The assessment of interprofessional practice in mental health nursing with ethnographic observation and social network analysis: a confirmatory and bibliometric network study using VOSviewer

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Summary. Introduction. Despite numerous techniques for assessing mental health nursing abilities and accomplishments, most practice in psychiatric wards is based on observable clinical behaviours and actions. VOSviewer can perform bibliographic network analysis (BNA), extracting all central topics that identify core behavioural skills in mental health nursing and essential elements in interprofessional practice (IPP). **Aim.** The current study captures the critical concepts in mental health nursing assessment by performing a BNA of essential topics on ethnography, social network analysis, and interprofessional care. **Methods.** A qualitative BNA with a VOSviewer extracted relevant topics from a total of 542 articles obtained from Microsoft API. A subsequent confirmatory quantitative analysis with NVIVO weighed the percentages of the relevant issues and words extracted by the VOSviewer. Boolean keywords searched were 'ethnography,' 'social network analysis,' 'interprofessional', 'psychiatry' and 'hospital'. **Results.** Major themes identified in ethnography, IPP, and social network analysis for nursing assessment were those of 'communication' (11.63%), 'whole' (9.29%), 'knowledge' (7.66%), 'person' (7.52%), 'activity' (6.31%) and 'collaboration' (6.10%). **Discussion.** The current study has proven the value of BNA in extracting relevant topics in target literature. VOSviewer captured salient issues in mental health nursing assessment, including ethnographic observations, social network analysis, and IPP. The results confirmed the value of focusing on collaborative care, reciprocity, knowledge management, and information sharing in assessing mental health nursing performances.

Key words. Bibliographic network analysis, bibliometrics, education, ethnography, interprofessional, mental health nursing, social network analysis, VOSviewer.

La valutazione della pratica interprofessionale nell'assistenza infermieristica per la salute mentale con osservazione etnografica e analisi dei social network: uno studio di rete confermativo e bibliometrico utilizzando VOSviewer.

Riassunto. Introduzione. Nonostante le numerose tecniche per valutare le capacità e i risultati infermieristici della salute mentale, la maggior parte della pratica nei reparti psichiatrici si basa su comportamenti e azioni cliniche osservabili. VOSviewer può eseguire un'analisi di rete bibliografica (BNA) estraendo tutti gli argomenti centrali che identificano le competenze comportamentali di base nell'assistenza infermieristica per la salute mentale ed estrarre elementi essenziali nella pratica interprofessionale (IPP). **Obiettivo.** L'attuale studio mira a catturare i concetti critici nella valutazione infermieristica della salute mentale eseguendo un BNA di argomenti centrali su etnografia, analisi dei social network e assistenza interprofessionale. **Metodi.** Un BNA qualitativo con un VOSviewer ha estratto argomenti rilevanti da un totale di 542 pubblicazioni ottenute dall'API Microsoft. Una successiva analisi quantitativa di conferma con NVIVO ha pesato le percentuali degli argomenti rilevanti e delle parole estratte dal VOSviewer. Le parole chiave booleane cercate erano "etnografia", "analisi dei social network", "interprofessionale", "psichiatria" e "ospedale". **Risultati.** I principali temi identificati nell'etnografia, nell'IPP e nell'analisi dei social network per la valutazione infermieristica sono stati quelli di "comunicazione" (11,63%), "globalità" (9,29%), "conoscenza" (7,66%), "persona" (7,52%), "attività" (6,31%) e "collaborazione" (6,10%). **Discussione.** L'attuale studio ha dimostrato il valore del BNA nell'estrazione di argomenti rilevanti nella letteratura di destinazione. VOSviewer ha catturato argomenti salienti nella valutazione infermieristica della salute mentale, comprese le osservazioni etnografiche, l'analisi dei social network e l'IPP. I risultati hanno confermato il valore di concentrarsi sull'assistenza collaborativa, la reciprocità, la gestione della conoscenza e la condivisione delle informazioni nella valutazione delle prestazioni infermieristiche di salute mentale.

Parole chiave. Analisi dei social network, analisi di rete biobliografica, bibliometria, etnografia, infermieristica di salute mentale, interprofessionale, istruzione, VOSviewer.

