

Blood, Sweat and Tears: Making Sense of Senses in Expert Nursing

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Abstract

In this article, I draw on material from an ethnographic and phenomenological study of knowledge and professionalism among registered nurses working in a cancer unit at a Norwegian hospital. During the study, the use of the senses stood out as an important skill in nurses' work with patients. The question to be investigated in this article is how the nurses acquire and use sensory knowledge in their clinical work. Building on a notion of knowledge as situated, embodied and sensory, and learning as embedded in doing, this article contributes to and expands on the study of sensory knowledge in two respects. First, it foregrounds the processes and practices in which sensory knowledge is actually formed and used at a micro-level. Second, it highlights how an ethnographic and phenomenological exploration of the acquisition and use of sensory knowledge can contribute new insights into how expertise is cultivated in everyday clinical practice. [Sensory knowledge, expertise, nursing, cancer phenomenology]

Introduction

The nurse enters the patient's room. It is quiet; the television is turned off, the room is tidy, lightened up by the window that covers most of the wall opposite the entrance. "Good morning, sorry for disturbing you. I'm just going to take some measurements and give you your morning medication," she says, approaching the patient, looking at her and touching her forehead with her palm. "How are you feeling today?" She gives the patient a comforting smile.

This paper draws on material from an anthropological study of knowledge and professionalism among registered nurses working in a hospital cancer unit in Norway. The unit represents a clinical context where nurses' knowledge is essential in addressing patients' complex needs. Cancer patients need to be rigorously monitored. Chemotherapy and stem cell transplantation break down the body's immune defense system, providing poor protection from infections, indicated by changes in temperature, pulse, respiration, blood pressure, or pain. Nurses hold the main responsibility for maintaining frequent observation and measurements of the patients' overall medical condition and well-being. This is partly accomplished by looking at, feeling, smelling, listening and talking to their patients. Thus, during the study, the use of the senses stood out as an important skill that the nurses depend on in their everyday care of patients. How, then do nurses acquire and use sensory knowledge in their clinical work?

To answer this question, this study explores nurses' work with patients from an ethnographic and phenomenological standpoint. This enables an analysis of how sensory knowledge is formed and applied in everyday practices and social processes in the cancer unit. In this article, I argue that the acquisition and use of sensory knowledge involves complex interplay between different forms of knowing, ways of sensing, and modes of learning and communicating sensory knowledge. Furthermore, I claim that the ethnographic and phenomenological approach enables the study to demonstrate how the interdependence between these different types of knowledge is established in nurses' intersubjective, embodied and sensory work with patients, which is therefore crucial to the continuous cultivation of their clinical knowledge and expertise.

Such insights can enhance awareness of a type of knowledge often marginalized in a hospital context, which is increasingly being dominated by a biomedical knowledge regime, reconfiguring professional identities and practice work (Charles-Jones, Latimer, and May 2003). Thus, management control mechanisms that has been introduced to meet challenges

threatening the healthcare systems in western countries, has been linked to an erosion of professional autonomy, changing the nature of medical professionalism (Numerato, Salvatore, and Fattore 2012, Harrison and Ahmad 2000). These changes in the control and governance of clinical practice, involving the introduction of new technology, also structures the nurses' work with patients affecting processes that are essential to the building of sensory skills. To patients, these skills can ultimately become a matter of life and death. The role of sensory knowledge in the cultivation of clinical expertise is therefore a crucial area to study.

The article first presents two models for understanding knowledge and learning, as a basis for outlining how senses will be conceptualized as knowledge and related to expertise in this study. Then follows a presentation of the study's methodology, the research methods applied, and the hospital as field site. I then present the analysis, describing situations where sensory knowledge played an essential role, and conversations with nurses about how they acquired and used sensory knowledge in clinical practice. Finally, I discuss the complex and multifaceted processes involved in trying to make sense of sensory inputs. In this section, I will also discuss implications of the ethnographic and phenomenological approach to the findings, and briefly suggest this study's broader implications for the study of professional knowledge and expertise, and the role of sensory work in changing healthcare environments.

Knowledge, Senses and Expertise

Theoretical, abstract and formally learned knowledge has been privileged as the primary and most reliable form of knowledge in western thought. This involves a model for understanding the relationship between practical and theoretical knowledge where the former is seen as the application of the latter (Grimen 2008). Learning, then takes place through the acquisition of context-free and propositional knowledge, available for transmission by teaching outside the context of use, and is separated from doing (Ingold 2011 [2000], 416). This perspective on knowledge has been dominating within strands of the sociology of professions, where abstract knowledge acquired through higher education is regarded essential in defining professionalism, fundamental to professional autonomy and the solving of expert tasks (Abbott 1988, Parsons and Platt 1973, Freidson 2001). Within a hospital context, the prevalence of evidence-based medicine (EBM) also bears elements of this way of reasoning about the relationship between theory and practice, with randomized controlled trials (RCT)

ranking highest as the golden standard (Timmermans and Berg 2003). According to Lambert, Gordon, and Bogdan-Lovis (2006, 2613): "evidence-based approaches have come to play an increasingly important role in many national health systems, not only in guiding clinical practice but also in shaping research agendas, formulating policy and allocating financial resources".

Other conceptualizations of knowledge and learning have contested this privileging of theoretical over practical and embodied ways of knowing, claiming that the ability "to do something", in contrast to "knowing that something is", is also knowledge (Ryle 1963). Thus, theoretical knowledge is seen as inseparable and arising from practical knowledge (Schön 1983, Dreyfus and Dreyfus 1986, Benner 1984). According to Grimen (2008), practical knowledge is "indexed", i.e. inseparable from the person who holds it or the situations in which it is used. It has tacit dimensions and includes embodied skills that may be difficult to put into words (Polanyi and Sen 2009 [1966]). Within these perspectives, learning is contingent on its connectedness, historically and with others (Wenger 1998). It needs to be understood as what Lave (1990) calls "understanding in practice". Thus, learning is a process of "enskilment", inseparable from doing, and both are embedded in a context of practical engagement in the world (Ingold 2011 [2000], 416).

