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Qualitative Research on Emergency Medicine Physicians: A Literature Review

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ABSTRACT

Aim: This study aims to review the qualitative research studying Emergency Medicine (EM) physicians in Emergency Departments (ED). **Background:** Qualitative research aims to study complex social phenomena by other means than quantification often through verbal or observational investigation. EM is a highly complex medical and social environment that has been investigated through qualitative methodologies. A literature review is needed to show what qualitative studies illuminate about EM and why this work is important to develop EM as a complex organizational and communicative practice. **Methods:** Electronic databases of English peer-reviewed articles were searched from 1971 to 2012 using Medline through PubMed and PsychINFO. This search was supplemented with hand-searches of *Academic Emergency Medicine* and *Emergency Medicine Journal* from 1999 to 2012 and cross references were reviewed. The key words used were emergency medicine, qualitative, ethnography, observation, interview, video, anthropology, simulation, and simulation-based. **Results:** 820 papers were identified and 46 studies were included in this review. This literature review found that the reviewed qualitative studies on EM physicians were designed using the following strategies of inquiry: Ethnography, mixed methods, action research, grounded theory, phenomenology, content analysis, discourse analysis, and critical incident analysis. The reviewed studies were categorized into four main themes: Education and training, communication, professional roles, and organizational factors, and into 12 sub-themes. **Conclusion:** The strength of qualitative research is its ability to grasp and operationalize complex relations within EM. Although qualitative research methodologies have gained in rigor in recent years and few researchers would question their value in studying complex medical and social phenomena, rigorous design in qualitative studies is needed. Qualitative research studies that stick with one strategy of inquiry that they follow closely are likely to yield more valid studies.

Keywords: Emergency Medicine; Emergency Department; Review; Qualitative Research; Interview; Observation

1. Introduction

Emergency medicine (EM) is performed by emergency physicians collaborating with other health professionals in highly complex practices that need to be researched through innovative means. Qualitative research might be particularly relevant to EM for at least three reasons. First, it is apt at illuminating processes pertaining to physicians' thinking, feeling and acting as EM physicians. Second, qualitative research might be useful to capture EM organizational and team processes as complex medical and social practices [1]. Yet qualitative research has probably more often been used in medical education research and research on critical patient care [2-4] than to emergency care [5-8]. Third, qualitative research can lead to theory development hopefully with clinical or organizational implications for EM and Emergency Departments (ED). But research is needed that reviews

qualitative research in EM and critically appraises qualitative research papers. However, the critical appraisal of qualitative research may be difficult because there is no single standard for carrying out qualitative research and hence qualitative research varies according to the applied methodologies or strategies of inquiry. The point is that achieving a nuanced understanding in this field is fairly complex. Furthermore thorough assessment of qualitative research is an interpretive act that requires informed reflective thought rather than a simple application of a scoring system [9]. A review of qualitative research in EM is relevant because it might enhance emergency care through in depth descriptions of contextual health care. And by moving beyond description and emphasizing the development of new concepts and theories, qualitative researchers can help to unpack the processes surrounding EM care and explain "how, why and what" is going on [10]. Thus it might inform practice, prevent errors and

enhance patient safety [11,12], and also add to a deeper understanding of EM as a social practice.

2. Aim

This study aims to review the literature on qualitative research of health professionals involving EM physicians in ED.

3. Review Methodology

3.1. Study Design

A literature search in the medical and social sciences literature domains was carried out. Electronic databases were searched from 1971 to 2012. This study utilized Medline (through PubMed) and PsychINFO. Access strategies included the MeSH search term Emergency Medicine combined with the following keywords: qualitative, ethnography, observation, interview, video, anthropology, simulation, and simulation-based. Searches were run in September and October 2012.

3.2. Search Strategy

All English-language articles published in peer-reviewed journals from 1971 to 2012 were included in the search. In a first step, titles and abstracts of all 820 papers identified using the database searches were screened by the first author to ascertain whether the studies were designed with a qualitative methodology in EM and/or ED. In a second step, the exclusion criteria were applied, leading to retrieval of full text papers to be considered for inclusion. Full text articles were also retrieved when there was insufficient information in the abstract. The full text of selected articles was retrieved whenever possible.

In a third step, recognizing that electronic indexing can be unreliable [13,14], a hand search of all editions of the key journals Academic Emergency Medicine and Emergency Medicine Journal from 1999 to September 2012 was performed. This period was chosen due to the previously identified papers which were published from 1999 to 2011. Titles suggesting a qualitative approach that had not already been identified were obtained for examination of abstract and subsequently for full text if the abstract was found relevant. 26 papers were identified during this search and in total 46 articles were agreed for inclusion and analysis. From all the full text articles retrieved, reference lists were used to identify and potentially include additional papers not discovered during the initial search.

The retrieved abstracts were independently read by the two researchers to determine whether a full text article should be retrieved. The full text article was obtained if the abstract suggested that the study was a qualitative research study in the field of EM or ED's and did not meet the exclusion criteria.

Figure 1 provides an overview of the process of identifing the articles included in this review. From here it can be seen that 46 papers were agreed for analysis and a total of 56 articles were excluded by review of full text.

3.3. Inclusion End Exclusion Criteria

Only original research articles were included. Inclusion criteria were: Qualitative research in EM/ED using observations, interviews and/or surveys with a qualitative component applying qualitative strategies of inquiry were included in the study. Selected were studies on practicing EM physicians working and training in the ED.

The exclusion criteria were: Qualitative interviews if solely used for purposes of quantification or tabulated counts of responses Studies involving solely students or other health care professionals than physicians (e.g., nurses, physiotherapists, paramedics) Papers that exclusively studied patients (patient perceptions, patient relatives, etc.) and papers on recruitment to EM and intern rotations Letters, case reports, commentaries, conference papers, descriptive papers and literature reviews, or reports on pre-hospital personnel.

If there was reasonable doubt as to whether the study was in fact conducted within the EM or ED framework, for instance due to differences in international usage of the terms EM and ED The included studies are listed in **Table 1**.

4. Strategies of Inquiry in Qualitative Research

Before going into the results of this review, eight different strategies of inquiry pertaining to the qualitative research studies in this review will be briefly explained. The advantages and disadvantages of these qualitative strategies of inquiry are described in **Table 2**.

