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Nurses' experiences of undertaking fertility-related discussions with teenagers and young adults with cancer: An interpretive phenomenological analysis

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Abstract

Aims: The aim of this study was to explore and interpret nurses' experiences, feelings and associated meanings attached to undertaking fertility-related discussions with teenagers and young adults with cancer. The study also aims to advance an understanding of factors which facilitate or hinder such discussions, to progress clinical practice.

Background: Improved cancer treatments have increased survival rates for many teenagers and young adults. However, as a side-effect of treatment, infertility may result. International and UK studies suggest this patient population may not be provided with adequate opportunities to discuss this important issue. Little is known about nurses' experiences of undertaking fertility-related discussions.

Design: Qualitative Interpretive Phenomenological Analysis.

Methods: Eleven semistructured interviews were conducted between February and May 2016 with purposively selected nurses working in a Teenage Cancer Trust Unit in a UK hospital. Interviews were recorded and transcribed verbatim. Data were analysed using Interpretive Phenomenological Analysis.

Findings: Nurses experienced a perceived lack of knowledge resulting in avoidance of raising fertility issues. Nurses expressed a specific need for more knowledge and education which was viewed as an essential prerequisite to their participation in discussions. The limited time frame for female patients to preserve fertility prior to commencement of treatment was felt to inhibit both fertility-related discussion and fertility preservation.

Conclusion: Ongoing education and support for nurses may ensure teenage and young adult cancer patients' reproductive needs are met. Nurses need to consider ways to ensure female patients benefit from improved information regarding infertility risks and preservation options to support their reproductive needs.

KEYWORDS
cancer, fertility discussion, fertility preservation, nurses, teenager and young adult

1 | INTRODUCTION

Teenagers and young adult (TYA) cancer survival rates have improved in the UK over the last 40 years (Cancer research UK, 2017). Consequently, TYAs with cancer may find their lives affected by long-term effects which may have an impact on their quality of life. Infertility is one such consequence of the toxic effects of chemotherapy and radiotherapy. Its incidence depends on the specific cancer, the individual's age, gender, diagnosis, and treatment dose (Pacey & Eiser, 2014). The ability to retain reproductive potential is a significant concern for TYAs, not only in the UK but internationally (Anderson et al., 2015; Armuand, Wettergreen, Rodriguez-Wallberg, & Lampic, 2015; Barlevy, Wangmo, Elgar, & Vardit, 2016; Ellis, Wakefield, McLoone, Robertson, & Cohn, 2016; Geue et al., 2014). The importance of acknowledging fertility concerns in this client group is recognized in the "International Charter of Rights for Young People with Cancer" (Rajani, Young, McGoldrick, Pearce, & Sharaf, 2011).

1.1 | Background

The likelihood of infertility arising following cancer treatment cannot accurately be predicted (Yeomanson, Morgan, & Pacey, 2013). Whilst some treatments are unlikely to compromise fertility, it is difficult to predict those patients who may relapse and subsequently require second-line treatment which may lead to permanent sterility (Anderson et al., 2015). Fertility preservation (FP) involves freezing and storage of gametes, ovarian reproductive material or embryos for use in a person's future fertility treatment (Royal College of Nursing, [RCN], 2017). The effective established method of FP for postpubertal males is cryopreservation of spermatozoa. This involves the male producing samples of semen by masturbation, which is then frozen in liquid nitrogen (RCN, 2017). Males as young as 13 years have achieved successful sperm cryopreservation (Anderson et al., 2015). Female preservation options are more complex as they involve a surgical procedure to remove oocytes from the ovaries (RCN, 2017). Oocyte cryopreservation is an option for females without a current partner and there have been successful cases of oocyte cryopreservation in female adolescents (De-Vos, Smitz, & Woodruff, 2014). Alternatively, embryo cryopreservation is the established method for females who are in a stable relationship at the time of treatment (RCN, 2017); however, this may delay the initiation of cancer treatment by two to three weeks (Linkeviciute, Boniolo, & Peccatori, 2014). Testis or ovarian tissue cryopreservation, whereby tissue is surgically removed and preserved for later transplantation in adulthood, has the advantage of being rapidly achievable as no pretreatment is required (RCN, 2017). Whilst still experimental, such developments in reproductive technology are increasing the likely success of a range of FP methods.