Investigating senses as knowledge is dependent on such a broadened understanding of the scope of knowledge, as know-how, indexed and hence personal, embodied, and sometimes tacit, and a notion of learning as doing. Yet this does not imply that knowledge necessarily become private in any individual sense (Barth 2002). Every person's knowledge, Barth claims, is constructed within the traditions of knowledge of which each of use partakes, and personal skills and embodied knowledge are largely constituted on the bases of activity into which the person has been socialised. Exploring knowledge, we need to investigate the particulars of action in which knowledge is realised and applied, paying attention to the agency and acts of knowers, and how substantive ideas, representations and communication of knowledge mutually determine each other, in addition to being restricted by material circumstances and relations of power and disempowerment (Barth 2002).

Drawing on these conceptualizations of knowledge in the exploration of how nurses acquire and use their senses in everyday clinical practice, this article contributes to the study of sensory knowledge and expertise in two respects. First, it foregrounds the processes and

practices in which sensory knowledge is actually formed and used at a micro-level. The connection between senses and knowledge is not new. The anthropology of the senses, represented by the work of Howes (1991) and Classen (1993, 1997), has highlighted how senses can be seen as foundational knowledge that structures and facilitates thought at a societal level (Maslen 2015). However, according to Maslen (2015) few studies have explored how senses are actually formed and come to act, i.e. how sensory knowledge is acquired and used. Aiming to fill this gap Maslen has investigated how doctors learn to hear medically (Maslen 2015), and the nature and role of diagnostic sensory work in the meeting with new management regimes and techno-scientific changes in healthcare environments (Maslen 2016, 2017). In the discussion, I will argue that her conclusions are relevant to the study of how the senses are cultivated and used also among nurses, who are frequently being delegated the role of making sensory judgements on behalf of physicians (Oudshoorn 2008, 2009). Drawing on Maslen's work I claim that building sensory knowledge involves a complex interdependence between different types of knowledge, constituted in the nurses' continuous interaction with people and technologies in the clinical environment.

Second, the article highlights how a phenomenological and ethnographic exploration of the acquisition and use of sensory knowledge can contribute valuable insights into how expertise is cultivated in everyday clinical practice. According to Lawlor and Solomon (2017), numerous studies have examined the role of guided participation and apprenticeship, involving various forms of novice-expert interaction, in establishing expertise. However, anthropology has focused little on the cultivation and spread of expertise, particularly from an ethnographic and phenomenological standpoint (Lawlor and Solomon 2017). Within anthropology expertise is understood as inherently interactional, involving the participation of objects, producers and consumers of knowledge, enacted in real-time communicative practice (Carr 2010). Contemporary developments in the expert literature emphasize that expert decision-making is an intuitive competence, rather than rational, based on logical knowledge and ability (Collins and Evans 2007). Combining a phenomenological and ethnographic approach in the study of sensory knowledge and expertise, this study aims to demonstrate how nurses' expertise is cultivated in continuous, embodied, sensory and intersubjective relations, in the doing of nursing.

Methodology and Research

Phenomenological methods have been considered of great utility to anthropological inquiries over the past three decades, grounding theories, descriptions and analysis in examination of peoples' lived experiences and concrete bodily experiences, forms of knowledge and practice. This has made phenomenological anthropologist prone to one of the main critiques of phenomenology, namely that it ignores broader structural, social and historical influences, focusing only on the subjective and experiential (Desjarlais and Throop 2011). The phenomenological focus on the "subject body" (Jackson 1989) and embodiment, pursuing "how the world is felt and experienced from a first person point of view" (Hollan 2012, 37), does however not imply taking the individual as an isolated and self-contained object of scrutiny as the point of departure. Rather, it contains that even our most basic experiences entail a foundational intersubjectivity, i.e. thinking, perceiving, remembering and learning are fashioned in the ongoing relations with others and the environment, and need to be studied within the political and cultural context where people's practical involvement with the lived-in world takes place (Jackson 1998, Ingold 2011 [2000], 171, Desjarlais and Throop 2011).

Thus, the critique of phenomenological methods can be counteracted in the "convergence" between phenomenology and ethnography, i.e. using phenomenological method, concepts or sensibilities in the interpretation of ethnographic data, or ethnographic data as basis for phenomenological reflection (Csordas 2012). This convergence has implications for ethnographic practice, which consequently must entail multisensorial embodied engagement with others and with their social, material, discursive and sensory environments.

Furthermore, it requires critical reflection on these engagements (Pink 2015, 28).

Paul Stoller (1989, 1997), promoted the reflexive and embodied turn in social theory, arguing that anthropologists should not only consider the multisensory experience of others, but also attend to their own senses, and thereby produce evocative and tasteful ethnographies. Linking Merleau-Ponty's phenomenology of perception with the practice theory of Pierre Bourdieu, Csordas (1990) outlined embodiment as a methodological orientation, a paradigm, for anthropological empirical research, taking the body as a productive starting point for analyzing culture and self. He introduced the notion of "somatic modes of attention" to describe "the culturally embodied ways of attending to and with one's body in surroundings that include the embodied presence of others" (Csordas 1993, 138).

According to Ingold (2011 [2000]), the fact that sociality is given from the start, in the direct, perceptual involvement of fellow participants in a shared environment, is what makes anthropological fieldwork possible. It allows the fieldworker and local people to inhabit a common ground of experience. Because people make sense of their experiences by constructing a narrative based on strands of practical, perceptual activity, understanding of meaning production must start from the processes of social life, with how people sense the world. Participant observation allows the ethnographer to access other people's ways of perceiving by joining with them in the same currents of practical activity, learning to attend to necessary tasks, as would any novice practitioner. This communion of experiences establishes a baseline of sociality for all subsequent attempts at verbal communication (Ingold 2011, 314).

Guided by these methodological perspectives, my fieldwork involved drawing on sensory and embodied knowledge, attending *to* bodily sensations as a mode of attending to the intersubjective milieu of the cancer unit that caused these sensations and thus paying attention *with* my body (Csordas 1990). I accessed the nurses' ways of perceiving by joining them in their practical work, learning to attend to what they attended to and engaging in talk to make sense of our shared experiences. This involved aiming for an understanding that was "as loyal as possible to the contexts, the embodied, sensory and affective experiences, and the negotiations and intersubjectivities through which the knowledge was produced" (Pink 2013, 35).

