Article details: 2015-0086	
Title	Principles of fatigue in residency education: a qualitative study
Authors	Taryn S. Taylor MD, Christopher J. Watling MD PhD, Pim W. Teunissen MD PhD, Tim Dornan MD PhD, and Lorelei Lingard PhD
Reviewer 1	Dr. Anne Koerber
Institution	University of Illinois at Chicago, College of Dentistry
General comments (author response in bold)	1. Regarding your categories in table 1: a. Fatigue is inescapable and therefore acceptable (your quotes indicate that fatigue is considered the norm; I'm not sure they demonstrate that it is therefore acceptable) **i. We have altered the category to reflect this nuance as you've suggested. The category was revised: "Fatigue is inescapable and therefore accepted". We believe this is better aligned with the quotations "I think it's kind of expected. Everyone knows your going to be tired" (012) and "I don't think, culturally, talking about being tired is really appropriate in my program. We accept it…"(013) P.8, Table 1** b. Fatigue is manageable through experience ("you just need to rethink how you redistribute your manpower in order to make it realistic" may indicate that manpower actually ought to be redistributed to avoid creating fatigue) **i. We have chosen an alternative, more salient quotation from the interviews that we think captures this category "I'm sure people will disagree and this seems silly but being able to tolerate sleep deprivation and being able to do high level performance while tired is trainable like fitness or something, I think. (019)" Table 1** c. Fatigue is necessary for future practice (the first quote hopes he will be more rested, doesn't indicate it is necessary) **i. We have chosen an alternative, more salient quotation from the interviews to capture this category, "…the program and consultants will make that statement, saying, we need to have a residency program where our residents are tired, because they need to be trained for the situation when they're in their community or they're in an environment where they don't have the luxury of sleep." (013) Table 1** d. Fatigue is surmountable when required (the quotes do seem to say this) 2. p 12 line 10 to "distribute the workload" I'm not sure what the resident meant by this; it could actually be a recognition that workloads should be redistributed to avoid fatigue. **a. We hope this revision will provide clarification: "They described "filtering more to critical versus non-critical issues" (005), relying on "little check boxes" to remember details (017), delegating tasks amongst team members to "distribute the workload" when feasible (014), and going "into auto pilot" mode (010)." P.9** 3. I have attached a document with a few suggestions. a. These suggestions have been incorporated into the revisions highlighted in track changes b. Regarding the reviewer's comment, "Standard techniques – not specified in the cited references (18, 21)" **i. We substituted the original statement in the methods with a more detailed statement originally positioned in the Limitations (Interpretation) "To remain reflexively aware of how her insider experience informed the analysis, TT made regular memos and co-analyzed with non-insider members of the research team [18, 21]]. P.7** **ii. We have moved the original statement to the Limitations (Interpretation) section and revised as follows: "TT followed standard techniques for engaging in reflexivity while attending to her insider role throughout the analytical process [18, 21]. P.13-14** iii. Ref 21 – defines what it means to be an "insider" in a qualitative research context (p.58) and the legitimacy or acceptance that comes with this arrangement between researcher and participant. It also highlights some of the tensions that can arise if an insider researcher does not acknowledge the influence of his or her lived experience. iv. Ref 18 – Introduces the concept of reflexivity and standard techniques such as memo-writing and acknowledging preconceptions, which was facilitated by collaborating with "non-insiders" in our particular study. **c. Regarding the reviewer's comment, "Axial coding?" we have revised this portion of the transcript as follows: "We began our analysis with initial grounded theory coding with gerunds, followed by constant comparative analysis, which led to a more conceptual coding framework [18]" P.7** 4. Overall I think this is well written and makes its case. I believe the language regarding the four "principles" needs to be a bit more precise, or needs to correlate better with the quotes used. **a. We hope the revisions outlined above have addressed this point.**
Reviewer 2	Dr. Abraham Rudnick
Institution	University of British Columbia, Psychiatry
General comments (author response in bold)	This is overall a well written paper on an important topic - fatigue of medical specialists in training (residents). The rationale for the study is compelling and the study seems sound. A few revisions may improve the paper:

1. Some clarifications are needed, i.e., on page 7 in the 1st paragraph of the Methods section, explanation is needed re purposes of rigor, and elaboration is needed re standard techniques; on page 8, immediately after the sentence about REB approval, reference should be made to informed consent, e.g., whether it was obtained in writing; on page 8, in the 2nd paragraph of the Results section, elaboration is needed on professional identity constructs.
a. Purposes of rigor – We have elaborated on this in the manuscript as follows: "A co-investigator (LL – a non-clinician scientist) deliberately conducted one interview for the purposes of rigor, to ensure that TT's identity as a resident did not have a substantial impact on the information that participants chose to disclose during the open-ended interviews [20]." P.7
b. Standard techniques – We elaborated on the standard techniques for reflexivity in the Methods using the language from our account of these techniques in the Interpretation section. In the interest of word count, we referred to the standard techniques in the Interpretation. " To remain reflexively aware of how her insider experience informed the analysis, TT made regular memos and co-analyzed with non-insider members of the research team [18, 21]]. " P. 7, 13-14
c. We have added a sentence to describe how informed consent was obtained. It now reads "Informed consent was obtained in writing from each participant" P.7
d. Professional identity constructs – We have revised the paragraph containing this phrase in order to (a) elaborate on its meaning and (b) use participants' own words to avoid editorializing: "Residents reported that "recognizing that you are tired" was always in tension with "also recognizing that there is a job to be done" (018). In fact, some perceived that a goal of wellness was incompatible with the training they had chosen: "I am in this not to … how do I put it correctly? Not for wellness … I would have picked a different career. I'm in here to become a good doctor. The best way I can do that is to spend the hours seeing the things that need to be seen." (005) Such reflections suggest that understandings of fatigue were socially informed by tacit messaging and normative expectations about what residency is about." P.8
2. Qualification or reservation of some wording is needed to better align conclusions with study limitations, i.e., on page 11 in the 2nd last line, it may be better to replace the last word (are) with the word seem; on page 14 in the last line, it may be better to replace the words is unlikely to with the words may not.
a. The requested revisions have been made and the sentences now read as follows:
i. "These principles are more than individual beliefs; they seem to be deeply engrained in the local training culture." P.11
ii. "Under present conditions, the implementation of fatigue management strategies in residency training may not have a significant impact on resident fatigue or patient safety." P. 14
3. It could be informative although admittedly not conclusive (due to the small full sample size) to add a sub-analysis comparing procedural specialty residents such as in orthopedics to cognitive specialty residents such in psychiatry, even if full saturation is not achieved, as the experience and impact of fatigue may differ considerably across these 2 types of specialty residencies.
a. Although this is an interesting consideration, a sub-analysis would be inconsistent with our chosen methodology. We deliberately sampled from a diverse assortment of programs because we intended to capture varied perspectives on fatigue in residency training, recognizing that this is not meant to be representative of all residents.
4. A few linguistic errors should be corrected, i.e., on page 13 in the 6th line the word fatigue should be replaced by the word fatigued; on page 14 in the 1st line the word explicate should be replaced by the word extract or an equivalent word.
a. Both revisions have been made as requested

COREQ Checklist

No Item Guide questions/description
Domain 1: Research team and reflexivity
Personal Characteristics
1. Interviewer/facilitator Which author/s conducted the interview or focus group?
Interviews 001-016, 018-021 were conducted by TT while interview 017 was conducted by LL [methods]
2. Credentials What were the researcher's credentials? E.g. PhD, MD
TT – MD and PhD candidate
LL – PhD
3. Occupation What was their occupation at the time of the study?
TT – senior obstetrics and gynecology resident, PhD candidate and Clinical Investigator Program trainee
LL – Scientist, Director of Centre for Education Research & Innovation
4. Gender Was the researcher male or female?
Both researchers who performed the interviews are female
5. Experience and training What experience or training did the researcher have?
TT – Three years of experience in semi-structured interviewing while pursuing graduate studies
LL – PhD in Social Sciences and 20+ years of qualitative research experience in medical education
Relationship with participants
6. Relationship established Was a relationship established prior to study commencement?
TT – a minority of the participants had a previously established relationship with the interviewer

(colleagues in medical training)
LL – no relationship with the participant was established prior to study commencement, however the participant had a previously established relationship with TT (former classmate)
7. Participant knowledge of the interviewer What did the participants know about the researcher? e.g. personal goals, reasons for doing the research
TT – all participants knew that TT was a resident enrolled in the obstetrics & gynecology program at the local institution. They understood that the research was part of TT's PhD thesis.
LL – participant knew that LL was TT's PhD supervisor and was a Scientist in the field of medical education
8. Interviewer characteristics What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic
TT – acknowledged to be a resident at one of the hospitals (methods) with lived experience that informed the analysis (limitations)
LL- acknowledged her role as a non clinician scientist
Domain 2: study design
Theoretical framework
9. Methodological orientation and Theory What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis
Constructivist grounded theory (methods)
Participant selection
10. Sampling How were participants selected? e.g. purposive, convenience, consecutive, snowball
Convenience to purposive and then theoretically sampling to sufficiency [methods]
11. Method of approach How were participants approached? e.g. face-to-face, telephone, mail, email
Recruitment involved email and face-to-face invitations approved by each program director. [methods]
12. Sample size How many participants were in the study?
Twenty-one [methods and results]
13. Non-participation How many people refused to participate or dropped out? Reasons?
Residents across all of the sampled programs received an email and an open invitation to participate during an academic half day, but only those who were interested in being interviewed either responded to the email or provided their email address during the academic half-day invitation. Four individuals who responded to the email or invitation and completed the informed consent process were not interviewed because of scheduling conflicts.
Setting
14. Setting of data collection Where was the data collected? e.g. home, clinic, workplace
The data was collected either in the workplace or over the telephone, at the participant's convenience.
15. Presence of non-participants Was anyone else present besides the participants and researchers?
No non-participants were present during data collection
16. Description of sample What are the important characteristics of the sample? e.g. demographic data, date
Twenty-one participants were sampled from a range of postgraduate years (1-7) and included 13 male residents, 12 married residents, 6 residents with children and 13 senior-level residents, as defined by the individual programs. [results]