4.1. Ethnography

Ethnography grows out of the field work tradition of anthropology and sociology. Ethnography as qualitative strategy in medical research traditionally employs participant observation, open-ended interviewing and documentary analysis [15,16]. The hallmark of ethnography is participant observation where the researcher spends time in the field for prolonged periods of time [17]. Although field studies can be more time consuming than interviews, observational strategies are generally acknowledged valuable for gathering information about how people act rather than how they say they act. Ethnography is therefore an important approach to developing understanding about complex social interactions because it allows the researcher through participant observation to study medical work *in situ* [18].
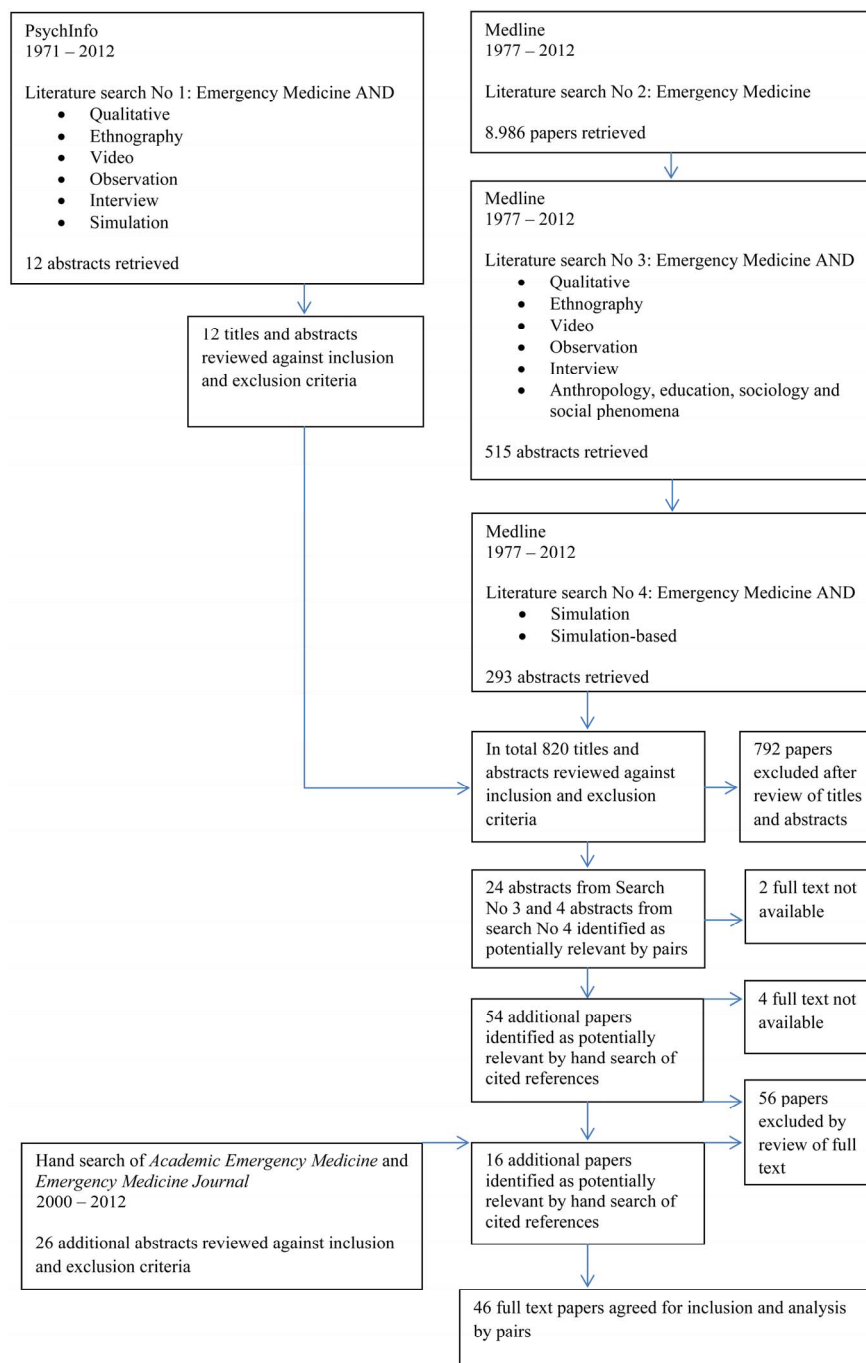
Figure 1. Flowchart of search and selection strategy.

4.2. Mixed Methods

Mixed methods research combine elements from both qualitative and quantitative paradigms to produce converging findings in the context of complex research questions [19]. Mixed methods research integrates quantitative with qualitative research to answer how and why social phenomena are patterned the way they are [20]. The use of mixed methods in clinical medical studies is increasing, and aims to answer questions about both "how many" (prevalence, statistical significance, etc.) and "why" (sense-making) in the same study, and as such mixed methods are an important and useful approach to many questions in emergency care [21]. Central to a mixed methods study is a clear and strategic relationship among the methods in order to ensure that the data converge or triangulate to produce deeper insight than what a single method could yield [22].

Table 1. Included studies.

