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Understanding the activity of oncology nurse coordinators: An elaboration of a framework based on an abductive approach

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ABSTRACT

Care coordination is a major health system issue, in particular for cancer patients where a lack of coordination may impact quality of care, lived experiences, and care costs. Consequently, new roles facilitating Patient Pathway Coordination (PPC) have been created (nurse coordinators, NC). However, despite their importance, core PPC activities remain unclear. Practices are often heterogeneous and may be far removed from coordination roles, thus posing issues for implementation of PPC policies.

To address this, we generated an analytical framework to investigate the Activity of Patient Pathway Nurse Coordinators in Oncology (APANCO) from an organizational perspective. We adopted an abductive approach, characterized by two phases: the first involved a preliminary theoretical framework confronted with empirical data from two ethnographic fieldwork scenarios. In the second, we confronted the updated framework with data from a care coordination literature review.

The final APANCO framework comprised three main categories at micro-level and three at meso-level. The first categories were used to analyze real NC activity at the micro-level and accounted for activities related (or not) to PPC. Meso-level categories considered organizational contexts that might have influenced NC work content.

APANCO provided invaluable information on NCs activities. The framework may be used for clinical and managerial skills training and for standardizing job descriptions. These elements are key for decision-makers and managers who implement PPC programs.

1. Introduction

Improving care coordination between professionals, patients, and their families, throughout the healthcare pathway, is a major challenge for healthcare systems, particularly for chronic disease management [1, 2]. Within the development of ambulatory care and labor division complexity along the patient pathway, better care coordination has been shown to promote patient pathway quality and efficiency [3].

Cancer patients are particularly affected by coordination requirements, especially during transition between ambulatory and inpatient care [4]. Limited coordination is associated with medical errors, poor remedial toxicity and side effect control from chemotherapy,

poor compliance, and high costs [5]. Importantly, significant numbers of such complications occur during transition from hospital to home care [6].

Faced with an increased incidence of cancer and cancer survivors [7], and in response to coordination requirements, several countries initiated national plans prioritizing and improving Patient Pathway Coordination (PPC) [5]. As part of these plans, a major action initiative has been to create PPC roles [8,9]. These roles initially emerged in the United States of America in the late 1980s, then in several European countries to cover oncology and other clinical specialties [10,11]. PPC roles are generally occupied by nurses [12] who are often called nurse coordinators, pivot nurses, liaison nurses, or coordination support

Abbreviations: APANCO, Activity of Patient Pathway Nurse Coordinators in Oncology; HCO, HealthCare Organizations; NC, Nurse Coordinators; PPC, Patient Pathway Coordination.

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nurses [13]. For simplicity, we used the “NC” acronym throughout this article. NCs have demonstrated their inherent value; they better manage resources, handle medical errors, manage and prevent unnecessary hospitalization, and overall, improve patient experiences [14–16].

However, as initiatives increase, little consensus exists on the precise activity of NCs. Nurse activity should reflect a set of practices involving care coordination between health professionals, patients, and their families during in-patient and ambulatory care. However, practices are often heterogeneous, with deviations occurring when activities have little to do with PPC [13]. Therefore, a better understanding of these activities is a shared challenge for decision-makers and institutional health-policy makers. A framework analyzing NC activities could help managers and decision-makers standardize practices, as recommended by the European Department of the Rand Corporation [17].

Our objective was to formulate a descriptive framework to analyze the real Activity of Patient Pathway Nurse Coordinators in Oncology (APANCO) and focus on content coordination using an organizational approach. Definitions from key agencies have helped clarify care coordination concepts. The Agency for Healthcare Research and Quality proposed: “Care coordination is the deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient’s care to facilitate the appropriate delivery of health care services. Organizing care involves the marshaling of personnel and other resources needed to carry out all required patient care activities and is often managed by the exchange of information among participants responsible for different aspects of care” [18]. As such, for this study we defined PPC as a collective activity between NCs, other professionals (medical, paramedical, or social), and cancer patients or their families. This collective activity involved sharing patient-related information (e.g. clinical, psychosocial, and service information) between pathway actors, regardless of their location (ambulatory/hospital), to ensure a smooth and continuous pathway.

