collaboration mainly involves the creation of lateral relationships based on trust and mutual adaptation between autonomous subjects. In the case of oncological diseases, the focus is mainly based on models of horizontal integration of autonomous subjects often belonging to different levels and/or healthcare sectors

(Axelsson and Axelsson, 2006; Jakobsson et al., 2002; Hultberg et al., 2003), which use guidelines, information systems for information sharing and multidisciplinary teams (Jakobsson et al., 2002; Charns and Schaefer, 1983; Campbell et al., 1998; Øvretveit, 1993; Øvretveit J et al., 1997; van Raak et al., 2003), to increase information and knowledge sharing.

The use of information and support systems, allowing easy and rapid access to data useful for carrying out interventions in a logic of continuity of care, guarantees the sharing of codified information between professionals (Hippisley-Cox et al., 2003). Where the interdependencies between organizational actors become particularly rich and complex, it is necessary to resort to more effective but also more expensive tools in terms of dedicated human resources, such as integrative roles and case management figures (Bower, 1998). Teamwork responds to particular needs, linked to the tacit nature of knowledge and the strong uncertainty that can characterize very complex phases of the care process (Sparrowe et al., 2001; Cicchetti, 2004; ASSR, 1996). The Italian Health Service is among the few at the European level to have maintained a universalistic footprint. The variability of clinical outcomes depends only in part on the level of "innovativeness" of the available drugs or the more or less massive presence of surgical robots. The "human factor" is fundamental but no longer sufficient to obtain the best results in treatment. Today, treating a patient requires the skills of multiple professionals, each with less extensive but more in-depth training in their specialty. Furthermore, the need emerges for a new professional figure who develops three skills: the ability to evaluate and measure critical phenomena (errors, waste, etc.), the search for solutions to the problems faced every day by management and the ability to implement solutions through teamwork. Fulop et al. (Fulop and Ramsay, 2019) have demonstrated how working together in a multidisciplinary way can improve the quality of care. In Italy, "network" work, especially in the oncology field, is spreading rapidly, although, unfortunately, patchy, in relation to pathological areas.

In Italy, thanks to Ministerial Decree 70 of 2015, the Regions have launched important efforts to create clinical networks and PDTAs, which in some way "push" to work in an integrated and multidisciplinary way in all areas of oncology (Cicchetti, 2018) to create DMTs in different medical diseases (Cropper et al., 2002; Fleissig et al., 2006) with the objective of sharing knowledge on the case to outline the best and most suitable therapy (www.cancer.net). Scientific evidence is a central catalyst for cooperation between professionals and adherence to a decision-making process. The DMT, therefore, is based on a shared cultural superiority of the "systemic" approach to care management compared to the more traditional decision-making model centered on the "science and conscience" of the individual professional. It is widely demonstrated that the implementation of multidisciplinary teams in oncology has positive effects on increasing survival (Fennell et al., 2010; Croke and El-Sayed, 2012; Taylor et al., 2010; Prades et al., 2015; Prades and Borràs, 2010). However, to reach a complete characterization of multidisciplinary and effective integrated management, the availability of data and information must also be considered. When the case is discussed in a DMT, all the clinical data and evidence useful for the best resolution of the case must be made available and useable at a specific time and in that specific place (physical or virtual). The digitalization of information and the potential of artificial intelligence, therefore, appear to be essential prospects for adequate teamwork. The integrated management must be carried out in full sharing with the patient, who must be able to make an informed decision on the treatment path. The methods of communication and sharing with patients and their caregivers must represent the distinctive feature of the action of a good DMT. The elements of an effective team are.

- The correct identification of team members, the presence of adequate skills, involvement, and motivation;

- The availability of physical infrastructure for meetings and an adequate technological platform for remote meetings and the exchange of data and information;
- A clear organization of meeting logistics, planning and preparation of meetings, management of post-meeting activities (e.g., booking services and services);
- The definition of a patient-centered clinical decision-making process;
- Team governance, data collection, analysis, and audit.