International clinical guidance recognizes the importance of FP for TYAs and the requirement for preservation to be performed before initiating cancer treatment; the opportunity will be lost if first-line chemotherapy has already been administered (American Society of Clinical Oncology, [ASCO], 2013; Clinical Oncology Society of Australia, 2014; German Society of Haematology and Medical Oncology, 2012; NICE, 2013; RCN 2017; Royal College of Physicians, Royal College of Radiologists, Royal College of Obstetricians and Gynaecologists, [RCOP], 2007; Scottish Intercollegiate Guidelines Network, 2013). Since improved survival outcomes are linked to early diagnosis and initiation of cancer treatment, early referral to fertility services is crucial, particularly for females, to prevent

Why is this research needed?

- Future reproductive potential is an important issue for teenagers and young adults with cancer and can contribute to improved quality of life in cancer survivorship.
- Little is known about nurses' experiences of undertaking fertility-related discussion with this patient group.
- It is important to explore barriers and facilitators which may influence nurses' active participation in fertility-related discussions, to provide high quality patient care.

What are the key findings?

- Nurses perceived knowledge deficits were experienced as a barrier to fertility-related discussion which resulted in avoidance of raising the subject with teenagers and young adults with cancer.
- In response to identification of such deficits, nurses expressed a specific need for more knowledge and education which they believed was an essential prerequisite to participation in fertility-related discussion.
- The limited time frame for females to preserve fertility prior to commencement of cancer treatment was felt to inhibit both fertility-related discussion and any form of fertility preservation.

How should the findings be used to influence policy practice/research/education?

- Care organizations may wish to develop targeted educational initiatives which may improve nurses' knowledge and confidence and increase their willingness to undertake such discussions.
- Nurses need to develop strategies to ensure young females are fully informed regarding potential infertility, irrespective of perceived time constraints, the viability of preservation options, or assumed medical priorities.
- Research should focus on evaluating the effectiveness of training initiatives in raising nurses' confidence to discuss fertility issues and teenagers and young adults' views on fertility information provision.

unnecessary delay in commencing cancer treatment (Rodriguez-Wallberg & Oktay, 2014).

Discussion of the potential risks of treatment on fertility and an explanation of possible preservation options is essential (National Institute for Health and Clinical Excellence, 2013). Significantly, recent UK guidance emphasizes the pivotal role of the nurse in non-fertility settings engaging in such conversations (RCN, 2017), supporting previous suggestions that nurses are ideally placed to adopt this role successfully (Gorman, Usita, Madlensky, & Pierce, 2011; Penrose, Beatty, Mattiske, & Koczwara, 2012; Yee, Fuller-Thomson, Dwyer, Greenblatt, & Shapiro, 2012).

The receipt of information regarding reproductive loss and options for FP is associated with improved quality of life, less regret (Letourneau et al., 2012; Mertes, 2015; Peddie et al., 2012), and improved ability to cope (Saito, Suzuki, Iwasaki, Yumura, & Kubota, 2005). However, findings from studies largely relating to doctors' perspectives, employ a mixed samples of doctors and nurses, or has a specific male or female patient focus have identified a range of barriers which may inhibit adequate discussion of FP options. Patient-related factors, such as gender, have been found to be an influencing factor; females are less likely to be referred for FP or receive such information (Kohler et al., 2011; Peddie et al., 2012; Yeomanson et al., 2013), despite 59% of HCPs perceiving FP amongst females to be a "top priority" compared with males (Ussher, Cummings, Dtyden, & Perz, 2015, P8). Other patient-related barriers related to the HCPs perception that priority regarding FP varied according to a patient's cultural background (Archille et al., 2006; Goodwin, Oosterhuis, Kiernan, Hudson, & Dahl, 2006; Kurt, Topcu, Savaser, & Sen, 2013). HCPs have also been found to consider it inappropriate to discuss FP with patients who they believed had a poor prognosis (Adams, Hill, & Watson, 2013; Gilbert, Adams, Mehanna, Harrison, & Hartshorne, 2010; King et al., 2008; Ussher et al., 2015). Institutional barriers include a lack of FP specialists to whom patients can be referred (Kurt et al., 2013; Louwe et al., 2018; Shimizu et al., 2013) as well as the cost of FP interventions (Vadaparampil et al., 2007).