Different care coordination oncology models have been proposed [5, 14], distinguishing care coordination from integration [19], continuity [20], collaboration [21] or cooperation concepts [14]. These models generally identify three analytical levels [22,23]: (i) macro-level accounts for how public policies and financing and regulation modes influences coordination strategies developed at other levels [2,24]; (ii) meso-level models account for organizational design and the institutional adoption of coordination mechanisms within the organization (e.g., designing process flows, protocols or job descriptions, and multidisciplinary care meetings) [25,26]; and (iii) micro-level models describe the activities and practices of front-line actors involved in patient care pathways [27]. While the first two levels have been widely reported, the micro-level remains unclear [28]. A recent French initiative [27] sought to differentiate “activities (practices), actors, tools, and effects” in care coordination. The model provided a set of useful tools for care coordination-program operationalization. Therefore, to advance our knowledge in this area, NC activities should be investigated as they are performed in real time work situations. Additionally, to improve the implementation of these roles, it is important to analyze NC activity in an organizational work context, i.e., we must consider not only the micro-level where activities are performed, but also the meso-level where work organization strategies are adopted.

Within this context, we developed a framework to analyze the activity of NCs in oncology and to capture their real activity in an organizational environment. Such framework development is two-fold. At a theoretical level, it complements existing knowledge on care coordination by enriching experiences at the micro-level and framing them within organizational strategies at the meso-level. In this analysis, coordination is viewed as a core concept of management science, which includes organizational perspective in our framework. From an operational standpoint, the APANCO framework helps managers and decision-makers develop oncology NC roles and evaluate their activities, while strictly focusing on PPC activities.

2. Methodology

We adopted an abductive approach [29,30] where “research issues and the analytical framework are successively reoriented when they are confronted with the empirical world” [31,32]. This method was appropriate because: (1) coordination activity analysis cannot be dissociated from an organizational context [33], (2) the abductive approach permits the creation of new concepts [34], and (3) the abductive approach facilitates the development of a framework which captures real NC activity thanks to confrontation between empirical and theoretical data.

Therefore, our abductive approach was characterized by two phases where we related empirical with theoretical data (Fig. 1).

2.1. First study phase

The first phase involved constructing a preliminary conceptual framework [31], and its confrontation with an empirical analysis based on an ethnographic methodology. This confrontation allowed the initial framework to evolve [31,35].

2.1.1. Development of a preliminary conceptual framework

We started by defining a preliminary theoretical framework [30,31] based on the experience and management science knowledge of the study researchers (EM and MW). This framework was “a tight and evolving framework” [31] and meant it defined several concepts to structure the field, but simultaneously provided enough flexibility for its expansion and adaptation in the field. From this, three concepts were defined: (1) design/implementation coordination activities; (2) internal/external coordination activities; and (3) professional/patient coordination.

2.1.2. Empirical fieldwork in two healthcare organizations (HCOs)

To conduct empirical fieldwork, data were collected according to qualitative ethnographic study principles [33,36] at two HCOs specializing in oncology. HCOs were selected using several criteria [33] to observe and characterize different NC roles (Table 1). Observed NCs belonged to in-/out-patient wards or centralized structures (these structures are coordination platforms outside in-patient wards, but part of HCO work organizations).

Data were collected by a researcher (MXA) at HCO1 and HCO2 for 1 and 3 months, respectively. Observations were conducted by shadowing [36] and timing activities based on time-motion studies principles [37]. We observed one NC at HCO1 and five at HCO2 (20 and 129.5 observation hours at HCO1 and HCO2, respectively). Shadowing was composed of: (i) observing, describing, and timing NC activities, (ii) describing NC perceptions of their activities, and (iii) identifying different actors liaising with NCs and describing their relationships. Detailed notes on activity and objective content were taken. Often, to clarify activity objectives, questions were posed during observations. In parallel, the researcher conducted eight exploratory interviews: five at HCO1 (one each with the NC, healthcare director, the healthcare manager of the gynecology department, and two registered nurses), and three at HCO2 (one each with the healthcare manager, the secretary of the centralized structure, and a NC). To ensure participant anonymity, observations and interviews were sequentially numbered at each site using the NC acronym. Our research was based on human and social sciences methods and does not require institutional review board authorization in France [38,39]. Finally, secondary data sources were collected (reports, prescriptions, archival records, and job descriptions).