The Fieldwork

The study involved participant observation and ethnographic interviews (Spradley 1979) during five months from January-June 2017. The 40 fieldwork sessions involved participating in the nurses' activities on different shifts, and in addition I attended compulsory courses for hospital employees, and internal seminars at the ward. During the observations I was dressed in white, with a name tag stating that I was a researcher. As nurses are mainly attached to one cluster (unit within a ward), with its typical patient profile, I observed and participated in each of the three clusters. Attending different shifts provided access to varied situations involving nurses' interaction with fellow nurses, patients and other clinicians. The nurses who participated in the study was selected by snowball sampling after an initial introduction to two of the nurses from the Senior Charge Nurse at the outset of the study. All of the nurses

working at the ward were informed about my role there, and none of the nurses I approached about participation refused to take part in the study.

The fieldwork evolved as a process of overlapping phases as outlined by Spradley (1980). Initially, I noted down nonspecific descriptive observations, aiming to grasp the complexity of the everyday ward activities, involving electronic recording of measurements and medication, writing and reading of nursing reports and notes, handover and pre-round meetings, rounds, oral reporting between nurses and other professionals, lunch-hour conversations, and nurse-patient encounters. As my familiarity with the routines increased, my observations became more focused, and my attention narrowed down to particular processes and practices. Repeated observations of selected situations involving the nurses' continuous monitoring and caring for their patients and informal talks with them about the knowledge needed in such encounters highlighted the importance of the use of the senses, thus focusing my attention further. Before explaining how I sensed my way into the hospital and the cancer unit, delimiting the field through the senses, I will describe the hospital and the cancer unit as a workplace to the nurses and an ethnographic field site to me as a researcher.

The Hospital and Cancer Unit as Field Site

In early hospital ethnography, hospitals were described as exotic places or “tight little islands” cutting their inhabitants off from normal life. Others have depicted the hospital as culturally embedded, a place invaded and shaped by values, rules and ideas of the outside world (Long, Hunter, and Van Der Geest 2008). Essential in both these approaches is the need to understand the complexity and multifaceted relationships that exist within the walls of the hospital or ward. In 1930, Michael Davis wrote that to the patients and their relatives, the hospital is a “battlefield between life and death, the focus of intense anxiety and hope”. To the physicians, however, it is “an institution for the practice of medicine and a central agency through which the study of disease is pursued, the boundaries of medical science widened, and medical skill increased” (Long, Hunter, and Van Der Geest 2008, 71).

Strauss et al. (1997) state that a useful way of conceiving of the hospital is as a large number of work sites, consisting of “variegated workshops”. On a cancer ward, some patients are dying, some are receiving radio- or chemotherapy to be cured, and all are suffering from side

effects of the disease or the treatment. In this working environment, nurses are providing medical and psychological care, doing “comfort work” (Strauss et al. 1997, 5-6). Heath and White (2008) have described nurses’ work with patients as “body work”, caring for patients in various ways to minimize the effects of illness and disability, and maximize health and independence. The tasks involved in comforting care and “body work” would appear to be accomplished in close interaction with, and sometimes involving mediation between, the battling patients and the medically oriented physicians.

The nature of such comfort care and “body work” are potentially being reconfigured within risk management systems that privilege abstract, biomedical forms of expertise over embodied ways of knowing, threatening to disconnect clinical relationships and de-humanize patients (Hillman et al. 2013, Pine 2011, Charles-Jones, Latimer, and May 2003). This is the case also in a Norwegian context. The hospital under study had recently been relocated and reorganized, involving an enhanced focus on patient safety and participation and increased use of information technology. Still, the neoliberal trends described to take place in countries like the US (Pine 2011) has not been as extreme in Norway, which is known for having one of the world’s most efficient welfare systems, involving free medical treatment. This, I claim makes a study of sensory knowledge among nurses in a Norwegian hospital an interesting case that might contribute to ongoing debates on hospital regulation and governance and the nature of “good” healthcare.

The hospital where the study has taken place is owned and financed by The Ministry of Health and Care Services, and has about 5000 employees and a catchment area of over 300 000 inhabitants. Like all other wards at the hospital, the physical outline and work processes in the cancer unit are organized into clusters, each serving nine single patient rooms. The three clusters of the cancer unit thus have a total of 27 patient rooms. Two clusters are reserved for oncology patients, one of which has the most severe cases and terminal patients in need of palliative care. Patients with hematological diseases are located in the third cluster. Although nurses were attached to one cluster, they all had to take shifts in the others when needed. At the time of the study, about 45 nurses worked in the unit, including two men. Nine were specialist nurses. The nurses that I observed were from 25 to 50 years old, with from two to 25 years’ experience, and had from 60 to 100% positions.

All Norwegian nurses have a bachelor's degree or an older equivalent in nursing from a university or university college. The cancer nursing specialization is a one-year full-time university course. Three of the ten nurses I observed and worked with had this qualification. The nurses reported having learnt basic theoretical knowledge about anatomy, physiology, pathology and pharmacology in their bachelor's program, while knowledge of cancer diagnoses, treatments and side effects, was mainly learnt in clinical practice in a cancer unit. Here, the theoretical knowledge only became meaningful through their clinical experience. I would therefore argue that this study is particularly suitable for investigating how expert knowledge is based in embodied, sensory experience and learning enmeshed in practice.

Delimiting the Field through the Senses

From the moment when I first entered the hospital, I used my senses to take in the atmosphere. My first fieldwork notes describe what I saw. The white walls, marked with colors on each elevator shaft: orange, purple, grey and green, indicating where in the building I was located. The staff in their white clothes rushing through the endless corridors in the basement, some using scooters, some on their way to the locker rooms, indicated by sets of clean workwear neatly folded up under their arms. The AGVs (automatic guided vehicles) passing by, stopping, blinking, shifting direction. The mixture of fear and delight at the sight of myself in white in the mirror, taking the elevator up to the cancer unit.