In the limited and rather dated studies specifically conducted among nurses, a lack of knowledge and training on the topic has also been shown to determine their willingness to undertake fertility discussions (King et al., 2008; Nagel & Neal, 2008; Reebals, Brown, & Bucker, 2006). Significantly, only 6% of nurses felt fertility was an issue to be discussed by physicians only (Clayton et al., 2008), with 91% indicating that nurses and social workers should be responsible, (Vadaparampil et al., 2007). An exploration of the factors which facilitate or hinder nurses undertaking such discussions may be beneficial to UK and international nurses, to help evaluate and strengthen their fertility communication to improve the overall quality of life for TYA cancer survivors. The findings may also be useful to nurses discussing diverse sensitive topics in other healthcare specialities, both nationally and internationally.

This paper presents the findings from a study exploring nurses' experiences of and feelings about, undertaking fertility-related discussions in a Teenage Cancer Trust (TCT) Unit with teenagers and young adults prior to commencement of chemotherapy.

2 | THE STUDY

2.1 | Aims

The aim of this study was to explore and interpret nurses' experiences, feelings and associated meanings attached to undertaking fertility-related discussions with TYAs with cancer. The study also focuses to advance an understanding of factors which facilitate or hinder such discussions, to progress clinical practice.

2.2 | Design

A qualitative approach informed by Interpretive Phenomenological Analysis (IPA), (Smith, Flowers, & Larkin, 2009) was employed. This is aligned with Heidegger's hermeneutic approach, incorporating the philosophical principles of constructivist ontology and an interpretive epistemology. IPA was chosen as it values participants subjective experiences with the emphasis on exploration of meaning and sense-making (Smith et al., 2009).

2.3 | Sample

The purposive sample consisted of 11 nurses from a TCT unit based in an English teaching hospital. Participant information sheets containing details of the study were distributed to all 34 nurses working on the unit who fulfilled the inclusion criteria: any grade of Registered Nurse who had been employed on the TCT unit for a minimum of six months and interacted with TYAs prior to initiation of cancer treatment. In accordance with the principles of an emergent design, no predetermined number of participants was identified at the commencement of the study (Polit & Beck, 2014). It was envisaged that it would be likely to be between 6-12 participants but would only be finally established at the point at which data saturation was achieved, (Denscombe, 2014) (Table 1).

2.4 | Data collection

Individual face-to-face semistructured interviews were used to fulfil the need to generate rich contextual data. The interview schedule was constructed by the lead author (EW) using open nondirective questions based on the study aims (see supplementary information file: Table S1, Interview Schedule). Interviews were led by what the participants deemed as important providing they were relevant to the research question (Smith et al., 2009). A single pilot interview was conducted that confirmed the questions were clear and capable of providing sufficient and relevant data to answer the research question. As it generated usable data, it was included in the analysis. Data were collected by EW and took place February 2016–May

TABLE 1 Participant demographic data

Participant	Age	UK Banding Structure[a]	Gender	Number of years as a Registered Nurse	Number of years as a paediatric/TYA cancer care nurse	Specific training on fertility	Specific training on TYAs
1	21–30	5	Female	4.5	4.5	Yes	Yes
2	21–30	5	Female	4	4	No	Yes
3	41–50	6	Female	25	25	No	No
4	41–50	7	Female	21	21	No	Yes
5	>50	7	Female	29	20	Yes	Yes
6	31–40	6	Female	8	8	No	Yes
7	21–30	6	Female	6.5	6	No	Yes
8	31–40	6	Female	15	15	No	Yes
9	>50	7	Female	31	28	No	Yes
10	31–40	6	Female	8	8	No	Yes
11	21–30	5	Female	7	6	No	Yes

[a] Band 5: Initial grade of qualified nurse.
Band 6: Experienced senior nurse with more responsibility for the overall running of the ward.
Band 7: Ward manager/ward sister responsible for the management of staff and has control of the ward budget (National Health Service Employers, 2018).

