



Views of doctors of varying disciplines on HPAT-Ireland as a selection tool for medicine

Maureen E. Kelly, Niamh Gallagher, Fidelma P. Dunne & Andrew W. Murphy

To cite this article: Maureen E. Kelly, Niamh Gallagher, Fidelma P. Dunne & Andrew W. Murphy (2014) Views of doctors of varying disciplines on HPAT-Ireland as a selection tool for medicine, Medical Teacher, 36:9, 775-782, DOI: [10.3109/0142159X.2014.909012](https://doi.org/10.3109/0142159X.2014.909012)

To link to this article: <http://dx.doi.org/10.3109/0142159X.2014.909012>



Published online: 07 May 2014.



Submit your article to this journal [↗](#)



Article views: 91



View related articles [↗](#)



View Crossmark data [↗](#)

Views of doctors of varying disciplines on HPAT-Ireland as a selection tool for medicine

MAUREEN E. KELLY¹, NIAMH GALLAGHER^{1,2}, FIDELMA P. DUNNE¹ & ANDREW W. MURPHY¹

¹National University of Ireland, Ireland and ²Health Service Executive, Ireland

Abstract

Background: Selection tools for medicine must achieve political validity and enjoy stakeholder acceptability. This qualitative study aimed to establish the perspectives of doctors, from various clinical specialities, on HPAT-Ireland, a new selection tool for undergraduate medical students.

Methods: Fifteen doctors participated over three iterative cycles of recruitment, interviewing and analysis. Prior to interview, participants sat a practice HPAT-Ireland test. HPAT-Ireland has three sections: (1) Logical reasoning/problem solving; (2) Interpersonal understanding and (3): Non-verbal reasoning.

Summary of results: Three themes emerged: job relatedness; utility of HPAT-Ireland and diversity. Sections 1 and 2 were considered very job related however Section 3 was widely criticised for lacking clinical relevance. Doctors did not think that the test would reliably predict future performance. However, one-third felt it was acceptable as a selection tool in conjunction with academic record. Those who found it unacceptable were influenced by its perceived narrow focus, limited job relatedness, potential for socioeconomic bias, impact on gender and potential for negative influence on student diversity.

Conclusions: A selection tool that does not enjoy the confidence of the medical profession is unlikely to achieve political validity and may ultimately fail, regardless of other objective measures of its effectiveness such as predictive validity.

Introduction

The British Medical Journal in 1946 highlighted the challenges of medical student selection, considering them “*formidable*” (Smyth 1946). Medical schools internationally still struggle to identify selection tools which meet the demands of credibility, fairness, validity and reliability (Prideaux et al. 2011). More recently, the requirements of good selection tools have expanded to include political agendas such as widening diversity and future workforce planning (Cleland et al. 2013).

Stakeholder acceptability receives less academic attention but generates much public interest (Beckett 2008; Nelligan 2009; Henry 2010; McDonagh 2010; Molloy 2010; Cresswell 2011). Acceptability is highly influential and can determine if a selection tool achieves widespread use or otherwise (Murphy et al. 2008). For example, traditional interview and personal statements remain popular despite poor reliability and validity records (O’Flynn 2010). Stakeholder acceptance and positive student reactions are amongst the recognised standards for judging the quality of a selection tool (Patterson & Ferguson 2008)

Job-relatedness refers to the extent to which a selection tool measures job content or is perceived to be a valid predictor of job performance (Tippins & Seymour 2011). In order to be legally defensible selection tools for employment need to tie directly to the requirements of the target job (Aamodt 2011). Regarding medical student selection information on how selection test items blueprint against the professional

Practice points

- This study found that acceptability of HPAT-Ireland varied considerably across participants, with just a little less than half finding it acceptable as a selection tool.
- Participants’ views on job relatedness, impact on student diversity and socioeconomic fairness were key to its acceptability.
- Measures to improve job relatedness and lessen negative impact on student diversity could enhance the acceptability of HPAT-Ireland to the medical profession.

competencies of medical graduates are often omitted from the literature hence the relevance of certain tests may not be apparent to stakeholders (Patterson et al. 2012).

Aptitude tests, or tests of general mental ability, remain amongst the most popular selection tools in use. Confidence in these tools has been undermined by conflicting reports of predictive validity and concerns over stakeholder acceptability (Julian 2005; Cassidy 2008; James et al. 2010; Wright & Bradley 2010; Cleland et al. 2011; Poole et al. 2012).