Introduction

ETHNOGRAPHIC OBSERVATION IN PSYCHIATRIC WARDS

Ethnography is a qualitative research approach focused on individuals' knowledge[1]. Ethnography also allows a study of organisations at the macro level while improving the understanding of the procedures, events, and habits through the direct observation and engagement of the observer with the participants and setting[1]. Ethnographic research is usually applied to classify behaviours that the existing research cannot anticipate[2]. Furthermore, eth-

nography offers a more comprehensive and up-to-date clarification of collective behaviours extracted via lengthy observations and exchanges with target people in their setting; it also provides the opportunity to test hypotheses in their vigour using extended site visits[3]. The main target of ethnographic research in health care is groups of persons usually oriented towards communal interests[4]. Ethnographic research also helps discover the unspoken and overt aspects of a specific culture[5]. Besides, ethnography captures the common interpretation of what is essential and significant to people under observation[6]. As health carers perform most of the work in hospital settings, ethnographic research has focused on their actions with the researcher as an active participant[7]. However, as ethnographic research uses detached observations, these last are exposed to the researcher's bias and partial reliability when treated as isolated[8]. The authors of the current study identified the advantage of ethnographic observation in psychiatric wards concerning the assessment of teams and nurses' performance: 1) the observed behaviour represents the nursing skill to be analysed and cannot be explored or expressed by verbal accounts, 2) nurses and health carers might be worried to be criticised about verbal accounts during the reflective practice of their performances[9]. Aspects captured by ethnographic observations of psychiatric nurses and mental health practitioners are conduct, behaviours, skills, and actions that conform to local regulations. The classical ABC model states that when people are engaged in some events (A), they mature a series of beliefs about these events (B), which regulate their psychological and behavioural response to them (C)[10,11]. The ABC observation is vital in confirming that behavioural skills are appropriately applied to psychiatric wards by nurses and doctors, such as observation levels, interviews, and assessments[9]. At times, it might occur that policies to raise health carers' aptitude to do more complicated jobs does not designate that these skills are put into action[12].

Ethnographic observation and assessment of teamwork in psychiatric wards can also show non-verbal or para-verbal communication signalling practitioners' divergent views or reactions about patients risks to self or others[13]. It then becomes vital to understand how to observe in ethnographic research. There are four significant forms of how observation is conducted:

- a complete observer is a covert approach where the researcher is detached and invisible to the participants;
- an observer-as-participant is an overt approach where the researcher's role is to assess a population with brief exposures to collect observational data, often used for exploration in follow-up interviews;

- a participant-as-observer is an overt approach, where the researcher aims to integrate into the setting, and its role within the context of the study is acknowledged;
- a complete participant is a covert approach where the researcher is fully immersed and integrated into the setting, referred to as going native, without disclosing him/herself as a researcher[1].

The primary justification for prioritising ethnographic observation and assessment of accounts from interprofessional teams follows:

- the observed behaviour of the mental health professional conflicts with what is verbally disclosed during formal interviews: e.g., feeling well while revealing behavioural hints of professional burnout;
- the observed behaviour represents the physical skills and performance to be assessed and cannot be explored or expressed verbally: e.g., speed in performing a task;
- the observed nurses' behaviours with patients represent a more reliable account of the application of clinical governance rules;
- the interprofessional nursing team has its dynamics that cannot be verbalised;
- the interprofessional nursing team acts asynchronously, and the result can only be observed in patient care outcomes[9].

Social Network Analysis (SNA), explored in the next paragraph, results from ethnographic observations of mental health team dynamics. SNA is here proposed as a tool to assess nursing teams dynamics and the layout of social networks in psychiatric wards as to what concerns interprofessional practice.