2016. Interviews lasted between 28-44 min and were digitally recorded and transcribed verbatim by the lead author.

2.5 | Ethical considerations

The study was approved by the local NHS Research Ethics Committee and the University. Participation was voluntary and written consent was obtained, including permission to use quotations in the dissemination of the study. Participants were told that they could withdraw at any time up to the point of data analysis. Confidentiality and anonymity was assured by removing all identifiable information from the taped data. A random number was assigned to each participant.

2.6 | Data analysis

Data analysis conformed to the IPA analytical process (Smith et al., 2009) outlined in Table 2: "Steps in the Analytical Process". Major themes were identified in the data with the requirement that at least half of all participants must have contributed responses pertinent to it (Smith, 2011).

2.7 | Rigour

Congruence with Yardley's (2000) quality criteria, "Coherence" was established by ensuring a close fit between the research question, method and the IPA philosophical perspective. "Commitment and rigour" was maintained through the participation of all three authors in attentive discussions relating to formation of themed categories, informing a thorough idiographic analysis and interpretation. The themes were elicited from the responses of over 50% of respondents (Smith, 2011), (Supplementary information file, Table 2S: "Master Table of Themes" for all 11 Participants), with verbatim quotations provided to support the interpretation and demonstrate "sensitivity to context". The study's investigation of an under-researched clinical topic and one which may potentially be applied in TYA cancer care helps to fulfil Yardley's "impact and importance" criteria.

3 | FINDINGS

Four themes arose from the data. Two interrelated superordinate themes were selected for discussion in this paper based on their international clinical relevance to nurses: "recognition of the importance of knowledge" and "time is of the essence". Each individual participant's contribution to the themes is evidenced in Table 2S (supplementary information).

3.1 | Recognition of the importance of knowledge

Encompassing two subthemes, this theme reflected the nurses' central concerns regarding perceived knowledge deficits and their various responses to it.

3.1.1 | Perceived lack of knowledge

Ten/eleven nurses perceived their lack of knowledge to be a significant barrier, resulting in them avoiding raising fertility issues. Knowledge insufficiencies were particularly significant in areas such as policy and guidance and knowledge required to adequately prepare TYAs for the sperm banking process. Their avoidance of FP discussions appeared to reflect their personal belief in their inability to be effective and useful to TYAs. This is illustrated in the following quotations:

TABLE 2 Steps in the analytical process (Smith et al., 2009)

Step 1: Engagement with the data	Transcripts were read and re-read
Step2: Initial noting/explanatory comments	Important text was highlighted Descriptive comments were documented relating to issues of importance for nurses Conceptual comments were made which were more interpretive and arose from the participant's words Linguistic comments were added which focused on the use of the participant's language. These linked descriptive comments to conceptual comments.
Step 3: Developing emergent themes	Connections and patterns between explanatory comments were identified which reflected matters of importance for nurses Initial emergent themes were listed chronologically on a separate sheet of paper
Step 4: Working with larger samples: Identifying key emergent themes for the group.	Emergent themes were not identified at core level as is the case for smaller samples (under 6) Step 3 was repeated for the other 10 transcripts New themes were allowed to emerge with each new participant account, consistent with IPA's idiographic commitment
Step 5: Looking for patterns across cases	Connections and patterns across cases were identified Themes from all 11 transcripts were typed onto a separate sheet which were cut up and moved around to form initial related themes Transcripts were checked to ensure the themes were consistent with the participants accounts Reoccurrence across cases was measured, which is important in studies with larger samples (above 6) Final table of superordinate themes was produced Themes were named to reflect their conceptual nature

> "… I don't feel like I have the knowledge to do it … I don't think it's helpful me bringing up the topic of fertility preservation without actually being able to advise them on what's involved or not involved …" (Participant 1)
>
> "If your knowledge isn't sort of, you know, very solid on the subject, you don't want to risk saying anything that's going to upset someone …" (Participant 2)

The participants assume that a level of preexisting knowledge is required for them to be effective and their assessment of their own lack of knowledge appears to act as a decisive factor in preventing their involvement in discussions. By focusing on a justification, such as appearing unhelpful or upsetting patients, participants were able to avoid any sense of self-blame.