The Health Professions Admission Test Ireland (HPAT-Ireland) (ACER 2013) was introduced in 2009 with the intention of widening access to medical school, removing the sole reliance on academic achievement and bringing Irish

Correspondence: Dr. Maureen Kelly, Discipline of General Practice, Clinical Science Institute, NUI Galway, Galway, Ireland. Tel: +353 91 493524. Fax: +353 91 494559. E-mail: maureen.kelly@nuigalway.ie

medical schools' recruitment policy in line with international norms (Fottrell 2006). It is similar to the Undergraduate Medical Admissions Test (UMAT). A full description of HPAT-Ireland, comparisons with other aptitude tests and reports of its predictive validity are reported elsewhere (Kelly et al. 2013).

The introduction of HPAT-Ireland met with strongly voiced criticism in the national media. Concerns were raised about the potential for cost to act as a barrier to socioeconomic disadvantaged applicants and possible gender bias, with the popular view holding that males would out-perform females (Donnelly & Heffernan 2011; Murray 2011; RTÉ 2012).

One study of stakeholder acceptability: a survey of doctors' knowledge and opinion of HPAT-Ireland has been published (Dennehy et al. 2013). In this study, 75% of respondents reported they had little or no knowledge of HPAT-Ireland content, while 70% supported the use of aptitude tests in selection.

Study aim

This study aimed to establish the perspectives of doctors from a range of specialities on HPAT-Ireland, explore the degree to which the skills measured were considered to be job related, and establish opinions on its acceptability as a selection tool.

Methods

The study design was qualitative, drawing on the broad precepts and techniques of the grounded theory tradition; a popular methodology used in medical education research (Glaser & Strauss 1967; Harris 2002). Medical student selection has been identified as an area that would benefit from more widespread use of "grounded theory approaches" (Harris 2003). We employed purposeful sampling, an iterative approach to data generation and analysis and the constant comparison technique. Data were coded and categorised using the three-step process of open, axial and selective coding supported by detailed memoing (Corbin & Strauss 2008).

Following ethical approval and a pilot study the main study was carried out in the School of Medicine, NUI Galway and the Western Research and Education Network (WestREN) (www.western.nuigalway.ie). To ensure that study participants were fully informed of the content of HPAT-Ireland, they first sat a full sample paper under examination conditions. As qualified doctors are not the target audience for HPAT-Ireland, comparisons of scores with school leavers are largely unfounded hence individual participant scores are not reported.

Sampling and recruitment

Demographics factored into a purposeful sampling framework comprised: gender, age, specialty and experience in medical education (Coyne 1997). Sample size was guided by the data saturation principle (Lincoln & Guba 1985). Sixty-one doctors were invited to participate; 23 agreed however 8 of these opted out due to clinical commitments, 1 declined and no response was received from the remainder.

Study participants

Fifteen doctors took part (nine male: six female). Participants were assigned an alphabetical code. See Box 1 for outline of sample demographics.

Data generation

In Phase I, participants sat the practice HPAT-Ireland test. See Box 2 for details of HPAT-Ireland. Each participant received a corrected copy of his/her paper.

In Phase II, semi-structured interviews (May 2001) were conducted by MK. The topic guide was developed and informed by the study objectives (Rubin & Rubin 2004), relevant literature (Roberto et al. 2005) and ongoing analysis (Corbin & Strauss 2008) (Appendix 1). Interviews took place in NUI Galway or the participant's workplace, lasted between 40 and 60 min, were audio-taped and transcribed verbatim. Participants were given an opportunity to amend the views

Box 1. Demographics of study participants.

	Total	Males	Females	Age in years	Speciality	Special interest in medical education
Pilot study	<i>n</i> = 3	<i>n</i> = 2	<i>n</i> = 1	40–49: <i>n</i> = 1 50–59: <i>n</i> = 1 age > 60: <i>n</i> = 1	3 general practitioners	<i>n</i> = 2
Cycle 1	<i>n</i> = 4	<i>n</i> = 4	<i>n</i> = 0	40–49: <i>n</i> = 2 50–59: <i>n</i> = 2	2 General practitioners 1 Paediatrician 1 Psychiatrist	<i>n</i> = 1
Cycle 2	<i>n</i> = 6	<i>n</i> = 5	<i>n</i> = 1	20–29: <i>n</i> = 1 30–39: <i>n</i> = 3 40–49: <i>n</i> = 1 age > 60: <i>n</i> = 1	1 Paediatrician 1 Surgeon 1 Clinical pathologist 1 Nephrology registrar 2 Clinical lecturers in medicine	<i>n</i> = 4
Cycle 3	<i>n</i> = 5	<i>n</i> = 0	<i>n</i> = 5	30–39: <i>n</i> = 1 40–49: <i>n</i> = 4	1 General practitioner 1 Psychiatrist 1 Paediatrician 1 Radiologist 1 Clinical lecturer in paediatrics	<i>n</i> = 2