Authors	Methods	Purpose	Strategies of inquiry	Target group (n=) and sites	Outcomes	Self-reported -limitations
Anderst & Dowd [59] (2010) US	Focus group interviews (3) Audio-recorded and transcribed verbatim	Explore the comparative educational needs of training methods and assessment tools among clinicians in child abuse education	Content analysis	EM (8), pediatric (4) and family practice (10) physicians (Multiple sites: Urban/semi-rural)	EM physicians identified training and management tools targeting: Neglect, lack of medical care, interviewing, and court testimony	Small sample size
Apker, Mallak & Gibson [66] (2007) US	Semi-structured individual interviews (12) Audio-recorded and transcribed Software used for coding	To identify EM and internal medicine physicians perceptions of inter-service handoff communication	Thematic analysis Critical incident technique	EM (6) and internal medicine physicians (6) (Case study: Regional teaching hospital)	Barriers to handoff communication: Poor communication practices and insufficient information	Interviews relied on retrospection of handoffs
Apker *et al.* [103] (2010) US	Observations of handoff telephone conversations (24) Conversations transcribed verbatim	To develop and evaluate the Handoff Communication Assessment tool for EM physican-hospitalist handoff communication	Discourse analysis	Emergency physicians (26) and hospitalists (18) (Case study: Level 1 trauma center)	11 categories of behaviors identified concerning seeking, giving, and verifying information	Good inter-rater reliability, Single case study design. Telephone interviews with limited audio-quality
Bandiera, Lee & Tiberius [44] (2005) Canada	Structured telephone survey (33) Interviews transcribed	To determine important clinical teaching behaviors in ED	Grounded theory	EM physicians (Canadian EM teaching faculty) (33) (Multiple centers)	12 ED-specific teaching strategies identified concerning: Learner-centeredness, active learning, individual relevance, tailor teaching to the situation, good teacher attitude and be a role model, providing feedback	No double-coding of all data but good inter-rater reliability when done. Interviews relied on note taking
Bandiera & Lendrum [52] (2011) Canada	Semi-structured focus group interviews (5) Audio-recorded and transcribed verbatim	Perceptions of front-line teachers on competency-based ED education (related to the CanMEDS framework)	Grounded theory	Full-time faculty (21) (2 sites)	Faculty identified relevant roles of the CanMEDS framework for structuring teaching and learning	Generalization. Limited qualitative nature of the study due to the fixed research method; data saturation not reached
Bond *et al.* [64] (2004) US	Structured interviews after a simulation intervention (15) Survey Interviews transcribed Software used for coding scheme used	An educational intervention in a simulator lab scenario designed to lead participants to use a cognitive error trap		EM residents (15) (Case study)	Major themes: Positive experience, mistakes caused reflection/motivation, lab stressful and realistic, feedback wanted	Acceptable inter-rater reliability. Small sample size. Selection bias. One scenario
Bond *et al.* [63] (2006) US	Survey Randomized cognitive or technical debriefing Interviews transcribed Software used for coding	To assess learner perception of medical simulation and debriefing to improve understanding of cognitive responses	Content analysis	EM residents (57) (2 sites)	Cognitive debriefing facilitated understanding of cognitive responses	Moderate inter-rater reliability. Brief interviews (10 minutes). Interview questions not validated
Currie & Crouch [75] (2008) UK	Semi-structured individual interviews (8) Interviews transcribed verbatim Verification sought by respondents; half of respondents were asked to validate the interpretation of the interview	To explore professionals' perceptions of the professional roles in emergency care	Content analysis	EM physicians and nurses (8) (Case study: Large teaching hospital)	A positive blurring of health professionals' roles has taken place. But perceived lack of standardization and lack of clarification of: Role boundaries, driving forces, managing risks, training and professional roles	Small sample size. Single case study design. The researcher was working at the study site

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Dorfsman & Wolfson [53] (2009) US	Direct observation (25 sessions/18 months) Standardized observation tool with qualitative comments	To describe the implementation of structured direct observation of EM residents in ED	-	EM residents (32) (Case study: Level 1 trauma center)	Assessment of core competencies in real time. Provided insight into the strengths and weaknesses of residents individually and as a group. Provided specific and immediate feedback to residents.	The tool not validated. Subjectivity, observer bias. Hawthorne effect.
Dyas *et al.* [80] (1999) UK	Unstructured individual interviews (10) Audio-recorded and transcribed verbatim	To identify important factors accounting for reduction in trauma mortality	Thematic analysis	Key health trauma care providers (10) (Case-study)	Themes perceived as important for reducing mortality in trauma care: Policy, infrastructure changes and change in philosophy of care (trauma teams)	Recall bias. Small sample size
Eisenberg *et al.* [68] (2005) US	Direct structured observations (10 months) Survey Field notes transcribed Data analysis by all research team members	To explore EM communication processes	-	(2 sites: Level 1 trauma centers)	4.communication processes identified: Triage, testing/evaluation, handoffs, admitting	None reported
Eisenberg, Baglia & Pynes [81] (2006) US	Structured observations (6 months)	To explore communications of EM in a local context to develop more effective responses	Action research	(Case study: Urban community hospital)	Development of interpretive frameworks and providing new insights to staff addressing persistent organizational problems: Triage, registration, waiting, physical evaluation, test results, consulting, admission/discharge	Single site
Evans *et al.* [72] (2010) Australia	Interviews (27) Interview template Software used for coding	To develop a handover template between paramedics and trauma teams	Grounded theory	Trauma team members (17) Paramedics (10) (Case study: Level 1 trauma center)	Effective handover: Delivered succinctly and structured to inform immediate treatment. Trauma team members should learn effective listening	Single site Selection bias
Flowerdew *et al.* [77] (2011) UK	Semi-structured interviews (22) Audio-recorded and transcribed verbatim Software used for coding	To identify key stressors for ED staff and investigate associated behaviors	Phenomenology	Consultants (4), registrars (7), junior doctors (5) and nurses (6) (Case study: Teaching hospital)	Key stressors: Excessive workload, staff shortages. Leadership identified as a principal component of team-functioning and team training	Self-reported behavior. Small sample size
Goldman *et al.* [41] (2009) US	Semi-structured interviews (12) Interviews transcribed verbatim	To explore learning by EM residents while working in ED	Thematic analysis	EM residents (12)	Learning occurred individually and in social interaction	None reported
Goldman *et al.* [42] (2011) US	Semi-structured interviews (12) Interviews transcribed verbatim Coding scheme	To explore what EM residents believe helps them learn appropriate skills	Phenomenology	EM residents (12) (Case study: Academic medical center)	Major differences in the strategies used to learn clinical versus leadership skills	Small sample size
Hjortdahl *et al.* [78] (2009) Norway	Semi-structured interviews (12)	To explore which non-technical skills are important in trauma teams	Phenomenology	Nurses (4), an esthesiologists (4), surgeons (4) (4 sites)	An ideal leader: Experienced surgeon, extensive knowledge of trauma care, communicate clearly, radiate confidence	Small sample size