For data analysis, we used thematic analyses. Observation data were analyzed based on three concepts of a preliminary framework. First, the study authors individually conducted data coding exercises in Excel spreadsheets (one Excel sheet/concept) using preliminary framework items as a grid. Afterwards, points of contention were discussed at meetings. This approach: (1) confirmed initial framework concepts

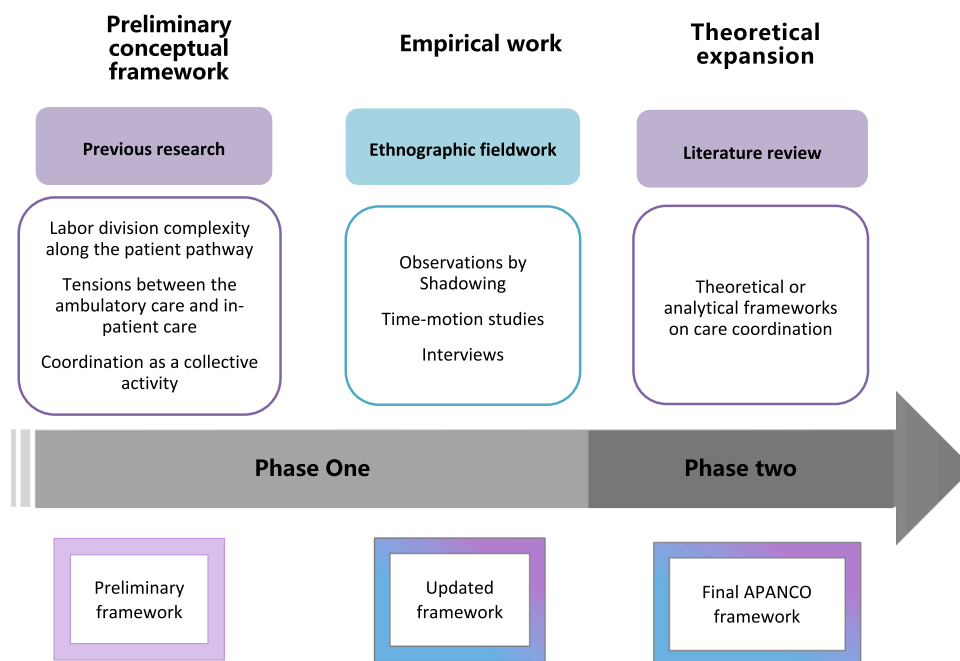


Fig. 1. Phases in developing the APANCO* framework.

*APANCO: Activities of the Patient Pathway Nurse Coordinators in Oncology.

where empirical data helped develop concepts as analysis categories by enriching definitions, or (2) created new categories where empirical data were used to define these categories. Interviews were exploratory, partially transcribed, and were used in combination with secondary data sources as contextual information to consider contingency elements [33].

Confrontation between the preliminary framework and empirical data created a “need” [31] to expand our framework. To understand real, contextual NC activity, it was not only necessary to capture micro-level insights, but also integrate the analysis of organizational strategies where these roles were developed.

2.2. Second study phase

The second phase commenced with an updated framework, addressing questions from the first phase, and was followed by a theoretical analysis based on a literature review. This second confrontation led to the final APANCO framework.

To define the final framework, we conducted a narrative literature review. This type of review is adapted to concept analysis, i.e., care coordination is not a very structured concept and it has been addressed by different disciplines in the literature (e.g., medicine, health service research, nursing science, and management science, amongst others). In addition, our objectives were qualitative in nature; we wanted to create the most comprehensive framework and integrate different facets relating to coordination activities; importantly, they were not quantitative as for scoping reviews. Our objective was to review all theoretical care coordination frameworks and distinguish between macro- (health system), meso- (institutional), and micro-levels (coordination activity). We comprehensively sought all references on the subject, irrespective if activities were performed by a PPC role or within oncology.

In April 2019, for data collection, we queried four databases (PubMed, Scopus, Web of Science, and ScienceDirect) using Preferred Reporting Items for Systematic Reviews and Meta-Analyses principles [40]. Searches were performed using the following keyword combinations: (1) (“Care Coordination” OR “Coordination of Care”) AND (2) (Management OR Organization), AND (3) (Theoretical Framework OR Theoretical Analysis). We limited our search to articles in English,

French, and Spanish (the latter languages required an English abstract for keyword research), without time limits. A manual review of bibliographies using the snowball effect [41,42] completed article selection.