The ward contained an office for each cluster, a reception, a lunchroom, and long white corridors, with differently colored doors indicating what to expect at the other side. A wooden color signified patient rooms that I learnt should be knocked on before entering, treatment rooms had white doors, while grey was chosen for service rooms such as stores and the pantry. I saw unfamiliar medical equipment and patients in beds in corridors. Patients walking slowly in the hallway, in their hospital shirts and slippers, some holding on to rods with bags attached to their body by tubes, containing fluids being extracted from their body, or antibiotics or other medication inserted into it.

Entering the single patient rooms, I was struck by the dominance of the large hospital bed, facing a flat screen television, the brightness of the rooms with their white walls, and a large window in the wall opposite the entrance. On the bedside table were personal belongings, a card with greetings from relatives, a mobile phone, medication, liniments and body lotion, lip

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balm, glasses of iced water and nutritious smoothies. I also noted down the movements I observed in these rooms, such as the medical staff rushing back and forth in contrast to the patients more or less tied to their beds and rods.

Moving around in these rooms and scenes, with their various movements and activities, I also became acquainted with the diversity of particular sounds and smells. In the basement, the sound of alarms from the AGVs and the beeping from the automatic machines where workwear is collected and laundry handed in merged with the vinegar-like smell of disinfected clothes. The quiet of the night was gradually replaced by a cacophony of sounds and smells as the ward awakened to its everyday activity. The regular sound of alerts on nurses' smartphones, messages given in the hallway, in pre-round, report or handover meetings, and conversations with patients amalgamated with smells of medication, and food from the kitchen area. The patient rooms smelled of food, sweat, excrement, vomit, perfume or soap, depending on the time of day and the patient's condition. Sometimes the rooms were strikingly silent, sometimes filled with sounds of crying, moaning, but also laughter and joking. I felt the awkwardness of the sound of sports commentators or canned laughter on TV mixing with nurses or physicians informing patients about their disease or treatment.

Becoming more familiar with the ward routines, I could perform tasks that brought me closer to patients, such as fetching their breakfast trays, changing their bedlinen, assisting them in their morning care, helping them to the toilet, and taking blood pressure. These activities could involve touching and feeling the clammy skin of a febrile patient during morning care or bearing the weight of a full-grown man while assisting him to the toilet. They also included looking at patients' faces expressing fear, pain, relief or apathy and hearing changes in their tone of voice from one day to another, expressing anger, despair, relief or hope. This meant being able to respond to the patients' mental state by attuning my own facial expression, gestures and tone of voice and finding comforting or encouraging words.

Proximity to patients involved being exposed to various bodily odors, like the overwhelming smell of excrement after leakage from an ostomy bag. During my familiarization with ward life and activities, some sensory experiences faded, while new sensory inputs suddenly stood out. However, what really aroused my interest in the smells, sounds, sensations and scenes of the cancer unit was the realization that the nurses could sense things that I could not. This revelation showed how using the senses represents a particular type of knowledge.

Analysis

The analysis that follows began immediately on entering the research setting. I learned about the nurses' use of senses in their work quite early in the fieldwork and dedicated significant time and attention to understanding what it entailed, i.e. how the nurses acquired and used their senses in clinical work, and their effort to render sensory input meaningful. This resulted in extensive and thick descriptions (Geertz 1973) of nurse-patient encounters. All field notes were written in Norwegian, and the extracts included in this article, has been translated making minor grammatical and aesthetic adjustments. Relevant field notes have been inductively differentiated and iteratively reviewed to explore the sensory aspects of the nurses' work with patients. The result of this process is presented in the next sections.

It's impossible to tell someone what it smells like!

The importance of the nurses' use of sensory knowledge struck me when a nurse opened a small bottle of vitamins. "These vitamins have a very characteristic smell," she said. I instantly recognized the smell of a vitamin syrup that we used to take as children, and suddenly realized that smelling must play some part in nurses' work. When I asked the nurse about this, she replied, "Oh yes, there's a lot of things I can smell! ... For instance, urine infection, or clostridiumⁱ! That's really easy to smell!" Another nurse confirmed this, saying, "Very! And melenaⁱⁱ, or necrosisⁱⁱⁱ!" When I asked different nurses on other occasions, they reacted in the same way and mentioned mostly the same smells. One nurse stated, "I don't know what I would have done without my ability to smell". Nurses also mentioned how easy the smells were to recognize, "Urine infection is really distinct, I can recognize that smell in the corridor!", and "With experience that smell's so obvious that I hardly bother to do the test. But of course we always do!"

This revelation surprised me. I had of course already experienced typical hospital smells of medications and sick patients. But the presence of smells in the air that I did not know or sense made me realize that the nurses' use of their senses like smelling represented a particular type of knowledge. When I merely smelled excrement, they could identify the presence of the intestinal bacteria clostridium, causing diarrhea. Where I smelled urine, they could detect whether a patient had a urine infection. When I asked nurses to describe the

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different smells, their replies were still consistent, but much vaguer than when I asked what they could detect by smelling. One nurse said, “You know it’s impossible to tell someone what it smells like. You just have to experience it!” Urine infection was often described as smelling like UTI (urinary tract infection). However, some odors were easier to describe: necrosis had a “rotten” smell and melena an “iron-like” smell. Generally, the nurses stated that they identified smells based on previous experiences of smelling, but could not describe smells precisely in words.

If the nurses could not describe the smell to me, how had they learnt to identify the different smells as an indication of a particular medical condition? During my time in the cancer unit, I found that nurses spent considerable time consulting with fellow nurses and other staff between patient visits, in the corridors, in the office or in pre-rounds or other meetings. Here, the nurses shared assumptions based on their sensations, and discussed suitable measures. One such typical situation took place at a pre-round meeting where a nurse, having assisted an elderly male patient to the toilet, discussed her experience with a physician:

The patient feels very weak, and has constant diarrhea after eating. It was a bit rough, the feces splashing on the walls as he bent down to sit on the toilet. It was greenish and smelled like clostridium. We did the test, but it was negative.