In the following account, the participant seems to downplay her knowledge deficits, whilst still acknowledging they exist, hinting that her knowledge does not coincide with her length of experience. By comparing herself to others who may experience similar knowledge deficits she is able to minimize any shortcomings, thus normalizing the situation to possibly boost her self-esteem:

> "I must admit my own knowledge, despite working in this area for a long time, is quite limited when it comes to females and their fertility … I think that's very much seems to be for everybody …" (Participant 3).

Eight participants reported a significant knowledge deficit regarding fertility policies:

> "No, I am not aware of a single guideline in place currently" (Participant 10).
>
> "I certainly couldn't name or even locate a specific policy actually around fertility in relation to treatment to be honest" (Participant 11).
>
> "I am sure there will be some [guidelines] but if I am honest I haven't read them" (Participant 1).

The nurses here appear unmotivated to search for information that could possibly boost their knowledge and abilities to address fertility issues with young people. The disinterest such responses reveal could also indicate an unwillingness to proactively address their own learning needs. Participant's responses also revealed a willingness to "pass the buck". Several interviewees revealed that male patients might be sent to the Assisted Conception Unit (ACU) apparently lacking information and unprepared for what was involved in the sperm banking process:

> "I wouldn't really feel confident answering in terms of how successful it is [preservation procedure] and things like that which is what he did ask … I just encouraged him to sort of ask that when he got to the centre" (Participant 2)
>
> "I would be happy to say what the options are, but I don't know a lot about it. But I'm not sure that's all that important because if they are willing to go ahead they get a big discussion with the ACU anyway" (Participant 9).

> "But in ACU they will have a more in-depth sort of discussion where they do have the expertise" (Participant 5).

There is little sense of ownership here, with the nurses exercising proxy agency; they presume that ACU staff are more conversant with the topic and so will act on their behalf. This lack of ownership, combined with the consequences of lack of knowledge, held a powerful meaning for one participant. She had experienced ACU staff "getting cross at the ward staff" for not providing enough information to TYAs and recalled an accusation from an ACU member of staff:

> "… by sending the young people there it's a kind of a form of child abuse almost … you shouldn't be sending these young people here; they don't really know what's involved" (Participant 8).

Dual interpretive meanings are presented in the powerful use of the term "child abuse" which was very significant for the nurse, especially since it is defined as "maltreatment, emotional harm and any action which causes significant harm" (Macmillan online dictionary, 2016). Her disclosure is important in highlighting potential consequences of failing to meet TYAs information needs and demonstrates the depth of emotional feeling involved.

Interestingly, reflecting the particularity of the individual experience, only one nurse indicated that her lack of knowledge did not deter her self-confidence in fertility-related discussions, thus highlighting an element of divergence:

> "I don't feel unconfident that I don't know. If I don't know I will say I don't know but I will find out for you … I will go out there and find information out for myself" (Participant 4).

The above account emphasizes the participant's sense of personal agency in proactively seeking out information. Unlike other interviewees, she takes personal responsibility for knowledge acquisition.

3.1.2 | Responses to identification of knowledge deficits

Nine out of eleven nurses' responses to their knowledge deficits focused specifically on an expressed need for more education. This was seen to be a vital prerequisite to participation in fertility discussions and was often viewed as a means of acquiring increased comfort and confidence with the topic.

> "So, with extra training I would be confident doing it, but at the moment I don't know enough about it to be helpful to the young adults and families" (Participant 1).

> "I don't know where you would get the training but it would be nice to have… make me feel more confident" (Participant 6).

The nurses perceive the absence of training as a barrier and trust that their confidence would increase by gaining additional training. Training is perceived to be a valuable facilitator in equipping nurses with the necessary skills and expertise to proactively discuss fertility issues and answer TYAs questions with ease and confidence.