Box 2. Description of HPAT-Ireland subsections according to ACER.

Sections	Duration	No. of questions	Description (all MCQ type questions)
Section 1. Logical reasoning and problem solving	65 min	44	Questions based on a passage of text or a diagram presenting certain information. Applicants are required to analyse and logically reason through the information presented.
Section 2. Interpersonal understanding	45 min	36	Questions based on a scenario representing specific interpersonal situations. Applicants have to identify, understand, and, where necessary, infer the thoughts, feelings, behaviour and/or intentions of the people represented in the situations.
Section 3. Non-verbal reasoning	40 min	30	Questions based on recognition of patterns and sequences of shapes. The questions test the applicant's ability to reason in the abstract and solve problems in non-verbal contexts.
Total test time	2½h		

expressed in their interviews following knowledge of their HPAT-Ireland score; however no participant did so.

Data analysis

Open coding was conducted independently by MK and AWM. Descriptions of codes and emerging themes were discussed and agreed upon with the other authors and the remaining interviews were conducted and coded in an iterative fashion. N-Vivo10 software was used (QSR International 2012).

Quality and rigour

Open questions, summarising and clarification were employed during interviews to encourage the doctors to fully express their views (Patton 2002). Member checking was carried out with a random sample of participants to ensure that participants' views were accurately represented (Carlson 2010) (Appendix 2). To facilitate reflexivity, a coding diary was kept (Corbin & Strauss 2008). To ensure fair dealing, care was taken not to over emphasise the views of any one group of participants and specific attention was paid to both seeking and understanding "deviant" views (Pope & Mays 2006).

Results

Three main themes emerged.

Theme 1: Job relatedness

Section 1: Logical reasoning and problem solving

Four-fifths of participants agreed that Section 1 resonated to a "moderate" (Dr C) degree with clinical practice:

"... I think it's [Section 1] assessing something that's an important quality, that physicians and surgeons, or psychiatrists... require, and that's interpreting data" (Dr P).

Section 1 was considered "time-pressured" (Dr V) and "very difficult" (Dr E) – features which were thought to indirectly test prioritisation, coping with stress and time-management.

Three doctors, from different clinical specialities, disagreed and felt that Section 1 "was more to do with scientific and literature review rather than clinical reasoning" (Dr J).

Suggestions for improvement included reducing the number of questions in Section 1 and constructing the questions so that they could "... give you the same information much more concisely" (Dr V).

Section 2: Interpersonal understanding

There was consensus that Section 2 tested "emotional reasoning" (Dr M) and "... insight into the way we think and just understanding people" (Dr R) and almost unanimous agreement across all specialities that it resonated the most with clinical practice.

This was considered distinct from testing communication skills: "... communication is a huge skill that doctors need ... but you can't really test that in a paper format" (Dr W).

Many suggested "expand[ing] the middle section" (Dr X), to include analysis of a "video or even an auditory clip" (Dr P) which would be "a more realistic way of assessing interpretative empathic skill(s)" (Dr J).

One participant was especially critical of Section 2: "[it was] a missed opportunity... it could have tested... personality factors that may be of relevance to picking future doctors... especially the attitudes of the candidate" (Dr D).

Section 3: Non-verbal reasoning

Section 3 baffled participants irrespective of gender, speciality or age. They struggled to identify which skill it actually tested and although many suggested it was concerned with "pattern recognition" (Dr X) a couple were left "not even sure what it's testing..." (Dr S)

There was unanimous agreement that Section 3 was the least job related section.

"Section 3 really eluded me as to where that was in relevance in terms of medicine at all" (Dr H)

The most common suggestion for improvement was to "get rid of the third section." (Dr P) and in its place "expand the middle section [Section 2]" (Dr X).