Titles, abstracts, and articles were reviewed (MXA). At each stage, selections were made according to the following inclusion criteria: (i) the full text was available; (ii) the title or abstract included: “care coordination” or “coordination of care” or “care management”; and (iii) the summary defined care coordination or theoretical elements related to categories from our updated framework. Articles and abstracts were excluded if: (i) no definition or theoretical coordination framework was present and (ii) only a “care model” or “care plan” was evaluated. Disagreements over abstract and article inclusion/exclusion were jointly resolved.

We processed articles as follows: (1) we analyzed the literature in relation to updated framework categories. In this instance, literature review confirmed (possibly enriching the content) or invalidated updated framework categories or (2) we enriched the updated framework by integrating new categories.

In total, 891 articles were identified, with 25 ultimately selected (Fig. 2).

3. Results

The results are presented, based on two phases, leading to the final APANCO framework.

3.1. First phase

3.1.1. From a preliminary conceptual framework to fieldwork analysis

Based on our previous experience/research [4,21], we defined three concepts relating to coordination activities:

- (1) *Design coordination versus implementation coordination*: From this concept, we explored the distinction between “coordination conducted during the development and updating of diagnostic and therapeutic patient strategies” (**design coordination**) and “acts related to diagnostic and therapeutic patient strategies” (**implementation coordination**) [21].

Table 1
General characteristics of two oncology HealthCare Organizations (HCO1 and HCO2).

	Not-for-profit hospital (HCO1)	Public university establishment with a reference center in oncology (HCO2)	
Numbers			
Number of beds	140	59	
Day-patient places	8425	1843	
Days of care	6693	753	
H ¹	5.2	10.3	
Days of care DH ²			
Average length of stay			
Link to	Gynecology Department	Centralized structure	In/out-patient wards
Hierarchical chain	Gynecology ward nurse manager	Centralized structure ward nurse manager	Ward nurse manager
Mission	Ensuring hospital-to-home transitions and home follow-up for breast cancer patients	Supporting and coordinating patients care across the entire care pathway	Ensuring hospital-home-transition or transfer to another HCO. Ensuring patient care coordination in the hospital
Role design	Professional design (between the nurse and the surgeon)	Institutional design	
Human resources	One coordination support nurse	Five pivot nurses One secretary	Two liaison nurses Two coordinating nurses Secretaries
Other available resources	None	Coordination software (not connected to the hospital software) Premises	
Observed NC role	One coordination support nurse	Three pivots nurses	One liaison nurse One coordinating nurse

¹ H: Hospitalization

² DH: Day Hospitalization

(2) *Internal coordination versus external coordination:* We differentiated coordination activities which facilitated patient care in HCOs (**internal coordination**) and coordination activities ensuring a transition between HCOs and primary care (**external coordination**).

(3) *NC - professional coordination versus NC - patient coordination:* We distinguished coordination activities by healthcare professionals and NCs, and coordination activities by NCs and patients.

3.1.2. Enriching preliminary concepts and developing the first analysis category

Empirical fieldwork analysis, via the framework prism, confirmed concept relevance and helped us group concepts into the first category: coordination activity.

- 1 Design and implementation coordination. Coordination activities are related to not only diagnostic and therapeutic strategies for patients, but also services and supports.
- 2 Internal coordination versus external coordination. Coordination activities extending beyond the transition between primary care and the HCO.
- 3 NC – professional coordination versus NC – patient coordination. Different relational forms were favored depending on the NC.

3.1.3. New categories from empirical fieldwork

Empirical fieldwork analysis generated new categories not previously addressed by the preliminary framework.

Activities supporting coordination: Many tasks purported to improve care coordination but did not directly improve continuity in patient pathways, e.g.:

- Systematically sending letters to attending physicians announcing NC contact information for patient pathways. Many doctors do not respond to such letters.
- Supporting actions reducing the administrative burden on medical professionals, e.g., filling out hospitalization files. These support actions allowed coordination activities be conducted in a timely manner.
- Work support and verification actions, e.g., most NC activities in HCO2 were characterized by: (1) checking medical consultation reports before chemotherapy and producing summaries to help nurses on wards and (2) scheduling chemotherapy sessions, patient visits to the day hospital, and managing time slots. These activities did not directly influence patient pathway fluidity but were necessary for its smooth running.