SNA OF MENTAL HEALTH NURSING TEAMS

There has been a growing interest in using SNA to capture interprofessional team relationships and provide pictorial and numerical models to characterise relationship typologies[14]. The dynamics of interprofessional teams have been explored through ethnographic studies in mental health hospitals. We typically refer to 'relations' between units in a social network, while a social network is restricted by a set or sets of participants and their relationships[15]. Researchers that use SNA to analyse task-based groups may ultimately assist interprofessional teams in identifying ways to enhance their procedures[16]. A graphic depiction of SNA also has an advantage over quantitative research in that it graphically demonstrates concealed relationships among network members[16,17]. SNA is a set of qualitative techniques for depicting interpersonal and social activities, such as interactions, connections, group relationships, and consultations, that link one network unit to other units while quantifying the statistical dif-

ference of the interactions' forms[18]. The "nodes" of the social network are represented by individuals or organisations, while the "ties" reflect some reciprocal interaction between the nodes, which may take many forms[19]. Double-headed arrows, which indicate information sharing, asset trading, or cooperative ventures linking topics/nodes in the network, often depict exchanges between units[19]. Numerous parameters indicate the typology of interactions between units. The subcategory of "indegree centrality" denotes the number of ties directed by one participant to others, also showing the "prestige" of that person; in comparison, "out-degree centrality" designates the number of ties received by one person from others, also indicating the "expansiveness" of that person[20]. The open-source SocNetv 2.4 software can perform all activities to create a social network with comparative statistics[21]. SNA begins with the premise that all inter-unit connections are interdependent[22]. In another study from the authors of the current study, significant configurations of social networks in psychiatric wards were categorised as follows:

1. *isolation*: despite having essential knowledge regarding patient care and management, some mental health nurses on the team are seldom invited in team decisions and discussions;
2. *hyper-centralisation* is the case of a single professional who is the team leader or the person who holds the most critical information to be shared within the team; in extreme cases, there is unidirectional communication top-down, which does not allow equalitarian knowledge management; the outbound arrows of communication and actions in the network are directed from this central figure to the most peripheral ones;
3. *clustering*: professionals with similar backgrounds tend to cluster and to form tighter bonds with the exclusion of those with a different cultural and educational background; e.g., senior psychiatrists and senior mental health nurses in hospitals create clusters different from those present in the community;
4. *patient as the only centre* where several experts work on the same service user, although they may not collaboratively approach the treatment or share knowledge[23].

In conclusion, SNA is used to capture the dynamics of interprofessional teams and IPP (interprofessional practice) in mental health nursing and provide recommendations in policies aiming to improve learning in collaborative care. Concepts of IPP are explored in the next paragraph.

IPP in Mental Health Nursing

Healthcare workers who partake in interprofessional teams learn 'with, from and about one another'[24,25]. The pooled expertise of individuals working together in a small group facilitates interprofessional learning[26]. Healthcare workers practicing in psychiatric care have the chance to develop their emotional intelligence and empathy abilities via progressive collaboration in interprofessional teams, which spread across the group, resulting in better patient-centred care skills[14]. In fact, through emotional intelligence, healthcare workers can mature better compassion towards their patients[27]. Emotional intelligence is defined as the skill to use emotions and the awareness about feelings to improve thinking[28]. However, implementing regulations to improve health care workers' capacity to do more complex tasks does not guarantee that these skills be put into effect[12]. The kind of communication between interprofessional team members and how this may influence interprofessional settings and performances may be captured SNA[29]. The fast development of online technology has led to a rise in worldwide health-related data exchange. Health and social care workers increasingly use virtual communities of practise (VCoPs) for learning, support, continuing professional education, knowledge management, and information sharing[30]. Interprofessional practice in psychiatry will likely be shared between real and virtual interactions between professionals involved. Smartphone technology and Ecological Momentary Assessment can be used to virtually link interprofessional trainees to their teachers to provide instant feedback about the performed practice in psychiatry[31].