DMT is an innovative and proactive approach to oncological diseases, allowing interventions aimed at optimizing outcomes, based on evidence-based models and measure of outcome levels (Bodenheimer, 2000). The objective is to limit damage to health by improving expectations and/or quality of life through greater economic efficiency of prevention, diagnosis, and treatment. The effectiveness of a DMT model is linked – according to the indications of the Disease Management American Association – to the implementation of some important organizational elements (DMAA, 2002): the use of protocols based on scientific evidence to optimize therapies; the planning of healthcare activities aimed at promoting the evaluation and governance of processes and outcomes; the appropriate use of information systems; a multidisciplinary and proactive approach of professionals towards the patient; patient empowerment actions. This highlights the complexity of DMT as a holistic approach.

DMT platform could be considered an additional tool and mechanism for supporting the review of the quality of professional care, can pursue the uniformity of standard of care for cancer patients, can improve the decision-making process based on case review and discussion of treatment options, and can help specialists improve workflow. Oncological diseases are a reference model for DMTs among chronic pathologies, as they are suitable for a defined diagnostic-therapeutic path and can be effectively evaluated through a set of indicators to measure the quality of the services provided. Indeed, the Italian Ministry of Health, in agreement with the Italian Regions and Autonomous Provinces (b), has prepared a national active prevention plan (2020–2025) which envisages DMT as an institutional model for the management and integrated prevention of oncological diseases.

The DMTs have adhered to the internal regulation based on the general definition of DMT (regular meetings of participants, presence of multiple professional roles, sharing of clinical information, and the objective of defining the best management and care path for the individual patient), but they have been heterogeneous in the use of organizational tools, in the standardization of the path through guidelines and diagnostic-therapeutic protocols, in the use of integrated information systems, in the adoption of case management and multiprofessional teams. These differences reflect the needs of pathologies cared for by the DMTs, which are mainly but not exclusively oncological and differ in epidemiology, prognosis, treatments, and supportive care. Overall, the analysis shows that the use of several integration tools allows a patient-centered approach, making available and understandable to all actors the information on the therapeutic path and providing communication channels for care teams, patients, and caregivers.

5. Conclusions

Healthcare activities necessary to the treatment of oncological diseases are characterized by great organizational differentiation. The ability to guarantee effective, timely and adequate services requires the involvement of a variety of highly specialized subjects and, at the same time, the use of a great variety of resources, technologies, and knowledge. DMT is of particular importance as it is considered an ideal tool to ensure continuity of care for patients through a mix of mechanisms. The analysis of the performance of this activity highlighted the diversity of the different DMTs created for the various oncological pathologies, with particular regard to the standardization of the paths through guidelines and diagnostic-therapeutic protocols, the use of integrated information

systems, the adoption of case management and multi-professional teams. This is in accordance with the substantial differences existing between the different oncological pathologies in terms of epidemiology, prognosis, treatments, etc. The results highlight, however, how integration models allow a patient-centered approach, with available and understandable information on the therapeutic path and clear communication channels between care teams, patients, and families. They also allow the creation of shared databases recording decisions, results, and clinical indicators, facilitating the evaluation of progress and the identification of areas for improvement in accordance with what is indicated by EPAAC (European Partnership for Action against Cancer). Our analysis provided a map of the models used by the different DMTs, also laying the foundations for more precise assessments of their effectiveness. It is important to highlight that this analysis is based on organizational design solutions; the Regulation, in fact, allows the design and strategic intentions relating to the integration programs to be verified, but not the actual implementation of the DMT actions. It should be underlined that multidisciplinary management does not imply the need for larger resources but rather a reorganization of the resources already available. Observing the implementation of coordination tools in the various oncological pathologies would allow us to support a useful verification of the degree of adherence between interventions designed ‘on paper’ and actually functioning programs. DMT model/approach can contribute to address critical issues, such as costs, legal responsibility, geographic barriers, and treatment delays (Berardi et al., 2020), by providing a software platform and ultimately supporting new computational analysis methods.

Overall, these considerations demonstrate that DMT organizations offer benefits to patients, physicians, the community, and hospitals, resulting in an efficient management model for oncologic disease treatment within the Italian national healthcare system. Finally, it seems appropriate to underline that the correct evaluation of the effectiveness of DMTs acquires great importance today, especially if we consider that the empirical evidence is not yet in agreement on the real effectiveness of this tool with respect to both the qualitative and efficiency dimensions of the interventions.