There were a number of key skills and attributes that participants felt were important to succeeding in medical school and becoming a doctor that were not tested including “*stamina*” (Dr C), “*focus, attention to detail, dedication, persistence*” (Dr X) and “*really hard work*” (Dr Y). These relate to the theme on utility below.

Theme 2: Diversity

Gender, age and maturity

There was broad awareness of media coverage of potential gender bias across the specialities, gender and age groups of participants. Participants considered it “... *a complex assessment for either male or female candidates*” (Dr V). A third of participants thought that “*boys may do better on Section 3*” (Dr H) and “*women would do better*” (Dr C) on Section 2. Yet, there was no perception that the overall test was likely to be gender biased. There was consensus that HPAT-Ireland was “*very challenging for a seventeen/eighteen year old... it seemed to be looking for a fair degree of maturity*” (Dr J).

Socio-economic group

Participants were concerned that socioeconomic background could impact on applicant performance on HPAT-Ireland through access to commercial coaching:

“*You have to play fair... you do better if you repeat it or if you get loads of grinds.*” (Dr Y).

Participants appreciated that one of the reasons for introducing HPAT-Ireland was to “... *try and diversify intake*” (Dr J). However, they did not think that HPAT-Ireland would “... *have much effect on [widening]diversity, because no matter what system you put in place, the articulate middle classes will jump that particular burdle*” (Dr J).

Student skills

Participants felt that HPAT-Ireland may favour applicants with strong logical, analytical and reasoning skills, potentially reducing student diversity at a potential cost to the profession: “*So if you look at advances in medicine, its often the most creative people that come up with the most ingenious solutions*” (Dr K).

Theme 3: Utility of HPAT-Ireland

Interpreting HPAT-Ireland results

Almost two-thirds of participants likened HPAT-Ireland to a standard “*aptitude [test]*” (Dr Y) and interpreted the result predominately as a measure of one’s “*logical reasoning*” (Dr Y) abilities. The majority were struck by the extent to which it tested a “*different set of skills*” (Dr E) to the Leaving Certificate, the Irish state run secondary school exit exam.

Participants wondered “... *if you were good at the HPAT does that mean that you’ll be a good doctor, if you were bad at the HPAT does that mean that you will be... a bad doctor?*” (Dr W).

In response, the majority were “*reluctant to put too much weight...*” (Dr C) on the result of HPAT-Ireland for a number of reasons. It was not considered “*specifically geared at medical [selection]*” (Dr Y); there was doubt that performance on paper would match performance in clinical situations and it was considered a very “*tall order*” (Dr J) for a selection tool to reliably predict future performance “... *when you think of the diversity of doctors and the varied skills they actually need, so such a test in my opinion doesn’t exist, never has and presumably never will.*” (Dr H).

Factors such as the quality “... *of under graduate training*” (Dr V), the “*enthusiasm and motivation*” (Dr K) of the student and the omitted skills referred to in Theme 1 all had an important role to play.

Acceptability of HPAT-Ireland as a selection tool for medicine

Acceptability of HPAT-Ireland as a selection tool varied. Participant’s clinical speciality, age or gender did not appear to consistently influence opinions.

Seven participants found it broadly acceptable however many of these remained sceptical of its ability to select good future doctors. These participants considered that HPAT-Ireland “*tests a different set of skills*” (Dr E) to the Leaving Certificate, was in keeping with “*international*” (Dr S) norms and “*levelled the playing field*” (Dr H) in terms of combining it with applicants’ academic record.

“... *it’s just one more tool to allow you to select from a very good cohort of students*”. (Dr S)

Four participants were opposed to HPAT-Ireland because they perceived it to have limited predictive validity, potential for socioeconomic bias and that it was an “*extra burdle to jump over*” (Dr V). One doctor was particularly opposed to it “... *I think it falls far short [as a selection tool]... as a matter of fact I think it’s both random and dangerous*” (Dr D).

Four participants remained “*undecided*” (Dr Q) about its role and acceptability. This group reserved judgement until “*more research and evidence*” (Dr Q) emerges to inform the debate one way or the other: “*So, I think it was a noble attempt to try and check different things, and time will tell whether it has achieved that or not*” (Dr J).