Based on the nurse’s experiences and her descriptions of the smells and look of the patient’s excrements, together with the negative test result, they discussed what the man’s diarrhea might indicate. They had already tried to take him off antibiotics as a possible cause of his diarrhea, but without result. Eventually they decided to adjust the patient’s diet, and the nurse was told to continue monitoring him to see if that helped. The nurses considered such consultations and tests important in learning to recognize clinical indicators like particular smells, because their assumptions were either confirmed or rejected, which thus informed their future interpretations of sensory experiences. Nurses reported having consulted colleagues and other professionals more frequently as graduates or as new to a ward. Many described having been made aware of a particular smell and what it could indicate when in a patient room with a more experienced nurse, or physician. Most, however, emphasized experience and time spent with patients as the most important factors. The variety of tasks involved in patient care and monitoring provided a sound basis for enhancing their ability to interpret various smells.

How are you feeling today?

The most obvious situation related to monitoring was the daily measurement of respiratory rate, oxygen saturation, temperature, systolic blood pressure, pulse rate, and level of consciousness, referred to as the NEWS (national early warning system). The NEWS score is a standardized method used in hospitals to assess acute illness, detect clinical deterioration, and initiate a timely and competent clinical response. I return now to the situation depicted at the very beginning of this paper, where the nurse enters the room, asks the patient how she feels, and then initiates the NEWS measurements:

The patient is lying in her bed, smiling slightly back at the nurse, "I'm okay," she replies, staring out of the window. The nurse performs the NEWS. Oxygen saturation, temperature and blood pressure are measured electronically. For the pulse rate, however, the nurse holds the patient's wrist, looks at her watch and counts. It is silent in the room. She writes down the results and turns to the patient: "It sounds like you have a respiratory infection. We'll let the doctor listen to you afterwards". The patient replies that her breathing does feel a bit heavy. "Are you feeling any pain at the moment," the nurse asks. "No, not when I'm lying like this", the patient replies. The nurse sits down in the chair by the bed. "But you're not supposed to be lying in that exact position in your bed all day, are you? Can you show me where the pain is located?" she asks, touching the patient's arm gently. "You're not supposed to have pain, and you need to tell us if you do, okay?"

When we went back to the office, the nurse said, "You know, the moment I entered the room, I could see she was in a lot of pain". "How did you see that?" I asked. "She was tense, stiff, there was something about the way she moved, and an expression in her face." She pointed at her upper lip to illustrate. Then she talked about the barriers to taking painkillers for some patients. She told me that they get depressed because they are in pain, and this causes apathy and reluctance to receive help. Sometimes they do not realize or accept that the pain is causing their depression. "It takes time convincing patients that they don't need to be in pain," she said.

In this typical situation, the nurse used her whole body in the evaluation of a patient's medical condition and well-being. She could tell that the patient was in pain from signs in her face and from the stiff movements when she altered the patient's bed position. She recognized the apathy that comes with depression from the patient's tone of voice. Touching her forehead, the nurse could feel if the patient was damp or warm. Looking her in the eyes, engaging in conversation, she determined whether the patient was conscious and alert. Holding her hand, she took the patients' pulse. In the silence that followed, she listened to the

patient's breathing, which could indicate whether she felt upset or not, or a possible respiratory infection. Using the electronic device to measure the patient's blood pressure, and the electronic thermometer for her temperature, she reads off vital information to supplement her bodily reading of the patient's condition. Thus, evaluating the patients' condition through the active use of the senses, and the reading of electronic measurements often worked to correct or confirm one another, and thereby operated as mechanisms in the development of sensory skills among the nurses.

In observational situations, as the one described above, the nurses are highly aware of their responsibility to monitor patients, and the indicators they should pay attention to. One nurse stated:

We need to be very observant about even the smallest sign of decline in these patients' medical condition. It means we need to spend time with the patients, observing them and talking to them.

When I asked the nurses what they attend to when entering a patient room, one said:

You know, I try to get an overall picture. I look at their skin, the expression in their eyes, and watch their body language, to see if the patient is stiff, or restless. I listen to how they breathe, and their tone of voice, and of course, what they say. Touch is also important of course, feeling their skin or their pulse.

All of these concerns are reflected in the typical questions that the nurses ask the patients, and which reveals yet another crucial aspect in the cultivation of the nurses' sensory knowledge, namely the patient's stories and sensory impressions. Getting the patients to talk was often initiated by the general question "How are you feeling today?" Subsequent questions may be: Have you eaten or drunk anything today? Have you been able to go to the toilet? Are you feeling warm? Are you feeling any pain? Are you feeling nausea? Asking these questions, the nurses relied on the patients' own evaluation of their bodily sensations. They also used sensory knowledge to make statements about a patient's condition, reflecting what they saw and heard: "I can hear from your coughing that you have an infection". Almost every nurse-patient encounter involved such statements: "I can see on your tongue that the fungus is receding", "I can feel that you have a fever", "I can see from the wound that there's an infection", or "I can tell from your skin that you've lost weight." Thus, the patients' stories was not taken at face value, especially when it came to pain, but was combined and

counterbalanced by what the nurses themselves could see, feel, hear or smell, and the results from tests or measurements like the NEWS-score.

However, not all situations and activities appeared to involve such overt monitoring. During a shift, the nurses pay repeated visits to the patient rooms, bringing meals with the associated medication, taking blood samples, changing or tending to catheters or wounds, assisting patients to the toilet or with getting dressed, and changing bed linen. During these routine activities, the nurses reported that they did not pay active attention to the fact that they were sensing, or to one sensory input at a time, such as looking, then touching, hearing and smelling. One stated: “I don’t go around sniffing for particular smells to try to detect anything, but I’d sense it instantly if the smell in the room indicated something, like clostridium or urine infection”. Another nurse said: “When I enter the room, I sense immediately if there’s anything special about the patient. It’s difficult to detect what it is exactly. It’s just a feeling that something’s not right”. Several nurses stated that their attention towards a particular sensory input is activated only when a deviation from normality is detected. Knowing what was normal, however, seemed to be a relative phenomenon, which required additional knowledge.