CRediT authorship contribution statement

Marialuisa Appetecchia: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **Carlotta Amantea:** Writing – review & editing. **Marco Canfora:** Writing – review & editing, Formal analysis. **Fabrizio Petrone:** Writing – review & editing. **Gennaro Ciliberto:** Writing – review & editing, Methodology. **Ermete Gallo:** Writing – review & editing. **Laura Figorilli:** Writing – review & editing.

Ethics approval

N/A.

Funding

This work was financially supported through funding from the institutional "Ricerca Corrente" granted by the Italian Ministry of Health.

Declaration of competing interest

There is no conflict of interest among all authors.

Acknowledgements

Editorial assistance was provided by Ashni Shah and Valentina Attanasio (Polistudium srl, Milan, Italy)

Data availability

Data will be made available on request.

References

- ASSR, 1996. The Department in the National Health Service; proposal of guidelines for the application of the departmental model in hospital structures. Report of the working group on Departments. Rome, 30 January.
- Axelsson, R., Axelsson, S.B., 2006. Integration and collaboration in public health: a conceptual framework. *Int J Health Plann Manage* 21, 75–88.
- Berardi, R., Morgese, F., Rinaldi, S., Torniai, M., Mentraati, G., Scortichini, L., Giampieri, R., 2020. Benefits and limitations of a multidisciplinary approach in cancer patient management. *Cancer Manag. Res.* 12, 9363–9374.
- Bodenheimer, T., 2000. Disease management in the American market. *BMJ* 320, 563–566.
- Bower, K.A., 1998. Clinically integrated delivery systems and case management. In: Tonges M (a cura di), *Clinical integration*. Jossey Bass Publishers, San Francisco, pp. 179–198.
- Campbell, H., Hotchkiss, R., Bradshaw, N., Porteous, M., 1998. Integrated care pathways. *BMJ* 316, 133–137.
- Charns, M., Schaefer, M., 1983. *Health Care Organizations, a Model for Management*. Prentice Hall, Upper Saddle River, NJ.
- Cicchetti, A., 2004. *La Progettazione Organizzativa*, Milano, Franco Angeli.
- Cicchetti, A., 2018. L'Organizzazione, la migliore medicina. In: *X Rapporto condizione assistenziale dei malati oncologici*. FAVO, Roma.
- Cosmacini, G., 1997. *L'arte Lunga*. Edizioni Laterza, Bari. ISBN: 9788842095460.
- Croke, J.M., El-Sayed, S., 2012. Multidisciplinary management of cancer patients: chasing a shadow or real value? An overview of the literature. *Curr. Oncol.* 19, e232–e238.
- Cropper, S., Hopper, A., Spencer, S.A., 2002. Managed clinical networks. *Arch. Dis. Child.* 87, 1–4.
- DMAA, 2002. *Disease management: findings from leading state programs. state coverage initiatives*. Available online at: <http://www.dmaa.org/pdf/DMSStatePrograms.pdf> [last consulted February 2008].
- Fennell, M.L., Das, I.P., Clauser, S., Petrelli, N., Salner, A., 2010. The organization of multidisciplinary care teams: modeling internal and external influences on cancer care quality. *J. Natl. Cancer Inst. Monogr.* 2010, 72–80.
- Fleissig, A., Jenkins, V., Catt, S., Fallowfield, L., 2006. Multidisciplinary teams in cancer care: are they effective in the UK? *Lancet Oncol.* 7, 935–943.
- Fulop, N.J., Ramsay, A.I.G., 2019. How organisations contribute to improving the quality of healthcare. *BMJ* 365, 11773.
- Hippisley-Cox, J., Pringle, M., Cater, R., Wynn, A., Hammersley, V., Coupland, C., Hapgood, R., Horsfield, P., Teasdale, S., Johnson, C., 2003. The electronic patient record in primary care—regression or progression? A cross sectional study. *BMJ* 326, 1439–1443.