Non-coordination activities: NCs did not just coordinate but often performed adjustment roles in departments; they supported departmental management, e.g., quality monitoring.

Our preliminary framework, after confrontation with empirical fieldwork, defined three main categories: (1) **Coordination activity**, (2) **Activities supporting coordination**, and (3) **Non-coordination activities**. Coordination activity comprised three sub-categories: (1.1) Design coordination versus implementation coordination, (1.2) Internal coordination versus external coordination, and (1.3) NC – professional coordination versus NC – patient coordination. Additionally, empirical data analysis encouraged us to formalize interactions between NCs coordination activities and organizational strategies (meso-level). For example, fieldwork showed that some organizational mechanisms, such as the degree of formalization of coordination programs, may influence the type of coordination performed by these roles. Likewise, the presence or absence of ward nurse managers at NC workplaces impacted the time dedicated to coordination activities. Therefore, we referred to our literature review to understand how organizational strategies impacted PPC activities by NCs.

3.2. Second phase: from empirical fieldwork analysis to theoretical knowledge

As described, to better integrate organizational strategies into our analytical framework, we conducted a literature review, which allowed us to comprehensively explore updated framework categories and identify three new categories. Therefore, the final APANCO framework was composed of three main micro- and three meso-level categories (Fig. 3).

3.2.1. Enriching existing categories

Coordination activities are related to patient diagnostic and therapeutic strategies, and also psycho-social support and services activities. Our observations showed that different coordination activities coexisted, e.g., coordinating clinical actions, psychosocial assistance actions, or personal services. Hannigan et al. [43] and Gardner et al. [22] confirmed our observations by describing coordination activities as clinical actions, but in particular, those related to patient assistance, support, and navigation through the health system. Therefore, we defined three activity types:

- Clinical coordination activities are linked to actions performed during the development, updating, and implementation of diagnostic and therapeutic strategies.