Discussion

The degree to which a selection tool measures skills considered to be job related impacts greatly on stakeholder acceptability. One of the strength of this study is that participants sat HPAT-Ireland, ensuring that opinions were informed by knowledge of the test. Perceptions of its job relatedness were based on the skills participants used to complete HPAT-Ireland (response process) and the degree to which those skills resonated with their clinical practice (content evidence), two of the five sources of evidence for construct validity (Downing 2003). Adequate construct validity is a requirement of good selection tools and is defined as the extent to which a tool measures the construct that it is intended

to measure (Cleland et al. 2013). Powis (1994) describes the construct being tested as suitability to “*become good medical students... and ultimately good doctors*”.

Section 2 was thought to test skills that relate well to those used by doctors. Hence this section was deemed most “job related” by participants across all specialities, gender and ages reflecting the central role of interpersonal communication in medicine. Participants recommended expanding the section to provide a more comprehensive test of interpersonal skills. Lievens & Sackett (2012) established that Situational Judgement Tests of interpersonal skills show acceptable predictive validity for future job performance and these could be readily incorporated into HPAT-Ireland. One participant criticised Section 2 for missing the opportunity to assess personality factors. In their comprehensive model for the selection of medical students, Bore et al. (2009) argue for the inclusion of personality factors on the grounds that in the workplace they have incremental predictive validity over cognitive abilities alone. Adam et al. (2012) demonstrated a range of weak to moderate correlations between written tests of personality factors and student examination results and outcomes of tutor assessments. A recent review (Cleland et al. 2013) concludes that personality assessment may provide a moderate level of predictive validity, however, more research is required particularly with regard to stakeholder acceptability.

Section 1 resonated to a moderate degree with practice although the intricacies of clinical reasoning were deemed different to those of general logical reasoning. Interestingly, the indirect concerns of time management, coping under pressure and prioritisation were considered congruent with the demands of clinical practice. However their relevance might not be obvious to medical school applicants. Thorough explanation of the rationale supporting test items has been shown to positively impact on test acceptance (Patterson et al. 2011).

Section 3 did not find favour with the doctors in this study. According to ACER(b) 2007 the main reason for assessing non-verbal reasoning is to gain a measure of cognitive ability independent of language ability and specific cultural knowledge. However participants in this study struggled to find any resonance with clinical practice and hence did not see the relevance of this section. Participants were also concerned that coaching could improve performance presenting an additional barrier to applicants from lower socio-economic groups. There is evidence that coaching improves performance on Section 3 of both HPAT-Ireland (O’Flynn et al. 2012) and UMAT (Griffin et al. 2008, 2012). Hence there is a strong argument for removing this section entirely from the paper.

“*Consequential*” evidence requires that selection tools do more good than harm and is a measure of their effect on applicants, faculty, patients and society (Downing 2003). A motivation for introducing HPAT-Ireland was widening diversity. Doctors in this study did not consider that HPAT-Ireland would achieve this aim, a view supported by enrolment data which has not demonstrated any change in the socioeconomic background of candidates since its introduction (O’Flynn et al. 2012). Lack of diversity however may reflect the *applicant pool* (O’Neill et al. 2013). A study of UK

teenagers, found that academically able students from lower socio-economic backgrounds, viewed medicine and university as alien to them and restricted to “*posh*” people (Greenhalgh et al. 2004). Further consideration needs to be given to school outreach workshops, mentoring programmes, fostering links with disadvantaged schools and expansion of special access routes.

Participants’ concerns about the potential impact of gender on performance were restricted to applicant performance on test subsections, which tended to balance out between Sections 2 and 3. This is in keeping with reports which have not demonstrated a significant gender discrepancy in *overall* HPAT-Ireland results but do indicate that males slightly outperform females on Sections 1 and 3 (O’Flynn et al. 2013). Similar patterns exist with the UMAT (Griffin et al. 2012). Selection tools that are *perceived* as unfair can deter potential medical students from applying which would be considered a profoundly negative consequential effect (Patterson et al. 2012).

Test validity is a measure of the weight of evidence that supports the *interpretation* of results for a *given purpose* at a *certain time* (Downing 2003). It was the predominant view of doctors in this study that scores on HPAT-Ireland should not be interpreted as a measure of applicants’ likelihood to be a good doctor. Academic record is no longer considered sufficient grounds for selection (Powis 2010) due in part to potential for socioeconomic bias and diminished ability to differentiate between top performing applicants. It is in this respect that HPAT-Ireland received moderate acceptability amongst study participants as a tool to further enable rank ordering of applicants. This interpretation and use is not fully in keeping with testing the construct according to Powis (1994) and may be at odds with the perception of the general public. Consideration of alternative adjunct selection tools including Multiple Mini Interview or Situational Judgement Tests which may have better predictive profiles and hence be more likely to fulfil both aspects of the construct is worthy of more open discussion and debate.