To improve collaborative practice, Curtin University in Australia created an interprofessional framework that emphasises the need of enhancing communication, conflict resolution, and reflection[32]. Each member of the interprofessional team should see how his/her expertise supports that of others[32]. The Interprofessional Educational Collaborative, which is utilised in the United States, emphasises the importance of shared communication, team building, cooperation, and social skills while working in an interprofessional teams[33]. In interprofessional practice, the World Health Organization emphasises the importance of knowing the patient's requirements, the need for learning and critical reflection[34]. The Combined Universities Interprofessional Learning Unit (CUILU) was founded by medical schools in the United Kingdom, such as Sheffield-Hallam and the University of Sheffield, to guide interprofessional education (IPE), emphasising the importance of reflective practice and teamwork ethics for a successful IPE[35]. As IPP frameworks and practitioners' required abilities, the IPP competencies framework has been split into six areas:

1. *teamwork*: working with colleagues in many fields of medicine;
2. *duties and roles*: knowing the roles and responsi-

bilities of each member of the interprofessional team;

3. *communication*: recognising barriers to cooperation; questioning role assumptions; providing unified patient care; expressing personal opinions to others; actively listening to others; delivering information on typical patients clearly and concisely;
4. *critical thinking and learning*;
5. *relationship with patients*;
6. *ethical practice*: individual biases against others are recognised and acknowledged; self-reflective practice is used to enhance coordinated care; the collaborative approach is used to improve care results, client safety, and decrease medical mistakes; and an environment of shared regard and collective ideals are promoted[32-40].

Methods

The current is an exploratory analysis of major themes emerging from the literature on ethnography, interprofessional practice, and social network analysis. The method included a VOSviewer search of major co-citations words in the thematic areas and Boolean keywords search of ('ethnographic research'), ('ethnography AND hospitals'), ('ethnography' AND 'interprofessional') and ('ethnography' AND 'social network analysis') on Microsoft Research API (https://msr-apis.portal.azure-api.net/). VOSviewer 1.4.0. is a software program developed by the University of Leiden; it creates distance-based bibliometric maps as diagrams in which the distance between two keywords signals the intensity of their relationship as extracted and merged from the scientific literature[41]. The questions that VOSviewer helped to reply are: 1) Within a given scientific subject, what are the key topics or study fields? 2) What is the relationship between these topics or fields?[42]. During the construction of a bibliographic network, the nodes in a bibliometric network, in the distance-based approach, are placed so that the distance between two nodes approximates their relatedness[41]. A shorter length indicates a stronger relationship, although, in many circumstances, elements on distance-based maps are distributed unevenly[43]. The closer the two nodes are, the more related they are[41]. NVIVO software analysis extracted the generalisations from the summative narrative obtained by merging the targeted words extracted by VOSviewer[44]. Confirmatory quantitative analysis with MedCalc for Windows version 19.4 and Chi-square statistic helped accept or reject the null hypothesis Ho that all terms and themes were equally distributed[45]. The Alpha error to reject Ho was set at p=0.05.

Results

VOSviewer extracted a total of 542 articles from the primary keywords (table 1). NVIVO summarised in thematic areas the salient points after VOSviewer revealed the prevailing words.

Ethnographic research term search extracted three clusters with significant themes being (figure 1a):

■ *cluster 1*: complexity, family, group, information, nature, order, participant observation, relationship, value;
■ *cluster 2*: ethnographic fieldwork, knowledge, power, ethnographer impact;
■ *cluster 3*: culture and development.

Social network analysis and hospital term search extracted two clusters with significant themes being (figure 1b):

■ *cluster 1*: department, evidence, network;
■ *cluster 2*: case study, data, nurse, patient, research.

Ethnography and hospital term search extracted four clusters with prevalent words being (figure 1c):

■ *cluster 1*: dementia, hospital setting, person, risk, staff, team, ward;
■ *cluster 2*: decision, decision making, evidence, hospital ethnography, field;
■ *cluster 3*: barrier, change, clinical ethnography family, quality, theme;
■ *cluster 4*: consequence, ethnographic study, knowledge, work.

Social network analysis and psychiatry search terms extracted 1 cluster as word frequency was reduced to one due to the limited number of articles (two): activity, central author, central institution, collaboration, collaborative behaviour, collaborative map, web, whole network (figure 1d).

Table 1. Articles extracted from VOSviewer analysis in API.