In response to her knowledge deficit, participant eight identified a need for more education on the regulations associated with fertility preservation and storage which she felt would increase her personal comfort. Participant two identified a need for education on gonadotoxic effects of chemotherapy treatment, to make her feel "less intimidated" when TYAs asked questions. Five participants wanted to learn more about the actual preservation process and procedures from ACU staff "… knowing more about exactly what they do when they are down there".

These responses are characterized by a lack of personal agency to fulfil their own learning needs and is particularly evident in the following account:

> "… no we are not very good at being kept updated about it." [Fertility preservation and storage process] (Participant 8).

The use of the word "being" seems to imply that this participant felt it was somebody else's responsibility to provide education and adopts a default position of reactive engagement in the provision of fertility information.

3.2 | Time is of the essence

Nearly, all (nine/eleven) nurses described the limited time frame for females to preserve their fertility before commencing cancer treatment as a barrier to both fertility discussion and fertility preservation. Nurses felt that "time is of the essence", a phrase used by participants themselves and one which aptly captions this theme:

> "It's not as easy for females … you have got to start the treatment straightaway" (Participant 7).

> "… Often between their diagnosis and needing chemotherapy there isn't time to do that" (Participant 3).

> "… it was almost like at the time the focus was on just get treatment started … time is of the essence in terms of starting treatment" (Participant 1).

> "The fact that there is not time for the process … with the girls, time is of the essence …" (Participant 2).

There appears to be general agreement here that lack of time is an insurmountable barrier. There is a suggestion of resigned acceptance that, in all cases, treatment has priority over fertility preservation, rather than considered on an individual patient basis. This acceptance appears to originate from the belief in the medical teams prioritization of cancer treatment, a view which was also felt to influence female patients' decision-making as illustrated in the following quotations:

> "… I think a lot of females are swayed towards not taking up the option of having preservation … just because actually the risk of them delaying their cancer treatment …" (Participant 11).

> "From a doctor's point of view … treatment is much more important and we just need to get on with it rather than allowing girls to try to undergo the procedure" (Participant 8).

The nurse's use of the word "allowing" is significant here as it appears to reflect her belief that a doctor's permission is required to delay treatment. The nurses also appear to be of the opinion that doctors assume to know individual female's preferences and priorities. Indeed, the following quotation suggests one nurse felt it was solely a medical decision which should be accepted without question:

> "It's quite a lengthy process for them … possibly the consultant is not happy for them [females] to wait what might be 6 weeks for the treatment to start" (Participant 9).

Participant three goes beyond a simple acknowledgment of missed opportunities and describes the potential consequences of delaying treatment.

> "Sometimes females don't get offered the opportunity to look into their fertility and look what is available … I think if their life was going to be put at risk because the chemotherapy was delayed, then obviously they wouldn't be fertile in the future anyway" (Participant 3).

Here, lack of sufficient time is not viewed as an avoidance approach, but somehow justified by the potentially conflicting necessity to save life. In addition, participant ten felt that discussions were less likely to happen in the absence of viable FP options.

> "So, because they might not be able to, might not be able to do much for a female that could be the reason they just avoid talking, like mentioning the side effects" (Participant 10).

Here, the nurse appears to exclude herself from the group of unspecified individuals she refers to with the use of the word "they". This suggests she does not feel personally responsible and does not wish to be associated with this avoidant approach. However, participant one's account challenges many of the assumptions and hints at "excuses" for not talking to females about their fertility:

> "There is a fair amount of time while you are getting all of the pretreatment scans and investigations and stuff done. So there is no reason why in my head, why you couldn't talk about fertility then, especially for the females" (Participant 1).

This account raises the question whether time is used wisely by the healthcare team generally (the nonspecific "you" pronoun) and implies that a failure to address fertility is not always an inevitable consequence of lack of time.

4 | DISCUSSION

This study explored nurses' perceptions of their experiences of discussing fertility issues with TYAs with cancer. The findings identified that a perceived lack of knowledge of FP options, processes and procedures was a central concern for nurses. These knowledge deficits negatively influenced the likelihood of fertility issues being discussed. This validates the findings of previous studies, (King et al., 2008; Nagel & Neal, 2008; Reebals et al., 2006); Ussher et al., 2015).