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Horwitz *et al.* [69] (2008) US	Survey with open-ended questions (264) Transcripts read by all research team membersSoftware used for coding	To identify vulnerabilities in the ED related to patient transfers	Grounded theory	ED house staff and physicians (39), hospitalists (21), internal medicine house staff (79) (Case study: Urban academic center)	Vulnerable areas include: Communication, environment, workload, information technology, patient flow, assignment of responsibility	Participants were not interviewed or observed. Recall bias. Single case study design. Selection bias
Jelinek, Weiland & Mackinlay [47] (2010) Australia	Semi-structured telephone survey with open-ended questions (95)	To determine the adequacy of supervision of junior medical staff and perceived feedback provided	Mixed methods Content analysis	ED Directors (61), registrars (19) and interns (15) (Multiple sites)	Most participants agreed that ED was adequately supervised but service demands had detrimental effects on supervision and feedback	Inter-rater reliability acceptable. Low participation by interns and emergency trainees. Survey instrument not validated
Jelinek, Weiland & Mackinlay [46] (2011) Australia	Semi-structured telephone interviews with open-ended questions (70)	To explore the preparedness of EDs for the increase in graduating interns	Content analysis	Registrars (15), interns (19), ED Directors (36) (Multiple sites)	Innovative models of managing the increasing numbers and improving the experience of interns in ED should be trialed	Acceptable inter-rater reliability
Kennedy *et al.* [49] (2007) Canada	Observations (216 hours) Interviews (88) Interviews were audio-recorded and transcribed Software used for coding	To develop a conceptual model of clinical supervision to inform and guide policy and research	Grounded theory	Observations: Members of EM and internal medicine teaching teams (12 teams) Interviews: Physicians (12), residents (44), medical students (24), and nurses (8). (2 sites: Academic hospitals/urban medical school)	Clinical oversight identified as a framework; activities include routine, responsive, and backstage oversight	Observer effect and transferability
Kennedy *et al.* [50] (2008) Canada	Phase 1: Non-participant observations (216 hours) Brief interviews (65) Phase 2: In depth-interviews (36) Field notes and interviews transcribed	Exploring context-specific assessment of trainees' competences for independent clinical work	Grounded theory Discourse analysis	Observations: EM and internal medicine teaching teams (12 teams) Interviews: Physicians (12), residents (28), medical students (17), and nurses (8) (3 sites: Teaching hospitals/urban medical school)	Trustworthiness of trainees to act independently involved: Knowledge, skill, discernment, conscientiousness and truthfulness. Assessment procedures used double-checks and language clues	Observer effect. Transferability. Selection bias
Kennedy *et al.* [51] (2009) Canada	Phase 1: Non-participant observations (216 hours) Brief interviews (65) Phase 2: In depth-interviews (36)	To develop a conceptual framework on medical trainees' decisions regarding clinical support	Grounded theory	Observations: EM and internal medicine teaching teams (12 teams) Interviews: EM and internal medicine physicians (31), residents (57), medical students (28), nurses (8) (3 sites: Teaching hospitals/urban medical school)	Medical trainees' decisions about to seek advice influenced by: clinical question (importance, scope of practice), supervisor factors (availability, approachability), trainee factors (skill, desire for independence, evaluation)	Observer effect. Transferability; data collected in teaching hospitals

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Kessler, Bradley & Badillo [74] (2012) US	Informal interviews/survey (38)/semi-structured group interview (1)	To evaluate and describe EM consultation process and to develop a framework for physician-to-physician communication	Grounded theory	Survey: EM and internal medicine physicians (38) Group interview: Physicians (4) (Case study: Urban tertiary, teaching hospital)	3 themes identified: Organizational skills, interpersonal and communication skills, medical knowledge	Sampling and researcher bias
Kilroy [48] (2006) UK	Semi-structured interviews (18)	To identify key features of effective clinical supervision in ED	Critical incident study Thematic analysis	EM consultants (18), trainees (10)	Quality care rely on: direct clinical supervision of key practical skills and management steps	None reported
Lamont [83] (2005) UK	Semi-structured interviews (21)	To explore key factors influencing the spread of the "See and Treat" tool	Grounded theory	Chief executives (5), clinicians (9), managers (7) (Multiple sites)	Reduced waiting time. Identified barriers to implementation: Quality and staff issues	Chosen EDs were using the tool. Selection bias
Lawrence et al. [70] (2008) US	Observations (1 year) Survey (31) Interviews (10)	To investigate change of shift handovers in ED	Grounded theory	Survey: Internal medicine and ED physicians and residents (21), nurses (6), paramedics (3) Interviews: Physicians (5), nurse (1), paramedics/technicians (5) (Case study: Urban Veteran affairs Medical Center)	Obstacles to smooth handovers relate to: Functions of ED (patient flow), operations, resources, professionalism, communication, clinical decision processes	Single case study design. Generalizability
Laxmisan et al. [84] (2007) US	Observations (3 months) Semi-structured interviews	To investigate the nature of multitasking and shift change and implications for patient safety in ED	Grounded theory	(Case study: Tertiary care, teaching hospital)	Effective functioning of ED rely on: Process of multitasking and process of patient flow	None reported
Mazzocato, Forsberg & Schwarz [85] (2011) Sweden	Structured observations (50 hours) Observation scheme Field notes transcribed	Explore the implementation of teamwork in ED	Mixed-methods	Physicians (interns, residents, specialists), nurses, and nurse assistants in ED (Case study)	Discrepancies between planned and observed behaviors identified	Observer presence bias Interpretation bias Single case study design
Murray et al. [60] (2011) Canada	Semi-structured interviews Online survey Audio-recordings transcribed Software used for coding	To determine gaps in knowledge, skill, and competencies of physicians caring for patients with AF	Mixed methods	Family (43), internal medicine (23), and EM (28) physicians, cardiologists (48) and neurologists (14) (Community-based settings)	Physicians self-reported suboptimal skills and confidence to treat AF have the potential for serious consequences	Self-report and self-selection bias
Nugus [87] (2010) Australia	Semi-structured observations (234 hours) Semi-structured interviews (56) Interviews transcribed	To examine the relationship between clinical quality and organizational efficiency in ED.	Ethnography	Doctors (6) and nurses (6) (2 sites: Tertiary referral hospitals)	Seniority and experience of EM clinicians intersect with the functions of role-modeling, performance management, formal and informal learning	None reported
Nugus [86] (2011) Australia	Direct observations (1600 hours/12 months) Informal interviews	Analyze how EM clinicians manage work pressure to maximize patient flow	Ethnography Content analysis	12 clinicians (EM medicine and nursing staff) (2 sites: Tertiary referral hospitals)	Processes and skills of staff to deal with external pressures are inherently organizational	None reported