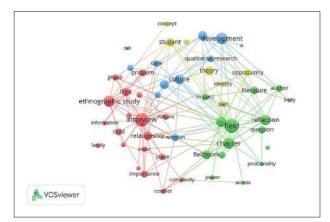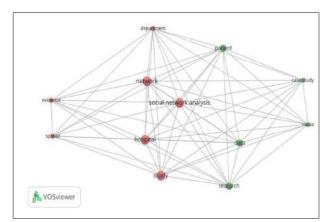| Key words	Number of articles extracted
Ethnographic research	480
Social network analysis; hospital	4
Ethnography; hospital	49
Social network analysis; interprofessional	7
Social network analysis; psychiatry	2

Figure 1a. Ethnographic research.

Figure 1b. Social network analysis; hospital.

Figure 1c. Ethnography; hospital.

Figure 1d. Social network analysis; psychiatry.

Figure 1e. Social network analysis; interprofessional.
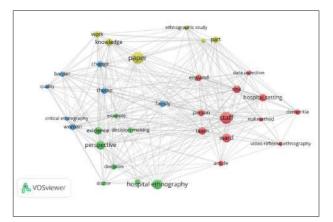
Social network analysis and interprofessional search terms extracted three clusters (figure 1e):

- *cluster 1*: analysis, care, colleague, community, context, interprofessional collaboration, knowledge, network, person, reciprocity;
- *cluster 2*: centre, collaboration, communication pattern, interprofessional education;
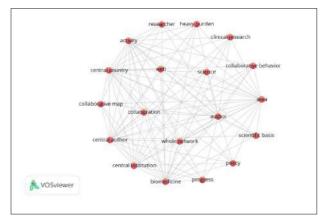- *cluster 3*: impact, program.

SUMMATIVE NARRATIVE

NVIVO elaborated all the words extracted by VOSviewer to the final clustering of weighed words assembled by generalisation. The generalisation clusters suggest that ethnographic research, social network analysis and interprofessional practice are concepts fully integrated with mental health care (table 2 and figure 2). Ethnography and social network analysis can assess team dynamics and explore how interprofessional practice occurs. The concepts of network pattern appear linked to the topics of 'staff, wholeness and barrier.' Another theme that emerged in thematic analysis and word findings was knowledge related to 'evidence, institution, centre, and education.' Results appear to confirm that ethnographic assessment of mental health nursing can help explore patterns of knowledge sharing in interprofessional teams, capture the centralisation of information, and explore forms of shared knowledge. It is assumed that these factors shall promote evidence-based practice in mental health nursing and integrated care under a collaborative approach to patient care. The quantitative analysis of weighted percentages of word clustering from NVIVO rejected the null hypothesis that top-

Table 2. Summative analysis by NVIVO with the generalisation of the words extracted by VOSviewer.

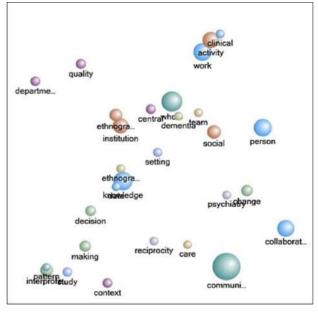| Word	Weighed percentage (%)	Similar words
Communication	11.63	Analysis, author, communication, community, evidence, network, pattern, program, staff, theme, ward
Whole	9.29	Barrier, case, field, network, pattern, person, staff, web, whole
Knowledge	7.66	Case, centre, education, evidence, field, institution, knowledge, pattern, program, study, theme
Person	7.52	Author, case, colleague, family, nurse, patient, person, study, ward
Activity	6.31	Activity, analysis, behaviour, care, centre, education, pattern, research, work
Collaboration	6.10	Collaboration, collaborative
Work	6.07	Analysis, care, central, research, risk, staff, study, work
Institution	5.28	Hospital, institution
Ethnography	3.66	Ethnography
Social	3.66	Social
Interprofessional	3.66	Interprofessional
Making	2.86	Author, making, map, pattern, program, web, work
Decision	2.44	Decision
Consequence	2.24	Change, consequence, impact
Quality	2.24	Change, making, quality
Change	2.00	Change, impact, institution, map, work
Study	1.90	Field, map, research, study, work
Context	1.83	Context, setting
Central	1.63	Centre, central
Clinical	1.22	Clinical
Data	1.22	Data
Dementia	1.22	Dementia
Department	1.22	Department
Ethnographic	1.22	Ethnographic
Psychiatry	1.22	Psychiatry
Reciprocity	1.22	Reciprocity

Figure 2. NVIVO clustering of total words extracted by VOSviewer according to generalisations.

ics and themes were equally distributed (χ^2=30.31 [df=3], p<0.001).