- Hultberg, E.L., Lönnroth, K., Allebeck, P., 2003. Co-financing as a means to improve collaboration between primary health care, social insurance and social service in Sweden: a qualitative study of collaboration experiences among rehabilitation partners. *Health Pol.* 64, 143–152.
- International Agency for Research on Cancer, Population Factsheet. <https://gco.iarc.fr/today/en/fact-sheets-populations>.
- ISTAT. Annual report 2023 – the state of the nation. 31st edition. Available at: <https://www.istat.it/storage/rapporto-annuale/2023/Rapporto-Annuale-2023.pdf>. Accessed July 5th 2024.
- Jakobsson, B., Schüldt, H.U., Bergroth, A., Selander, J., Ekholm, J., 2002. Improved cooperation in vocational rehabilitation with systemic rehabilitation group meetings. *Disabil. Rehabil.* 24, 734–740.
- Lawrence, P., Lorsch, J., 1967. *Organization and environment*, Boston, Harvard Business School. <https://www.hbs.edu/faculty/Pages/item.aspx?num=7917>. (Accessed 8 July 2024).
- Leutz, W.N., 1999. Five laws for integrating medical and social services: lessons from the United States and the United Kingdom. *Milbank Q.* 77, 77–110.
- Lindqvist, R., Grape, O., 1999. Vocational rehabilitation of the socially disadvantaged long-term sick: inter-organizational co-operation between welfare state agencies. *Scand J Public Health* 1, 5–10.
- Øvretveit, J., 1993. *Coordinating Community Care: Multidisciplinary Teams and Care Management*. Open University Press, Buckingham (Philadelphia).
- Øvretveit, J., 1997. How patient power and client participation affects relations between professions. In: Øvretveit, J., Mathias, P., Thompson, T. (Eds.), *Interprofessional Working for Health and Social Care*. Palgrave MacMillan, Basingstoke a cura di).
- Prades, J., Borràs, J.M., 2010. La priorització de fàrmacs oncològics en el sistema hospitalari de Catalunya: estudio cualitativo de casos [Prioritization of chemotherapy drugs in the Catalan hospital system: a qualitative case study]. *Gac. Sanit.* 24, 416–422. Spanish.
- Prades, J., Remue, E., van Hoof, E., Borràs, J.M., 2015. Is it worth reorganising cancer services on the basis of multidisciplinary teams (MDTs)? A systematic review of the objectives and organisation of MDTs and their impact on patient outcomes. *Health Pol.* 119, 464–474.
- Richardson, G.B., 1972. The organization of industry. *Econ. J.* 82, 833–896.
- Saltman, R.B., Figueras, J., 1997. *European Health Care Reform: Analysis of Current Strategies*. WHO Regional Publication, Geneva.
- Scott, W.R., Ruef, M., Mendel, P.J., Caronna, C.A., 2000. *Institutional Change and Healthcare Organizations*. University of Chicago Press, Chicago.
- Secker, J., Hill, K., 2001. Broadening the partnerships: experiences of working across community agencies. *J. Interprof. Care* 15, 341–350.
- Siegel, R.L., Miller, K.D., Wagle, N.S., Jemal, A., 2023. *Cancer statistics, 2023*. *CA Cancer J Clin* 73, 17–48.
- Sparrowe, R.T., Liden, R.C., Wayne, S.T., Kraimer, M.L., 2001. Social networks and the performance of individuals and groups. *Acad Manage J* 44, 316–325.
- Sung, H., Ferlay, J., Siegel, R.L., Laversanne, M., Soerjomataram, I., Jemal, A., Bray, F., 2021. *Global Cancer Statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries*. *CA Cancer J Clin* 71, 209–249.
- Taylor, C., Munro, A.J., Glynne-Jones, R., Griffith, C., Trevatt, P., Richards, M., Ramirez, A.J., 2010. Multidisciplinary team working in cancer: what is the evidence? *BMJ* 340, c951.
- van Raak, A., Mur-Veeman, I., Hardy, B., Steenbergen, M., Paulus, A., 2003. *Integrated Care in Europe: Description and Comparison of Integrated Care in Six EU Countries*. Elsevier, Maarsse.
- www.cancer.net.

Glossary

DMT: disease management team

PDTA: diagnostic, therapeutic, care path (*percorso diagnostico terapeutico assistenziale*)