Continued

Nugus [88] (2011) Australia	Observations (1600 hours/12 months) Observations transcribed	To examine the processes inside and outside the ED that impact on the work of ED staff	Ethnography Content analysis	12 clinicians (EM medicine and nursing staff) (2 sites: Tertiary referral hospitals)	5 themes identified: Dynamic flow, controlling flow, managing section boundaries within the ED, managing time, and external dynamics	2 sites Observer bias
Paltridge, Dent & Weiland [55] (2008) Australia	Survey (260) Grouped qualitative responses	To determine confidence and gaps in confidence perceived by fellows in ED for the planning of future educational interventions for EP	-	Fellows (260)	Fellows in EM reported being confident for most clinical tasks required of them minus: Neonatology, ultrasound, advanced airway skills, and eye emergencies. Data used as a framework for developing future CPD in EM	Self-rating of competence
Paltridge, Dent & Weiland [54] (2008) Australia	Survey (260) Grouped qualitative responses	To determine the barriers to continuous professional development perceived by fellows in EM	-	Fellows (260)	The most significant barriers were: Time, staffing levels, service-requirements, personal and family commitments	None reported
Schenkel et al. [57] (2003) US	Semi-structured case interviews (26) Interviews transcribed	To evaluate issues relating to patient risk and medical error in ED	Thematic analysis	Residents (medical, surgical, obstetrician) (26)	Limited documentation of mishaps. Mishaps related to misdiagnosis	
Schubert et al. [56] (2012) US	Semi-structured interviews (11)	To characterize cognitive differences between novice and expert physicians in ED	Thematic analysis	Physicians (11) (Case study: Level 1 trauma center)	Key cognitive processes relate to: Overview, sense-making skills, anticipation, managing time and complexity, team monitoring and management, interprofessional communication, self-awareness	Small sample size, single case study design
Smith et al. [61] (2009) US	Focus group interviews (3) Interviews audio-recorded and transcribed	To explore attitudes, experiences, and beliefs of emergency providers about palliative care	Grounded theory	Residents (10), physicians (4), nurses (6), social workers (2) and technicians (4) (2 sites: 2 academic EDs)	Palliative care themes identified: End of life care, feasibility and desirability, role of family members, lack of communication, conflicts around withholding end-of-life symptoms and inadequate training	Small sample size. Selection bias
Short et al. [58] (2009) Australia	Survey (67) Individual interviews Focus group interviews (4) Interviews transcribed verbatim Software used for coding	To investigate current re-search capacity in ED	Mixed methods	Survey: Medical staff (28), nurses (33), allied health (6)	Interdisciplinary and teamwork strategies needed to improve communication, skills mentorships and research support	Selection bias. Low response rate (survey)
Stone et al. [62] (2011) US	Semi-structured interviews (24) Software used for coding	To investigate EM physicians' perspectives on palliative care	Grounded theory	Residents (12), physicians (12) (Case study: Urban academic center)	Barriers to palliative care: Environmental or organizational, lack of training, cultural barriers	Selection bias

Continued

Terrell & Miller [73] (2011) US	Structured focus group interviews (2) Interviews recorded and transcribed verbatimBoth researchers coded	To identify solutions to improve care transitions between nursing homes and ED	Thematic analysis	ED nurses and physicians (4), Nursing home nurses and physicians (4), EM paramedics and technicians (5), administrators and managers (3)	Participants advised: A transfer form and a checklist, and verbal handoffs	Sampling and moderator bias
Thurgur et al. [43] (2005) Canada	Focus group interviews (5) Interviews recorded and transcribed	To determine what EM learners consider to be good prerequisites and strategies for effective teaching in ED	Grounded theory	Residents (28) and physicians in EM and medical students (4) (Multiple sites: Ontario medical schools)	Identification of 14 principles for good EM teaching. Top 5: Positive teacher attitude, takes time to teach, uses teachable moments well, tailors teaching to the learner, gives appropriate feedback	Small sampling sizeMixing senior and juniors might have had an adverse effect on what participants said. Trainee perceptions were investigated, not effective teaching practices
Toma et al. [82] (2010) Canada	Semi-structured Interviews (21) Interviews transcribed verbatim	To identify barriers to implementation of therapeutic hypothermia for survivors of cardiacarrest	Content analysis	Physicians EM (7), ICU (4), nurses (10) (Multiple sites)	Adoption of an intervention was met with generic, local and individual barriers: Lack of familiarity with protocol, of interprofessional education and collaboration, availability and cost of equipment, workload, infrequent procedure	Sampling bias
Tye & Ross [76] (2000) UK	Semi-structured interviews (9) Interviews audio-recorded and transcribed	Professional perspectives of the emergency nurse practitioner role in ED	Content analysis	Consultants (2), senior house officer (1) nurses (3), manager (1), Director (1), Chief executive (1) (Case study: South East UK)	Consensus of improved waiting times and patient satisfaction. Ambivalence concerning current role figuration, value for money, professional identity	Small sample size
Wears & Perry [71] (2010) US and Canada	Ethnographic observations (Minimum 2 at each site) Handoffs audio-recorded and transcribed Handoff assessment tool	To explore handoff communications in ED	Discourse analysis	ED workers (4 sites)	Tool: Poor fit to ED	None reported
Xiao et al. [79] (2004) US	Video observations (152 videos/3 months)	To investigate the functions of team leadership in trauma resuscitation	Grounded theory	Trauma teams (18) (Case study: Level 1 trauma center)	6 leadership functions identified: Strategic planning, reporting and critique of plans, coaching, maintaining awareness, and information requests	Sampling bias

4.3. Action Research

Action research aims at changing a social practice and not only describing it. The people studied by action researchers are conceived of as participants and action research is concerned with these people or their practice not a study about their behavior. Action research aims at formulating theories and solutions that change people's lives. It is putting theory to the use in the real world [23, 24]. Participation is fundamental in action research. Action researchers work explicitly with and for the participants, by changing processes and monitoring the effects of the changes, and reflecting on the process and implications for social theory and practice. Examples of

Table 2. Advantages and disadvantages of the qualitative strategies of inquiry.