Discussion

The current study has confirmed the importance of ethnographic studies to capture the social networks and interprofessional care in mental health nursing. The literature review also captured the centrality of collaborative care, reciprocity, and shared knowledge in mental health nursing. The two possible instruments for non-intrusive analysis of professional practice were ethnographic research and SNA. Any team member is constantly required to report the social events to psychiatric wards as a matter of clinical governance. Therefore, any nurse practitioner can cover the role of participant-observer in ethnography and observation of targeted behaviours. Besides, ethnographic observations are frequently the only instrument to gather data about observed behaviours and skills and decide how these last match clinical goals in mental health nursing. More intrusive assessments, such as anonymous questionnaires, might not capture the totality of clinical behaviours in a culture that is so active and variable as in hectic psychiatric wards and in the community that surrounds them. Besides, not all clinical skills in mental health nursing and multidisciplinary team performances can be easily expressed through verbal narratives.

The literature review extracted pervasive topics in ethnography, SNA and IPP in mental health nursing. The results confirm the impact of *communication* in the mental health networks and the community. Also

central is the concept of *wholeness*, and the configuration of the network in terms of patterns of relationship; emerging is the idea of person suggesting the need to focus on individuals (professionals or patients) in their totality. Besides, the study also extracted the concept of barriers. When these findings are matched with what is already known in the literature, it emerges that to promote integrated care in mental health nursing, practitioners shall be mindful of communication, barriers to communication, and collaborative care to create an integrated whole.

Knowledge, knowledge management and knowledge sharing will guide mental health nurses in evidence-based practice focused on the *patient's person*. Learning interprofessional practice will reinforce collaborative mental health care. Other concepts extracted from bibliometric analysis and summative narrative are centrality, context, data, change, and reciprocity. These findings support the previous literature suggesting that the promotion of interchange, data sharing in psychiatry, and focus on the context and setting of the service user are central activities for promoting patients' safety and health.

The current study has some limitations as it only extracts basic concepts from literature and does not provide evidence that the topics of interest are present and applied in real-life contexts. More detailed research on outcomes might have provided more convincing evidence of this aspect. However, this last was not the goal of the current study.

Conclusions

The current mini-review of literature using bibliometric and network analysis has captured salient points in collaborative care in mental health nursing. Interprofessional care is a pivotal point in all clinical aspects and could be captured by ethnographic and participant observation of multidisciplinary mental health teams.

Take home messages.
What is already known about the topic?
• By accessing seminal publications in the Web of Science, bibliometric analysis can generate a comprehensive co-citation network of topics of interest by clustering them according to their similarities.
• Ethnographic observation can capture the core elements for assessing interprofessional teams' behaviours in mental health nursing.
• IPP helps promote the care of psychiatric patients by collaborative nursing in mental health.
What does the paper add to existing knowledge?
• Despite extensive tools to measure skills and achievements in mental health nursing, most of the nursing practice pivots on observable clinical behaviours and skill performance.

• Observing and understanding nursing IPP is part of their pedagogical assessment. Bibliometrics of ethnography and social network analysis helped shed light on pervasive topics in teams' dynamics in mental health nursing and learning.
• Bibliometric analysis in the current study captured the centrality of collaborative care, reciprocity, and shared knowledge in mental health nursing. The present study has confirmed the value of ethnographic observation and social network analysis to assess participatory care in nursing.
What are the implications for practice?
• Bibliometric Network Analysis with VOSviewer can extract all relevant topics and themes that characterise target behaviours in mental health nursing. BNA can suggest what fundamental elements are central in interprofessional practice and quality assessment in mental health nursing.
• Observing, assessing and describing IPP via ethnographic observations and social network analysis can help set the core behavioural skills in mental health nursing.

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