Political validity differs from construct validity in that it is a measure of the extent to which these stakeholders consider the tool to be appropriate for use in selection (Cleland et al. 2013). Acceptability, job relatedness *and* the interpretation of applicant performance on the selection tool are all important determinants of political validity.

Limitations of this study include that for pragmatic reasons most doctors were interviewed prior to receiving their marked HPAT-Ireland paper. Although no participant wished to amend their original interview after receiving their results, it is possible that this may have altered their views. Secondly, although this study utilised many of the broad precepts and key techniques of grounded theory analysis it is not a grounded theory study per se. Elsewhere, it has been accepted that the grounded theory approach can be justified without the generation of a theory as long as it is acknowledged that this was not the express intention of the work (Carter 1999; Coyne & Cowley 2006). In accordance with current recommendations, we have clearly outlined which aspects of grounded theory were employed (Kennedy & Lingard 2006).

Conclusions

Due to the high stakes nature of medical student selection there are many stakeholder groups of which the medical professions itself is a key one. Doctors were critical of the lack of clinical relevance of Section 3 and the potential for negative impact on diversity. Improvements to test design could impact positively on its job relatedness and subsequent acceptability. A selection tool that does not enjoy the confidence of the medical profession is unlikely to achieve political validity and may ultimately fail, regardless of other objective measures of its effectiveness such as predictive validity. Almost 70 years on the task of selection remains “*formidable*” (Smyth 1946).

Glossary

Political validity: “An indication of the extent to which various stakeholders and stakeholder groups consider the tool(s) to be appropriate and acceptable for use in selection” (taken from Cleland et al. 2013).

Consequential validity: “Refers to the impact on examinees of the assessment scores, decisions and outcomes, and the impact of assessments on teaching and learning” (taken from Downing 2003).

Notes on contributors

All authors made substantial contributions to study conception, design, interpretation of findings, write up and approval of final paper for submission. M.K. and A.W.M. conducted open coding, with all authors contributing to the development of axial codes and subsequent themes. N.G. provided guidance on qualitative methodology. M.K. was principal investigator.

MAUREEN E. KELLY, MB BCh BAO, MICGP, FRCGP, M Med Ed, is a Lecturer in General Practice, NUI Galway and Assistant Director of the Western Postgraduate Training Programme in General Practice.

NIAMH GALLAGHER, PhD, is Senior Speech & Language Therapist, HSE West and Honorary Research Fellow, NUI Galway

FIDELMA P. DUNNE, MD, PhD, FICCP, FRCPI, Dip Med.Ed, is a Consultant Endocrinologist, Personal Professor of Medicine and recent Head of the Medical School, NUI Galway.

ANDREW W. MURPHY, MB MD FRCGP MICGP DCH DIMC(RSC) MCLinEpi, is Head of Discipline of General Practice, and practising GP.

Acknowledgements

We sincerely thank the doctors who gave up their time to take part in this study: Dr S O Flynn for advice on study design and Dr G McGuire who commented on the final draft of this article.

Declaration of interest: F.D. is a member of the National Research Group Evaluating Entry and Selection to Medical Schools. This group comprises Deans and Heads of Medical Schools and is broadly evaluating the impact of the changes to Irish medical student selection criteria. Funding of €10 000 was granted via a competitive process for a larger Mixed Methods Programme of Research on Medical Student Selection and a further €1000 was also awarded by WestREN to conduct

the initial pilot study. The authors wish to acknowledge our funders the Western Research and Education Network (WestREN), Galway (www.western.nuigalway.ie).