	Advantages	Disadvantages
Ethnography	• Explorative • Capable of producing rich or thick descriptions about human behavior; *i.e.* of how people in a culture enact as social practice and produce meaning	• Time-consuming; ethnography builds on a prolonged stay • Difficult to train, supervision and preparation is needed • Requires: People skills and participant observation as a reflexive approach
Mixed methods	• Might get the generalizing power of quantitative research with the full picture of qualitative methods	• Time-consuming • Requires acquaintance with both qualitative and quantitative paradigms • An novel approach not yet unified or agreed upon
Action research	• Addresses a social problem • Introduces a social intervention for the betterment of a social ailment	• Time-consuming • Difficult to train since the action researcher must understand, intervene and evaluate change
Grounded theory	• Links theory closely with data • Inductive theory building • Works well with comparison methods used in computer programs for qualitative analysis	• Time-consuming • Can be unclear what role prior theory should play for the grounded theory
Phenomenology	• Often delves deep into a limited amount of research interviews that are scrutinized in terms of how a conscious experience is understood by subject or should be understood in terms of the essence of this experience	• Requires acquaintance with phenomenological philosophy partly due to lack of detailed guidance for analysis • In practice, the few interviews analyzed can be a drawback
Content analysis	• A descriptive method • Focus on data rather than on a preconceived philosophical orientation • Data analysis amenable to quantification	• Guidelines for data analysis have been hard to establish, apart from advice to emerge oneself in the data, rereading and continually revisiting the data categories
Discourse analysis	• Studies speech as action and thus can achieve ecological validity and genuine knowledge about subjects' meaning making	• Requires the researcher to know a rather broad array of linguistic, psychological and philosophical literature
Critical incident analysis	• Allows through focus on unusual situations rather than routine data an analysis of why (difficult to analyze) problems occur.	• Might overlook everyday situations and situations that happened long time ago • People might underreport critical incidents if this conflicts with their own interests

action research could include creating an improved ED learning environment or creating effects where participants' action and reflection enhance and develop into spirals of positive change [25].

4.4. Grounded Theory

Grounded theory was developed by sociologists Glaser and Strauss [26] and further developed by Charmaz who described grounded theory as a set of methods that "consist of systematic, yet flexible guidelines for collecting and analyzing qualitative data to construct theories "grounded" in the data themselves" (p. 2) [27]. Grounded theory aims at developing theories or higher levels of understanding that are grounded in data; *i.e.* derived from a systematic analysis of data [22]. Grounded theory relies on an interpretive and iterative study design with theoretical sampling and constant comparisons of new and previously collected data [28,29]. A grounded theory study

use these features to allow for the emergence of new conceptual models that extend beyond conventional thinking [30].

4.5. Phenomenology

Phenomenology as a qualitative research strategy is about the meaning of lived experience. This lived experience is traditionally studied through personal interviews with the subjects whose experience is in question. However, the experience of the researcher also becomes important. Phenomenological research pays attention to the structure of experience, what subjects reflect about their experiences and what the phenomenological analysis yields significant aspects of human experience [31]. In phenomenological research data analysis, recordings and transcriptions are approached with openness to whatever meanings emerge. This is an essential step in following the phenomenological reduction necessary to elicit the

units of general meaning. The process of analysis proceeds by bracketing, the researcher's preconceived meanings and interpretations without theoretical presuppositions [32]. This involves for the researcher to become aware of his or her own preconceptions about the phenomenon under study. The aim of analysis is to derive at the essence of a phenomena, for instance what is the essence of EM experiences empathy in the ED.

4.6. Content Analysis and thematic Analysis

Traditionally content analysis was used for quantitative purposes such as word frequencies. But when content analysis is used as a qualitative strategy of inquiry it refers to a form of thematic analysis. As a qualitative strategy of inquiry, content analysis is defined as "a research method for the subjective interpretation of the content of data through the systematic classification process of coding and identifying themes or patterns" [33]. In qualitative content analysis the researchers familiarize themselves with the data and search for underlying themes through coding that either arises from the research literature or from the data collected [34]. Qualitative content analysis has in recent years been developed into something called thematic analysis [35], which this study for the sake of brevity in this literature review will classify as content analysis. Thematic analysis and content analysis are both concerned with deriving at and analyzing themes defined as patterns of meaning.

4.7. Discourse Analysis

In discourse analysis the researcher investigates language-use as a social act. Discourse analysis aims to study how speech, text or some other talk is practiced and regulated as social phenomena [36]. The focus is often on naturally occurring talk since the object of analysis is how language is used within a social practice, for instance by health professionals in the ED/EM context. A researcher working within a discourse analytic tradition might ask: How is the EM field organized in terms of talk about what physicians do, why they do it, and what they hold as valuable? Data for discourse analysis might be text, gestures, words, but only to the extent that these cues offer evidence about how the social world is construed through discourse [37]. An important theme in discourse analysis is the intricate relationship between power and knowledge, in other words how discourse might be hegemonic.

4.8. The Critical Incident Technique

The critical incident technique was developed by Flanagan (1954) and provides a research-based approach for the investigation and analysis of clinical incidents to improve patient safety. In medical education, critical inci-

dent reports are being used to facilitate reflective learning [38]. This technique consists of a set of procedures for collecting direct observations of human behavior and observed incidents having special significance in such a way to facilitate their potential usefulness in solving practical problems [39]. The technique can proceed by interviewing experts through individual or group interviews about critical incidents, but questionnaires are also used. Also observations by trained observers observing how somebody perform the work under study, is a used strategy of data collection. As part of the critical incident technique, the collected data is analyzed through a process of categorization schemes or comprehensive summaries [40].