Data collection
17. Interview guide Were questions, prompts, guides provided by the authors? Was it pilot tested?
Final interview guide is appended to the revised submitted manuscript. In keeping with grounded theory methodology, our interview guide evolved alongside our iterative analysis. This meant that as certain themes reached sufficiency, we modified our interview guide to try and explore discrepant cases and situations to further enrich the analysis. [methods]
18. Repeat interviews Were repeat interviews carried out? If yes, how many?
We did not carry out any repeat interviews
19. Audio/visual recording Did the research use audio or visual recording to collect the data?
All interviews were audio recorded (with accompanying field notes collected by the interviewer) and the recordings were transcribed. [methods]
20. Field notes Were field notes made during and/or after the interview or focus group?
Field notes were made during the interview and then summarized following the interview, which often led to analytical memos
21. Duration What was the duration of the interviews or focus group?
Each interview lasted 30-60 min
22. Data saturation Was data saturation discussed?
In the methods section, we acknowledged that our sampling continued until sufficiency was achieved (Ref 19) [methods]
23. Transcripts returned Were transcripts returned to participants for comment and/or correction?
We did not return transcripts to participants for comment or correction because they were anonymized at the time of transcription.
Domain 3: analysis and findingsz
Data analysis
24. Number of data coders How many data coders coded the data?
All transcripts were coded by TT; however, LL, CW, TD and PT read a sample of transcripts and

provided analytical insights that informed coding.
25. Description of the coding tree Did authors provide a description of the coding tree?
We did not provide a description of the coding tree. The coding tree represents the full analysis. Only the theme of principles of fatigue is produced in this paper, therefore we did not incorporate the full coding tree. We could provide the subsection relevant to this paper's focus if necessary.
26. Derivation of themes Were themes identified in advance or derived from the data?
Themes were identified from the data. We did not use template analysis. [methods]
27. Software What software, if applicable, was used to manage the data?
NVivo and MindNodePro
28. Participant checking Did participants provide feedback on the findings?
We did not perform member checking
Reporting
29. Quotations presented Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.g. participant number
Participant quotations are provided in the results to illustrate themes/findings with each quotation identified by anonymized participant number.
30. Data and findings consistent Was there consistency between the data presented and the findings?
To ensure that the examples are maximally illustrative of the findings, we have provided alternative, more salient quotations from the interview transcripts (outlined in response to reviewers)
31. Clarity of major themes Were major themes clearly presented in the findings?
Our results present the major themes, which are collated in Table 1 with representative quotations.
32. Clarity of minor themes Is there a description of diverse cases or discussion of minor themes?
Discrepancies across the four principles of fatigue are discussed in the final paragraph of the results section before Interpretation.

http://intqhc.oxfordjournals.org/content/19/6/349.long

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. International Journal for Quality in Health Care, 19(6), 349-357.

Final Interview Guide

1. What does a busy call shift look like for you?

2. How do you organize your call shift when it's busy? (e.g. How do you decide what to do first?)

3. If you realize that you can't do it all, how do you decide what to defer or postpone?

4. How do you decide if a task is unnecessary?

5. Does that look any different when you're not on call?

6. Have you ever felt unsafe? (When do you feel unsafe?)

7. Are their certain parts of your job that you perform just as safely (effectively), whether it's during the daytime or while on call at night?
a. Has this always been the case, or was it different when you were earlier in your residency?

8. Some residents have said that when they're postcall, they would feel safe to perform certain clinical duties but not others – what are your thoughts about this?

9. Looking to the future, how will you decide what to do on your postcall days? (What do your staff routinely do?)

10. What advice would you give to a more junior resident about how to handle their call shift?

a. If there's more to do than you can do – rationales
b. How do you decide what is unnecessary
c. When to ask to help and who to ask and how to ask for help?

11. If you take call with a junior resident – do you consider the junior's level of safety when delegating tasks?