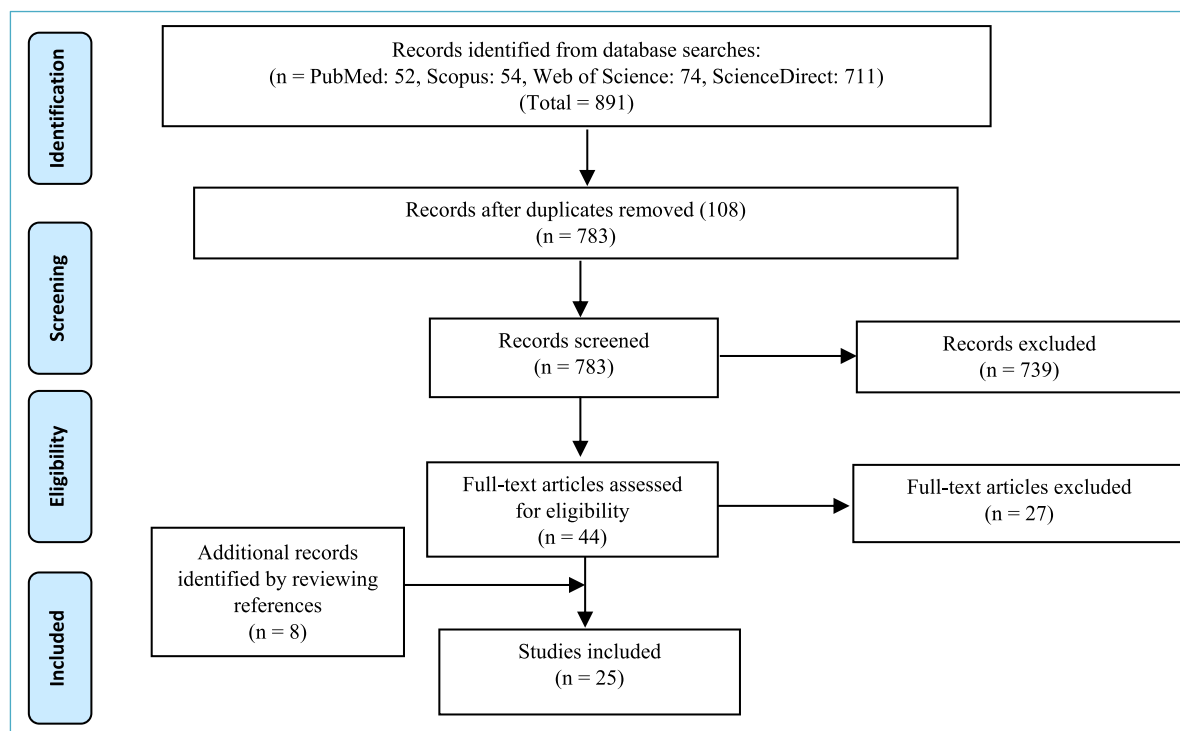


Fig. 2. Preferred Reporting Items for Systematic Reviews and Meta-Analyses Principles flow diagram outlining the care coordination literature review.

- Psycho-social support coordination activities are linked to the design or implementation of psychological assistance actions to support patient recovery.
- Services coordination activities are actions which design, implement, and adapt service dimension care at home or other HCOs (e.g., patient comfort and financial help). These activities also aid patient navigation in the health system.

The NC has an essential role in external coordination. In a systematic literature review by Karam et al. [44], several common key factors were identified between the conceptual frameworks of inter-professional coordination (internal coordination) and inter-organizational coordination (external coordination). However, the authors [44] recommended to facilitate communications between different departments, organize meetings, and drive inter-institutional programs which NC can focus on external coordination as an “integration coordinator”.

Coordination activities between NCs and professionals require different skills when compared with NCs and patient activities. In their theoretical framework, Radwin et al. [45] confirmed coordination activity distinctions between health professionals, and between health professionals and patients, by identifying individual responsibilities which meant that transitions ran as smooth as possible.

Preparation time is required for coordination activities. McDonald et al. [18] introduced the term “Plan for Coordination Challenges” to highlight activities supporting coordination, e.g., seeking additional information before a patient appointment or preparing educational or informative material for a therapeutic education session. The Plan for Coordination principle also applied to implementation and design phases. Beringer et al. [46] identified coordination design planning activity as a time for reflection where NCs assessed work situations and proposed solutions according to their own knowledge and an understanding of one another’s work.

NCs perform other tasks, which fall outside patient pathways, to compensate for organizational shortcomings. Hannigan et al. [43] highlighted the gap between coordination roles (by policy makers) and actual NC work. Indeed, they confirmed our observations; NCs

performed other tasks that fell outside patient pathways to compensate for staff shortages.

3.2.2. A new sub-category completes the micro-level, and three new categories illustrate organizational strategies (meso-level)

Our literature review helped define a new sub-category which complemented coordination analyses at the micro-level, and three categories which integrated organizational strategies at the meso-level.

Distinctions between formal coordination activity versus informal coordination activity. Professionals coordinate activities in different ways:

- Standardized exchange methods such as team meetings, rounds, charting, and operating procedures [26,28,44,47–49].
- Informal mechanisms such as hallway conversations and e-mail exchanges [28,44,48,50,51].

Strategies improving the relationship quality between actors. This category analyzed strategies which facilitated the smooth running of coordination activities. The literature provided ways of evaluating these strategies: establishing common goals [50,52], mutual knowledge among PPC actors [44,46,47,52,53], balance of power [44,54], and implementing emotionally safe environments [47]. This category encompassed these interactions and allowed us assess relationship quality between actors in an institutional context.

Work organization mechanisms. This category analyzed mechanisms which facilitated and ensured coordination activities between professionals:

- Strategy standardization to organize pathways, e.g., guideline development for a typical pathway [19,24,55].
- Competency standardization for actors in PPC [56].
- Organizational structures providing the necessary tools to ensure that all actors in PPC could communicate with each other [49,53,57], including those in ambulatory care and shared and ergonomic information systems [55,58].