Sensing that something’s wrong

During the time I spent in the cancer unit, it became clear that making sense of sensory knowledge gained through close observation of and interaction with patients requires theoretical knowledge of the particular vulnerability of people suffering from cancer or hematological diseases, and the side effects of the treatment that need to be attended to. For instance, long-term use of antibiotics, as with many patients in the ward, increases the risk of clostridium, which made the nurses in this unit particularly attentive to indications of this condition. During a discussion on a patient’s blood pressure with a nurse working with hematology patients, the nurse explained to me that they were particularly concerned about that as a parameter for the clinical condition of the patients, because of the treatment they had been given, and the possible vulnerability it posed to the patients.

This information is also found in the literature on cancer nursing. According to Johansen (2017), patients who have been treated with cytostatic drugs run the risk of developing hematological conditions like febrile neutropenia, which is serious because of their poor

immune defense. These patients are therefore vulnerable to infections. A sudden fall in blood pressure, oxygen saturation, high respiratory rate and rising temperature could be symptoms of an emerging sepsis, possibly leading to septic shock, organ collapse, and eventually death. Signs of infection, like fever, a sore throat, diarrhea, or frequent urge to urinate therefore need to be taken very seriously, and the nurse needs to notify the oncologist or hematologist to proscribe antibiotics (Johansen 2017).

Thus, the biomedical, theoretical knowledge of the symptoms, and actions to be taken when detecting them, can be taught in textbooks, learnt on specialized courses, and verbalized in procedures for cancer nursing. Only three of the nurses that I observed and worked with had specialized in cancer nursing, but all the nurses appeared to have some level of expertise on different cancer diagnoses, treatments and side effects. They reported having acquired this knowledge working with cancer patients, looking at, touching, listening to and smelling their bodies, and then, based on these sensory experiences, consulting with more experienced nurses and physicians about their impressions and possible actions. Thus, theoretical knowledge and clinical experience of cancer and the interdependency between these two types of knowledge were reported to have been acquired and established in the continuous observation and monitoring of cancer patients.

The fact that they had acquired specialized knowledge about cancer patients became obvious when they had the possibility to work in other units. One nurse told me, “If I suddenly had to work one day on the ward for patients with heart conditions, I would feel quite lost. I don’t know the clinical indicators or the medications well enough to be able to do a good job”. During my observations, patients from other wards were often moved to the cancer unit, especially from the pulmonary and cardiac units, which are the wards under most pressure at the hospital. These patients were the responsibility of physicians specialized in pulmonary and cardiac diseases, but were nevertheless observed and cared for by the nurses in the cancer unit where they were located. The nurses sometimes said they felt uneasy about this, as illustrated by the following quote: “I have to read up thoroughly about this patient, he belongs to the heart unit, and he’s had several cardiac arrests. I don’t know that patient group very well, so I’m a bit stressed about it”.

I also learnt that their expert knowledge was specific not only to the cancer unit, but to the differences between patient groups located in the different clusters within the unit. Compared

to oncology patients, hematology patients were vulnerable in different ways, and needed to be more closely observed, or observed using different parameters. Some of the nurses were indeed reluctant to work in the hematology cluster, feeling insecure about their ability to provide adequate care for those patients, who need to be monitored very closely. In addition, the terminal cancer patients on palliative care in one cluster needed to be observed and cared for differently than the curative patients in another cluster. Hence, clinical indicators like high or low blood pressure or fever have different meanings and implications for different groups of cancer patients.

The importance of knowing the individual patient was also considered essential to the provision of proper care. If nurses knew that a patient normally had a high body temperature, they did not necessarily take steps to lower it, if the patient was feeling fine. Having spent time with patients over days, weeks and sometimes months, the nurses also often developed an emotional engagement with their situation. They got to know patients' relatives, found strategies to cheer them up, knew what topics to avoid, and when patients needed an extra push. This was also considered important knowledge in detecting deterioration in their medical condition, or helping them improve. After a visit to one patient, a nurse stated:

 Hmm... something's wrong with her. She isn't usually like this. I think she's worried about going home. We need to work on that. Getting home will normalize her situation. It will do her good.

The presentation of the findings in this study has aimed to depict how sensory knowledge is acquired and used by the nurses in the cancer ward. In the discussion that follows, I aim to elaborate further on how building sensory knowledge depends on a complex interplay between different types of knowledge, varies ways of sensing, and modes of learning. Furthermore, I claim that the ethnographic and phenomenological approach enables the study to demonstrate how sensory skills are established through the nurses' continuous, intersubjective, embodied and sensory interaction with patients, which is therefore crucial to the continuous cultivation of their clinical knowledge and expertise. Finally, I will indicate the broader implications of these findings for scholars interested in understanding knowledge in professional work and expertise, for managers and policy makers responsible for structuring professionals' work environments, and for all of us whose lives depend on such knowledge.

Discussion

As stated at the outset of this article, not many studies have investigated and aimed to understand how sensory knowledge is actually formed and comes to act. Sarah Maslen who has conducted an ethnographic study of how doctors learn to hear medically is a notable exception (Maslen 2015). In more recent publications she has investigated the nature and legitimacy of diagnostic sensory work in the meeting with new management regimes and techno-scientific changes in healthcare environments (Maslen 2016, 2017). The described crisis of legitimacy arises in an apparent conflict between the shift in medical regulation and governance involving enhanced reliance on formalized decision-making tools and test, and recent developments in the expertise literature, which have moved from conceptualizing expert decisions as rational, based in logical knowledge and ability, to intuitive competence. She described this as “[...] a gap between work “as imagined” by policy makers and work “as done” by doctors” (Maslen 2016, 173).

I claim that this gap poses a similar possible threat to the legitimacy of nurses’ sensory expertise. As stated in the introduction medical sensory work is frequently being reconfigured involving the distribution of sensory judgments to others, like nurses (Oudshoorn 2008, 2009). Still, the nurses’ work, where sensory judgments plays a crucial part, takes place within that same techno-scientific landscape and government regime. Hence, I argue that an ethnographic and phenomenological study of the acquisition and use of sensory knowledge among nurses represents an important contribution to the overall discussion of clinical expertise, and what constitutes “good” medical care in changing environments.