In the current study, nurses' inability to name a single local or national fertility guideline echoes findings from previous research from the USA (Clayton et al., 2008; King et al., 2008). Knowledge deficits in this area are an important omission. Written professional guidance may contribute to evidence-based practice, which is the key to delivering effective care for TYAs of both sexes (Nursing and Midwifery Council, 2015) and may avoid habitual practice and practice variation (Mantzoukas, 2007). The RCN (2017) has recently published guidance which aims to encourage timely discussions of fertility issues by nurses with both males and females to facilitate a more consistent approach to FP referral. However, such recommendations intended to improve knowledge may have a minimal effect on clinical practice; our findings suggest nurses' apparent unreceptiveness to their value.

This study found that, as a result of knowledge deficits, nurses are failing to adequately inform young males about the procedures involved in banking their sperm. A possible explanation may relate to the evident lack of interdisciplinary collaboration between oncological and reproductive specialities. A team approach is advocated drawing on combined expertise; the success of FP services is reliant on nurses initially raising the subject and referring on for specialist counselling (RCN, 2017). Therefore, acquisition of an extensive level of knowledge as perceived by nurses in the present study is not essential. Interdisciplinary working may also avoid accusations likened to "child abuse" by ACU staff, directed at the oncology nurses who were perceived to be failing to prepare young males adequately. Lack of preparation may result in young males not being able to produce a sperm sample required for freezing, which is consistent with previous study findings (Chapple et al., 2006; Edge, Holmes, & Makin, 2006). As part of the ACU preservation consent procedure, young men will be asked questions about what to do with their stored sperm sample/s if they become incapacitated or die; (a mandatory element of the FP process, (Human Fertilisation and Embryology Authority, 2008). Such questions have the potential to provoke intense anxiety as the TYA is required to consider the possibility of dying (Teenagers and Young Adults with Cancer, [TYAC] 2015). TYAs may neither have considered their own mortality nor contemplated future parenthood (Morgan, Davis, Palmer, & Plaster, 2010). Clear guidance detailing what to expect in the sperm banking procedure beforehand may reduce anxiety for young men, (Nagel, Cassano, Wizowski, & Neal, 2009) and increase the chance of successful sperm production. A liaison system between oncological and reproductive specialities may be useful in providing nurses with clarity about their fertility discussion responsibilities and promote a sense of ownership, which our findings suggest is currently lacking.

Nurses' expressed a specific need for education and training to address their identified knowledge deficits. This was perceived to be a vital prerequisite to their participation in fertility discussions. This finding confirmed the observations reported in previous studies (Goodwin et al., 2006; King et al., 2008; Nagel & Neal, 2008). Nine out of eleven nurses in the present study and 82% of nurses in Ussher et al.'s (2015) Australian study felt that increased knowledge would equip them with the skills to be more competent in their abilities and subsequently more comfortable in discussions. Our findings indicate nurses strongly believed that this would be the case. However, it is not known whether training dedicated to improving nurses' fertility knowledge would produce a positive effect on nurses' behaviour to undertake discussions. Parallels can be drawn between communication required to address the fertility needs of patients diagnosed with a life-threatening illness and communication required to address other sensitive and emotional topics. Previous UK training initiatives aimed at oncology disciplines have demonstrated improvements in HCPs communication skills and confidence in imparting bad news to patients (CONNECTED, National Cancer Action Team, 2012). Conversely, it is important to be aware that skills learned in the education environment are not always transferred back into the clinical setting (Heaven, Clegg, & Maguire, 2006). Therefore, it is debatable whether providing education equates to increased comfort and confidence in participating in discussions. This study serves as a stimulus for further research. Studies are needed to evaluate the effectiveness of training initiatives in raising nurses' confidence to discuss fertility issues, as well as ascertaining the views of TYAs on their preferences for fertility information provision.