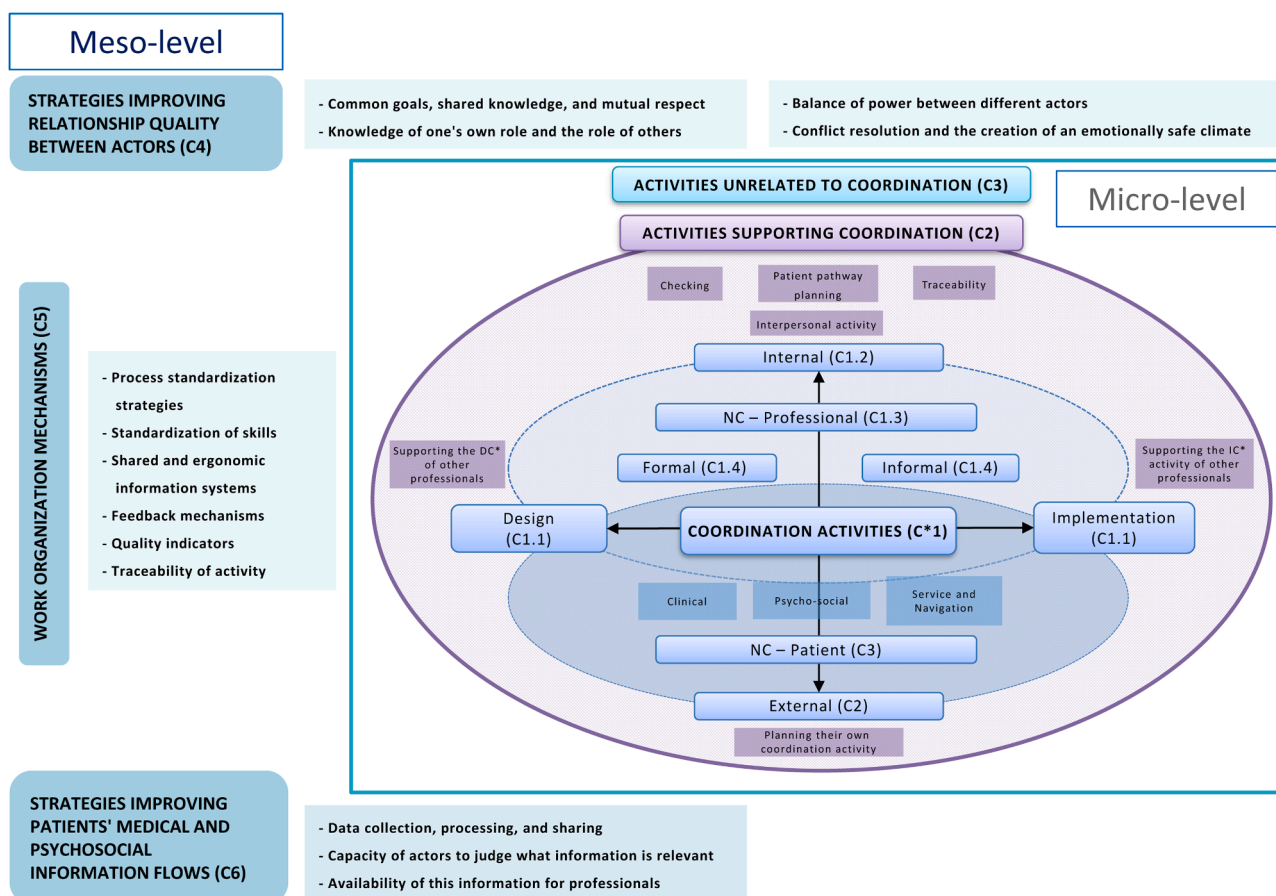


Fig. 3. The final framework used to analyze the Activities of the PATient PATHway Nurse Coordinators in Oncology (APANCO).

*C: Category
 *DC: Design Coordination
 *IC: Implementation Coordination

- The design of feedback mechanisms/exchanges between pathway participants [44,47]
- Quality indicators and procedures are designed and anchor activity traceability in institutional culture processes [56].
- Roles dedicated to PPC are created [43,44,59,60]

Strategies improving the quality of a patient’s medical and psychosocial information flow. This category analyzed strategies improving the quality of a patient’s medical and psychosocial information flow at institutional level. This flow (from the patient, between professionals, or with the patient) was described as a key coordination activity lever. Information flow refers to collecting, processing, and sharing data between the patient’s care team, the ambulatory care, and HCOs. Similarly, information flow implies a capacity to judge which information should be collected and shared with actors in the pathway [22,56,58,60,61].