Making Sense of Sensory Knowledge in the Cultivation of Clinical Expertise

Sarah Maslen’s work identifies how learning to sense medically involves a complex interplay between theory, experience and creative attempts to describe and share knowledge that is difficult to put into words (Maslen 2015). She also found that in their diagnostic work doctors use their senses in a diversity of ways, from “clever” and “active” in examinations like auscultation, to ongoing sensing of patients bodies, characterized as intuitional and tacit. Sensing can be unmediated, or take place through the sensing of sensors like technological

outputs (Maslen 2017), of patients' senses, or in listening to patients' stories of sensory experiences (Maslen 2016).

Building on Maslen, this study among nurses has revealed how monitoring a patient's overall medical condition and well-being sometimes requires the ability to attend to and make sense of a particular sensory input, associated with a particular medical condition, akin to when a cardiologist perform auscultation. During the daily routine of measuring patients' NEWS score, for instance, the nurses paid active attention to certain sensory experiences such as the patients' temperature or blood pressure. Moreover, the NEWS score guided the nurses on the clinical indicators to focus on in future observations. Thus, the nurses, like Maslen's doctors, need to use their senses "cleverly", unmediated and coupled with sensing of sensors, in order to decide on any particular intervention, such as the taking of a test, the administration of antipyretics to reduce fever, of fluids to stabilize blood pressure.

Learning to use their senses actively involved adherence to clinical procedures, reading of technological outputs, or the taking of tests, confirming or disproving their unmediated sensing, feeding into future judgements. In addition, it often involved guidance from physicians and more experienced nurses. Maslen's doctors were, she claims, consistently of the opinion that even though formal training was essential, medicine is ultimately about apprenticeship. Students and trainee doctors learn through mentoring and experience, in a continuous and web-like mix of formal and informal training (Maslen 2015). This was evident also among the nurses in this study, as when newly employed nurses asked more experienced colleagues for advice, or in guided participation of students or trainee nurses.

The nurses' main responsibility was however not only to monitor one particular organ or indicator, but to keep a day-to-day watch over the patients, in order to identify improvements or deterioration in their overall medical condition. This required being able to detect various clinical indicators through different sensory inputs, and often a combination of these. Thus like Maslen's doctors, it required an ongoing attention to the patient with the whole sensorium, opening up to any sensory input that might, or might not, appear. Detection of pain often emerged from such ongoing and more or less tacit use of several sensory inputs, combining unmediated with sensing of the patients senses. Moreover, if the nurses' information indicated that the patient was stable, they reported entering the patient's room without paying particular attention to the fact that they were using their senses at all. Still, I

often observed that they expressed opinions about the condition of the patient during or after routine tasks like changing the bed linen, helping patients to the toilet, assisting them in their morning care, and serving meals.

Thus, the monitoring of patients was inseparably interwoven in the performance of various tasks in nurse-patient encounters. Looking, smelling, feeling and listening was an integral aspect of their movements in the room, of their interaction with patients, i.e. in the doing of nursing. Ingold (2011 [2000], 244) describes the nature of sensing as a scanning movement, accomplished by the whole body, from a fixed location, seeking out and responding to the clues in the environment to which it is attuned. When the nurses had learned to attend to relevant clues indicating a decline in the patient's condition, they became such an integral part of their doing that they served no further purpose (Ingold 2011 [2000], 416). It was therefore sometimes difficult to separate any particular sensory input that could be used to denote a particular indication. What they saw or did not see, what they heard or did not hear, smelt or did not smell, merged into "(...) a feeling, that something is not right". This is in line with contemporary work on expertise describing how expert decision-making is intuitive and responsive to contexts and situations occurring in the lived-in world (Collins and Evans 2007, Ingold 2011 [2000]).

This ongoing, tacit and intuitional way of sensing patients' bodies, involving the ability to combine several sensory inputs and sensing of patients' senses, did I claim involve another mode of learning than following procedures, or taking part in guided participation and scaffolding. Lawlor and Solomon (2017) describes how cultivation of expertise is complex and messy, involving both containment and contagion of knowledge as people actively engage themselves in intersubjective relationships to generate new understanding. To the nurses this quest for knowledge about the medical condition and well-being of patients necessitated repeated and continuous embodied interaction with them. It also necessitated engaging in communicative practices. Thus, the fact that the nurses found it difficult to verbalize the nature of a particular sensory impression did not stop them from talking about their experiences, trying to make sense of them and deciding on how to act.

This study has revealed how the nurses continuously asked questions and made assertions about patients' overall well-being and medical condition. They relied not only on what they themselves had sensed, but also on the patients' accounts of their own bodily experiences, as

well as relatives' stories. Thus, when they sense that a patient is in pain, they make further inquiries asking about how the patient feels. The patient's account is then counterbalanced with what the nurse are sensing, observing the patient's bodily gestures and facial expression and listening to their tone of voice, what they say and what they do not say. Furthermore, deciding on what action to take, the nurses continuously shared what they had sensed with other health professionals, consulting with other nurses, discussing patients at pre-round meetings with physicians, and reading written reports. Verbalizing their sensory experiences to others and deciding in collaboration on how to act were, according to the nurses, an important aspect of the process of building sensory knowledge, which enabled them to trust their own sensations and take independent decisions on them. Communicating through a recognizable linguistic repertoire what they felt, saw, heard or smelt was a way to convey an experience and a means to compare their experience with the experience of the other (Ingold 2011 [2000], 285) working to establish a community of practice (Lave and Wenger 1991). It was also a way to constitute themselves as experts (Carr 2010).

Building sensory knowledge by making sense of what they had sensed, "cleverly" or ongoing, unmediated or through the sensing of sensors, did however required further knowledge than the mere sensory impressions and discussing these with others. According to Merleau-Ponty, sensations are produced through people's encounters with sense-data, but are only realized when overlaid by a body of knowledge (Pink 2015, 29). The nurses reported that in most patient encounters, especially when patients were considered stable, attention to a particular sense was activated only when something deviated from what was considered "normal". Normality however, needed to be defined in a complex interdependence between theoretical knowledge and clinical experience.