The findings also support previous research suggesting that gender differences exist which may determine the likelihood of discussion and provision of information on FP options (Armuand et al., 2012; Kohler et al., 2011; Peddie et al., 2012). The limited window of opportunity for females to preserve their fertility and the perceived length of time required to undergo preservation procedures, has been shown to greatly reduce the likelihood of females being informed about and supported to further explore FP options. The assumed urgency to initiate cancer treatment took priority over fertility considerations. This appeared to be a medical priority rather than a result of an honest and open discussion exploring female patients' desires or priorities, in relation to parenthood. Nurses appeared to accept what they perceived to be doctors' prioritizing decisions as unequivocal.

It is important to be aware that early referral to a FP specialist can decease time delays and make female preservation a safe and viable option (Lee, Ozkavukcu, Heytens, Moy, & Oktay, 2010). In addition, recent developments in ovarian tissue cryopreservation have resulted in a viable FP option which can be performed without delay (Knight et al., 2015). A 4–8 week break between surgery and chemotherapy treatment for some types of cancer could provide a window to preserve fertility (Turin, Bedoschi, May, & Oktay, 2013). Notably, only one participant in our study reported similar views with the majority perceiving lack of time as an insurmountable barrier. Clearly, some young females may not be clinically well enough to consider their fertility. Guidance offers little direction other than to recommend HCPs consider if there is sufficient time available (National Institute for Health and Clinical Excellence, 2013; Royal College of Physicians, Royal College of Radiologists, Royal College of Obstetricians and Gynaecologists, 2007). Shnorhavorian et al. (2014) identified that 38% of females were willing to delay treatment for one month. Whilst not all females will choose to preserve fertility, it is essential that they are provided with timely information and be empowered to consider potential options based on their own personal priorities. The most equitable approach is to raise fertility issues with every young female even if concerns are not expressed at diagnosis (Gorman et al., 2011; RCN, 2017), to avoid feelings of loss of control (Armuand et al., 2015; Lee et al., 2011) and to ensure a female's parenthood priorities are voiced. Significantly, research has demonstrated that young females want as much information as possible around the time of diagnosis regardless of the availability of FP options or outcome (Crawshaw, Glaser, Hale, & Sloper, 2009; Peate et al., 2011). Nurses need to possess greater awareness of what the opportunity for discussion means to TYAs rather than the significance of a discussion per se. Moreover, counselling by a FP specialist may reduce long-term regret and improve quality of life whether fertility is preserved or not (Letourneau et al., 2012; Mertes, 2015). Consequently, even if no preservation options are available, a discussion will provide an opportunity for mourning the loss of fertility, provide acknowledgement of the importance of future fertility and contribute to improved psychosocial outcomes in cancer survivorship (Levine, Canada, & Stern, 2010).

4.1 | Limitations

Whilst providing valuable data on this underresearched issue, the small self-selected homogenous sample limits generalization to a wider population. This study is based on one unit and may not reflect the priority given to such discussions in other care settings.

The sample comprised solely of female nurses and therefore will not be representative of all nurses who work with TYAs with cancer.

5 | CONCLUSION

Advances in FP options and assisted reproductive technologies have provided viable opportunities for TYAs to preserve their fertility in light of their increased chance of survival following cancer. This study offers new insights into this significant contemporary nursing issue from the perspective of nurses themselves. It also contributes to the body of knowledge by suggesting several possible improvements with regards to education and prioritizing opportunities for discussion with female patients. Nurses are ideally placed to support TYAs throughout their cancer journey. Therefore, to encourage nurses to take personal responsibility with regards to fertility discussions and establish fertility as a core component of cancer care, the implementation of educational initiatives is essential, together with institutional support in incorporating guidance into clinical practice. All TYAs must receive information regarding the potential impact of cancer treatment on future fertility. Information provision is essential; irrespective of the potential for FP, the viability of such options or healthcare professional assumed priorities. This may ensure equitable opportunities for all TYAs and improve overall quality-of-life into survivorship.

CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

AUTHORS CONTRIBUTIONS

E.W., W.N., M.G. made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data. E.W., W.N., M.G. involved in drafting the manuscript or revising it critically for important intellectual content. E.W., W.N., M.G. gave final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content. E.W. agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE [http://www.icmje.org/recommendations/]):

- substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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