4. Discussion

The APANCO framework provides insights on how oncology patient pathways are coordinated by NCs from an organizational perspective. The framework comprised six main categories, three at the micro- and three at the meso-level. The first categories analyzed real NC activity and accounted for activities related (or not) to PPC from a micro-level perspective. Meso-level categories considered the organizational context and how work organization strategies impacted NC work.

Our framework provides new knowledge in two areas. Firstly, it enriches concepts associated with care coordination. Current frameworks by Leijten et al. [62] and Colombani et al. [27] adequately

identify care coordination components at the three macro-, meso-, and micro-levels. However, within this context, the APANCO framework specifically enriches the micro-level [28] by describing coordination practices and analyzing activities from organizational perspectives. Our framework articulates the actions underpinning PPC design and implementation (sub-category 1.1), and how pathway dynamics transition both inside and outside HCOs (sub-category 1.2). APANCO also distinguishes coordination activities performed between NCs and other actors (sub-category 3), via formal or informal mechanisms (sub-category 4). Colombani et al. [27] also focused on the micro-level; They centered on care coordination activities (tools and effects) and activities related to patient services. Our framework is complementary and encompasses coordination and non-coordination activities. It highlights coordination activity by distinguishing between proper and support activities (Category 2). Additionally, category 3 highlights non-coordination activities which identify flaws in work organization strategies.

Secondly, apart from considering real NC activities, APANCO analyzes the influence of organizational strategies at the meso-level by analyzing strategies which improve relationship quality between actors (category 4), work organization mechanisms (category 5), and strategies improving the quality of a patient’s medical and psycho-social information flow (category 6). This facilitates a comprehensive description of NC activities, without passing normative judgment and analyzing the place of the NC in organizations. Thus, activities as real-time experiences are considered.

4.1. Implications

In terms of developing PPC oncology roles and policies, the operational contribution of the APANCO framework is two-fold. Firstly, it orients skills required for NCs as it provides an overall view of their real work content. While different actions require clinical skills (e.g., understanding therapeutic strategies and analyzing toxicity effects), other actions require more organizational skills (e.g., helping coordinate the activities of other professionals). Thus, considering these observations is highly relevant as these organizational skills are often invisible but essential in patient pathways [63]. Similarly, APANCO recognizes the importance of NCs in transition from in-patient to ambulatory care. Therefore, it emphasizes the need for NCs to develop communication and organizational skills, to identify and collaborate with all professionals involved in patient pathways. This is critical because a lack of coordination in in-patient and ambulatory care compromises patient safety and increases healthcare spending [6].

Secondly, the APANCO framework may be used as a tool for care team managers to evaluate and understand how oncology patient pathways are coordinated by NCs. In considering these elements, duplicated PPC roles between different HCOs can be avoided, and patient pathway fluidity improved. While PPC roles are being developed in hospital and ambulatory settings, poorly defined NC activities can cause overlap between different roles [15].

4.2. Study limitations

Our study had several limitations. Firstly, empirical data were gathered from only two HCOs. To generate a more comprehensive view of coordination activities in patient pathways, a more in-depth analysis of several institutions is warranted, e.g., ambulatory care. Also, the study was conducted within an oncology context, therefore, we encourage more studies in other clinical contexts. In both instances, confrontation of empirical data with a literature review provided a general scope for the proposed framework. Secondly, the literature review was applied to the coordination concept without reference to PPC roles. Consequently, specific NC activities may have been overlooked, however, our empirical study data, which specifically focused on NC activity, reduced possible bias. Finally, despite our broad objectives, some articles dealing with general coordination activities were possibly not selected, therefore additional information was not gathered.

5. Conclusion

Despite these minor limitations, APANCO provides useful knowledge for health policy actors who develop and manage oncology care coordination. Due to the highly complex nature of cancer and associated clinical requirements, oncology patient pathways are multifaceted, therefore frameworks such as APANCO are required to analyze and evaluate real-time roles and how they impact care coordination.

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Declaration of Competing Interest

The authors declare none.

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