Thus, being able to make sense of a deviation, labelling it, and knowing how to act on it requires theoretical knowledge about bodily functioning and malfunctioning; conditions and treatments of particular patient groups; and how aspects like age, sex and psychosocial factors affect the development of the disease and prognosis for recovery for individual patients. This theoretical knowledge is, however, meaningless if not combined with the clinical experience of knowing through the senses what infectious breathing sounds like, how fever looks or feels, or how clostridium smells. Furthermore, the nurses reported that biomedical knowledge of cancer diagnoses, treatments and side effects, was mainly learnt in clinical practice working in a cancer unit. This illuminates how building sensory knowledge

and expert skills requires a complex mix of and interdependency between different types of knowledge, and that this is established in practice, in the doing of nursing, interacting with particular patient groups.

A phenomenological and ethnographic study of clinical expertise

This way of conceptualizing expertise works to demystify the notion of what intuition is. Because it is difficult to explicate the content of intuitional skills in words, it has often been surrounded by an aura of mystique and described as a sixth sense. The sensory knowledge and perceptual skills that the nurses enacted in their work with patients surely had tacit elements. When the nurses reported that it was not possible to tell anyone what something smelt like, it indicates that “we can know more than we can tell” (Polanyi and Sen 2009 [1966], 4). However, building on the notion that even our most basic experiences are not private in any individual way, entailing a foundational intersubjectivity (Jackson 1998, Ingold 2011 [2000], Desjarlais and Throop 2011, Barth 2002), this study has aimed to demonstrate that sensory knowledge is still learned, shared and accounted for in the processes of building sensory skills and expertise. Patients communicate their sensory experiences by the way they move, by an expression in their face, by the look in their eyes, the tone of their voice, what they say and what they do not say. The nurses learned to recognize and interpret these cues as indications of particular conditions or a change in the patient’s condition, by tuning in and attending to and with their own senses, combining what they saw, heard, felt and smelt with theoretical knowledge through communicative practices.

A phenomenological approach involving participant observation and ethnographic interviews was, I claim, essential in recognizing the aspects of the nurses’ acquisition and use of sensory knowledge described and discussed in this article. Sensing my way into the hospital, I saw, smelt and heard many things, some that I immediately recognized as associated with the hospital, and some unfamiliar, which I did not know how to make sense of. When I became acquainted with ward life and activities, some sensory experiences faded, while other, new sensory inputs stood out, and yet others remained unrecognizable to me for the duration of the study. Taking part in the nurses’ activities did however enable me to observe and experience how they used their senses, and how in different situations they could suddenly realize that something was happening to the patient. This became evident by a look in their

eyes, their asking specific questions that for me seemed out of the blue, a slowing of their movements or sometimes stopping what they were doing to sit by the patient's bedside, looking at them, perhaps touching them and engaging in talk.

It enabled me to follow up by asking the nurses questions about what they had experienced in that situation. Their explanations fed into my own awareness of sensory inputs and experiences, when I eventually was given the opportunity to spend time alone with patients and perform tasks on behalf of the nurses. Thus, joining with the nurses in their practical activities with patients, I learned to attend to the things they were attentive to, engaging in talk in order to make sense of what they and I had experienced (Ingold 2011 [2000], 285). Attending to and with my body (Csordas 1993) became a means for me as a researcher to understand what was going on, which also provided insights into the crucial role of sensory knowledge in clinical work. It revealed how the cultivation of clinical expertise necessitates continuous embodied, sensory and intersubjective engagement with patients, in the daily managing of excrements, urine, blood, sweat and tears.

Broader Implications of the Study

With this study, I have aimed to contribute to enhanced awareness of the embodied, intuitional and sensory aspects of professional knowledge and skills, which I hope will encourage additional research related to other sectors and professions. Moreover, the study has intended to provide further empirical insight into the complex processes and intersubjective aspects involved in the cultivation of expertise (Lawlor and Solomon 2017) in a clinical context. These are important insights that I hope can feed into the socio-political discourse on what it means to practice and provide “good” medicine and healthcare, in which sensory work seems to be conspicuously absent (Maslen 2016).

Pine (2011) claims that the techno-scientific changes in healthcare workplaces are not only threatening to replace clinical judgments with technology and computerization. It also involves the introduction of a scientific rhetoric immanent in EBM and RCT, which when used as a tool and coupled with management control mechanisms becomes hegemonic, operating as ritual speech and transforming power relations. Thus, it works to constrain assertions about what counts as valid knowledge, accepted forms of representations, and how it can be communicated and employed in social interaction (Barth 2002). This is evident in

the tendency that physicians, nurses and other health professionals seem to incorporate management terms and ideas like “efficiency”, “evidence”, and “Best Practices” in their discourse and work practices, in the effort to reduce errors and avoid publicly exposed clinical failures (Pine 2011, Numerato, Salvatore, and Fattore 2012). If the result is an indiscriminate trust in decision-making tools and tests, which are also associated with risks and faults, this is a dangerous trend (Maslen 2016). Perhaps even more critical is the possibility that explicit conversations between health professionals on the accuracy, liability, uncertainty and risks associated with sensory knowledge in clinical decision-making is being silenced.

Adding empirical insight to research on sensory work in contemporary healthcare contexts, this article aims to give voice to the continued importance of sensory knowledge and skills in making diagnostic judgements. In order to avoid a decline in the performance of such skills, nurses, physicians and other involved in clinical decision-making need to possess the necessary amount of time, human resources and autonomy to prioritize engaging in continuous, intersubjective and embodied interaction with patients. Furthermore, the importance of an open dialogue about how to make sense of sensory knowledge must be acknowledged and arranged for by those who structure and manage hospitals and other healthcare institutions.

Finally, the findings in this study have implications for all of us who depend on the competence of nurses and other professionals to make decisions on our behalf, which ultimately can be a matter of life and death. This makes the role of sensory knowledge in the cultivation of clinical expertise an important area of study, to which this article has aimed to contribute.

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Notes

ⁱ Clostridium difficile bacteria cause diarrhea, are a frequent complication of some antibiotic treatments, and are increasingly common as a hospital-acquired infection (Kunnskapsforlaget 2017a).

ⁱⁱ Melena refers to dark sticky feces containing partly digested blood, resulting from internal bleeding or swallowing of blood (Kunnskapsforlaget 2017b)

ⁱⁱⁱ Necrosis is cell death in an organ or tissue, caused by disease, physical or chemical injury, or interference with the blood supply (Kunnskapsforlaget 2017c)