5. Results

46 articles were included in this literature review and they are listed in **Table 1**. They were published between 1999 and 2011. This review found eight different quailtative strategies of inquiry in EM. The included studies were categorized into four themes and 12 sub-themes presented in **Table 3**. These themes were derived inductively; *i.e.* obtained gradually from the data. The four themes are: Education and training, communication, professsional roles, and organizational factors. All studies were classified, yet with several studies overlapping themes and sub-themes.

5.1. Theme 1: Education and training

Teaching Strategies
Studies used a number of contemporary learning theories including situated learning theory and chaos theory to understand EM physicians' workplace learning [41,42]. In a phenomenological study, the Goldman group found major differences in residents' learning strategies used to learn clinical skills versus learning leadership skills. They found, that clinical skill learning was approached with rigour and involved physicians, while leadership skill learning was unplanned and largely relied on nursing staff [42]. Thurgur found that EM medical staff had consistent views about good EM teaching strategies [43]. In a survey study, twelve specific teaching strategies for ED teaching were identified, for instance to actively involve the learner, the importance of the learning situation etc. [44] These findings are aligned with literature on medical education [45] and therefore one could argue they are not specific to ED teaching.

Supervision and feedback were pointed to as important to the education of ED junior staff [46-48]. Jelinek *et al.* call for a specific ED clinical intern supervisor [47]. In a series of grounded theory studies, Kennedy, Lingard and co-researchers explored the interrelationship between supervision, requests for clinical support and patient safety [49-51]. They found that, besides a simple clinical skill

Table 3. Themes and sub-themes.

Theme	Sub-theme	Study
Education and training	• Teaching strategies • Supervision and feedback • Competency-based assessment • Simulation • Needs assessment	[41-44,46-55,57-60,62-64,70,72,75,87]
Communication	• Handoff • Inter-departmental transfer • Consultation	[51,56,60,61,66,68,69,71,73,74,77,79-81,84-86,88,103]
Professional roles	• Team roles • Leadership	[51,56-58,60-62,70,74-76,78-80,86-88,104]
Work organizational factors	• Organizational change and barriers • Work and patient flow	[46,47,54,57,68-73,76-81,83-88]

assessment, supervising physicians also assessed the trust worthiness of trainees to act independently. Trust-worthiness involved knowledge and skill, discernment, conscientiousness, and truthfulness [50]. Trainees' decisions about whether or not to seek clinical support were found to be a multifaceted and uncertain process influencing patient safety [51]. Some studies investigated competency based assessment [52,53] and areas where the resident training program can be improved. Two studies investigated EM physicians' educational needs and barriers to continuing medical education in ED [54,55].

Several studies carried out educational needs assessments. Effective teaching and training methods should be targeting cognitive skills and differences in expertise in junior EM staff [56]. Medical error in the ED was studied from residents' perspectives in terms of medical mishaps such as misdiagnosis [57]. Residents held the ED environment and the need for more knowledge and training responsible for medical errors. Another topic in ED was the need to develop staff's research skills [55,58]. Some studies only had emergency medicine physicians as a peripheral research focus. These studies focused instead on educational needs assessments related to specific medical topics such as management of child abuse [59], atrial fibrillation [60], and palliative care [61,62].

Two studies investigated simulation practice and debriefing strategies in EM and highlighted the importance of reflection on mistakes and the need for cognitive feedback to ensure sound decision making [63,64].

5.2. Theme 2: Communication

The reviewed studies, in accordance with the patient safety literature [65], single out handoff communication as an important field of investigation [66-71]. These studies point especially to problems pertaining to insufficient information [66,67] and to a lack of assignment of responsibility [69]. One study developed a template for

studying clinical handover in trauma teams [72]. Another related problem to handoffs was interdepartmental transfer oftenresulting in communication breakdowns [73]. These communication errors were caused by conflicting expectations between hospitalists and EM physicians concerning patient diagnosis [66]. The quality of physician-to-physician-consultation in ED was found to depend on interpersonal, clinical, communicational and organizationnal skills [74]. Eisenberg *et al.* [68] explored the relationship between EM communication and patient safety. They identified four routine communication processes crucial in determining both the direction and quality of care, and the risk of adverse events. A communication perspective of work in the ED depicts a combination of technical and narrative rationality that is not limited to a field dominated by logic and objectivity.

5.3. Theme 3: Professional Roles

Interestingly, one study identified blurring of roles as positive for collaboration [75] where as another study identified blurring role boundaries problematic and related to professional identity [76]. The relationship between team roles and stress was investigated [77]. Health professionals considered leadership and attitudes as important subthemes for functioning teams. In the trauma team, Hjortdahl [78] found that the trauma team leader should be an experienced surgeon who exhibits confidence. Via video analysis of trauma teams, Xiao [79] developed a catalogue of six leadership functions.

5.4. Theme 4: Work Organizational Factors

One study investigated organizational change and identified a mixture of national and regional policy factors as influencing trauma care [80]. An action research study aimed through studying the organizing practices in ED to change these practices to develop more efficient responses [81]. Individual and local barriers to implement-

tation of a therapeutic intervention were identified (hypothermia for resuscitated cardiac arrest) [82].

Work and patient flow: Some studies aimed to reduce waiting time [83]. Handover strategies were linked to the functions of the ED and this organizational context such as resources, patient flow, operations, professionalism, clinical decision processes and communication [70]. Some studies investigated workflow, team organization, and the multitasking of ED clinicians as important for patient safety [84,85]. In a series of studies, Nugus and colleagues [86-88] explored the interdependence of work flow and work pressure, the dichotomy of quality and effectiveness of patient care, and the inter-departmental context of ED. They found teamwork essential to patient flow. It was emphasized that ED staff strive for quality over efficiency in practice; *i.e.* pointing to the fact that staff was concerned with quality and work flow, namely how patient trajectories are made up by messy or complex networks of boundary work and the necessity for integrated care [87].

6. Discussion

6.1. Different Approaches

Qualitative research refers to a plethora of distinct strategies of inquiry, methods and philosophical approaches. But all qualitative studies should include clear descriptions of how they were conducted, including the selection of the study sample, the data collection methods, and the analysis process [9]. The point is that qualitative research can be assessed in terms of the degree to which it generates theory, is empirically grounded, scientifically credible, transferable to other settings, and internally reflexive with regard to the roles played by the researcher and participants [89,90]. Qualitative research might be undertaken to test a theory (deductive research) or to develop a theory (inductive). Clearly qualitative research can be explorative but good qualitative research still needs a research question either inductively or deductively. Qualitative research often emphasizes an inductive-subjective-contextual approach rather than a deductive-objective-generalizing approach [22].

6.2. Evaluation of the Quality of Qualitative Studies

Methods for literature reviews are well developed for trials, but not for qualitative research [91,92]. Systematic reviews apply explicit methods to this task, such as comprehensive literature searching and the quality assessment of studies.

In this review, the variation and inconsistencies in methods, terminology and selection of participants presented a number of challenges when the authors tried to apply any systematic analysis of the quality of the included papers. In the absence of consensus about standards for the evaluation of qualitative research, there is a danger that qualitative research results are misunderstood and judged inferior by those whose field of vision is firmly fixed on a hierarchy of evidence that makes randomized control trials the gold standard. But the fact that qualitative research is not a single unified approach to inquiry does not imply that it is a collection of unrelated practices, or that there are no relationships to practices of quantitative research. As this review shows, qualitative research relies on different traditions some of which are relatively well-confined and certainly well-defined in the literature [93].

Evaluation of qualitative research implies assessing the knowledge claims and the communication and contextualization of research findings [94]. Analyzing quailtative data is not a simple or quick process. Done properly, it is systematic, rigorous, labour- and time- consuming [95]. To establish rigour, *i.e.* validity and reliability [96] and to consider transferability, it is important for the reader to know which kinds of observations were carried out (direct, video, or participant observation), which interview techniques were used, for how long and by whom? The inductive nature of qualitative research requires sampling to the point of saturation, *i.e.* the researcher continues to recruit participants until no new data emerge [8]. Although the idea of saturation is helpful at the conceptual level, it provides little practical guidance for estimating sampling size, prior to data collection, necessary for conducting quality research. Much has been written about handling heterogeneity in quantitative systematic reviews but perhaps the importance of addressing heterogeneity in qualitative reviews in EM has been underestimated [97].

Several studies in this review discussed the selection of the emergency setting and the health professionals in terms of information bias or sampling bias [59,66,72, 74,98]. But in qualitative research, it is important to recognize that observer bias cannot be completely avoided. In phenomenology for instance, this problem is tackled through bracketing. But the point is that in all qualitative research, data is generated by people and people are part of power-discourses [36,50], e.g. action researchers [81] perform their research in close collaboration with participants, ethnography relies on researchers participating with people. In other words, observer bias is not a problem in qualitative research but a strategy.

A key question in qualitative research is: How the research moves from a description of data, through quotations or examples, to an analysis and interpretation of the meaning and significance of it? Though a journal article is commonly subjected to tight word limits, the reader should be able to decipher the views and analysis under-

taken by the researcher from the description of the setting, and the interactions and accounts given by those who have been studied. In this review study, inter-observer reliability were discussed [44,46,63,67], *i.e.* the point that more than one researcher coded and read transcripts.

How does qualitative research contribute to a richer conceptualization of EM? Nugus and Braithwaite [87] showed that physicians negotiate quality and efficiency and thus showed how they make accountability a part of their day-to-day work.

"*The study was a live window into the culture being socially produced through the behaviors of participants endeavoring to reconcile quality of care with efficient practice in a microcosm of the health system. The study showed that the mutual enactment of efficiency and quality generates and is generated by shared cultural definitions of the situation and guides the way care is organized and delivered by senior and junior staff*" (p. 516) [87].

Thus by studying a situated practice a good ethnographic study might be able to provide an important glimpse into why and how people enact EM practices. As Nugus and Forero[88] argue, often research has already shown that something is the case (hand-off communication leads to medical errors, interdepartmental communication is difficult, other departments influence ED practice, etc.) but good qualitative research can provide an answer as to why this is the case. Other strength of qualitative research is its ability to grasp and operationalize complex relations. For instance, Kennedy and Lingaard and colleagues demonstrate the intricate relations between supervision and clinical support [49-51]. In studying competence assessment and its tacit dimensions the researchers are able to not only describe supervision but develop a clinical oversight typology.

While some studies employed long-time ethnography [53,68,70,79,81,86,88], e.g., more than fifty interviews before data saturation [49-51,87], and moved iteratively between theory construction and data analysis, other studies were not as thorough. Qualitative research is not a simple add-on to an evaluation study. While it is not difficult to conduct an interview or observe EM physicians, it takes research training and great acquaintance with the rather substantive qualitative research literature to make quality research. The distinctive contribution made by qualitative research in EM with regard to well conducted research, rigorous study design, the iterative research process and its management of data, systematic analysis and findings needs further attention. The importance of using qualitative research in EM can hardly be exaggerated. Use of qualitative research might contribute to a reconceptualization of emergency medicine practice. *Strengths and limitations of the review*

Qualitative studies can be difficult to search for and identify due to current methods for indexing qualitative research in bibliographic databases [99]. It is possible that the inclusion criteria may have been too narrow leading to under inclusion of other studies that are potentially relevant to EM and ED. The exclusion of studies involving solely non-physician providers may also contribute to under inclusion. But the goal of this review was to focus attention on qualitative research related to practicing EM physicians in the ED. However, the explicit search strategy in two databases, clear inclusion criteria, and systematic process used to identify and evaluate articles strengthen the quality of this literature review [100]. Nevertheless, the large volume of false hits, indicate that the fit between the search criteria and the relevant literature was less than perfect. Finally, all the reviewed studies were in English and this probably reflects a selection bias.

6.3. Future Studies

Although field observation, interviews and other qualitative methods can provide a range of interesting and insightful information concerning the organization of health care, it is widely recognized that medical practice is systematically accomplished through interactions of different health practitioners. These interactions are multimodal in that they rely upon the interplay of talk and coordination, as well as visual and material conduct. Future studies might use video, accompanied by a relevant methodological framework to provide the resources enabling us to begin to explicate and inform the practicalities of medical work in EM [101,102]. Mixed methods, in particular video observational studies might fill a gap in terms of understanding the meaning of specific communication interactions and link team performance to patient outcome.

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