References

- Aamodt MG. 2011. Industrial/organizational psychology: An applied approach. Chapter 3. California: Cengage Learning.
- ACER. 2007. Australian Council for Educational Research; UMAT A Validity Study. [Accessed 27 January 2014] Available from <http://umat.acer.edu.au/umat-research>.
- ACER. 2013. Australian Council for Educational Research HPAT-IRELAND-Ireland. Health Professions Admission Test – Ireland. [Accessed 1 October 2013] Available from <http://www.hpat-ireland.acer.edu.au/>.
- Adam J, Bore M, McEndree J, Munro D, Powis D. 2012. Can personal qualities of medical students predict in-course examination success and professional behaviour? An exploratory prospective cohort study. *BMC Med Educ* 12:69. [Accessed 16 January 2014] Available from <http://www.biomedcentral.com/1472-6920/12/69>.
- Beckett J. 2008. The university admissions process is still deeply flawed *The Guardian Education* [Internet] February 13. [Accessed 1 October 2013] Available from <http://www.theguardian.com/education/2008/feb/13/highereducation.news>.
- Bore M, Munro D, Powis D. 2009. A comprehensive model for the selection of medical students. *Med Teach* 31(12):1066–1072.
- Carlson JA. 2010. Avoiding traps in member checking. *Qual Rep* 15(5):1102–1113.
- Carter S. 1999. An introduction to qualitative methods for health professionals. London: Royal College of General Practitioners.
- Cassidy J. 2008. Medical education: UKCAT among the pigeons. *Br Med J* 336(7646):691.
- Cleland J, Dowell J, McLachlan J, Nicholson S, Patterson F. 2013. Identifying best practice in the selection of medical students. *UK General Medical Council: February*. [Accessed 1 October 2013] Available from <http://www.gmc-uk.org/about/research/14400.asp>.
- Cleland JA, French FH, Johnston PW. 2011. A mixed-methods study identifying and exploring medical students' views of the UKCAT. *Medl Teach* 33(3):244–249.
- Corbin J, Strauss A. 2008. Basics of qualitative research: Techniques and procedures for developing grounded theory. Thousand Oaks, CA: Sage Publications.
- Coyne IT. 1997. Sampling in qualitative research. Purposeful and theoretical sampling; merging or clear boundaries? *J Adv Nurs* 26(3):623–630.
- Coyne I, Cowley S. 2006. Using grounded theory to research parent participation. *J Res Nurs* 11(6):501–515.
- Cresswell A. 2011. Selection exam shown to be poor guide to university performance *The Australian* [Internet] April 4. [Accessed 1 October 2013] Available from <http://www.theaustralian.com.au/news/nation/selection-exam-shown-to-be-poor-guide-to-university-performance/story-e6frg6nf-1226032925914>.
- Dennehy T, Kelly M, O'Flynn S. 2013. General Practitioners' perspectives on revised entry and selection mechanisms to medicine and the HPAT. *Ir Med J* 106(4):113–116.
- Donnelly K, Heffernan B. 2011. Medicine points still out of reach as aptitude test deemed a failure. *Irish Independent*. 22/08. [Accessed 1 October 2013] Available from <http://www.independent.ie/lifestyle/education/latest-news/medicine-points-still-out-of-reach-as-aptitude-test-deemed-a-failure-2854097.html>.
- Downing S. 2003. Validity: On the meaningful interpretation of assessment data. *Med Educ* 37(9):830–837.
- Fottrell P. 2006. Medical education in Ireland: A new direction. Report of the Working Group on Undergraduate Education and Training (the Fottrell Report). Department of Health and Children, Dublin. [Accessed 1 October 2013] Available from <http://www.dohc.ie/publications/fottrell.html?lang=en>.
- Glaser BG, Strauss AL. 1967. The discovery of grounded theory: Strategies for qualitative research. Chicago: Aldine.

- Greenhalgh T, Seyan K, Boynton P. 2004. "Not a university type": Focus group study of social class, ethnic, and sex differences in school pupils' perceptions about medical school. *Br Med J* 328(7455):1541.
- Griffin B, Carless S, Wilson I. 2012. The effect of commercial coaching on selection test performance. *Med Teach* 35(4):295–300.
- Griffin B, Harding DW, Wilson IG, Yeomans ND. 2008. Does practice make perfect? The effect of coaching and retesting on selection tests used for admission to an Australian medical school. *Med J Aust* 189(5):270–273.
- Harris I. 2002. Qualitative methods. In: Norman G, Van der Vleuten C, editors. *International handbook of research in medical education*. Amsterdam: Kluwer. pp 45–95.
- Harris I. 2003. What does "The discovery of grounded theory" have to say to medical education? *Adv Health Sci Educ* 8(1):49–61.
- Henry M. 2010. *Securing a place in medicine*. Dublin: The Irish Times Letters to the Editor.
- James D, Yates J, Nicholson S. 2010. Comparison of A level and UKCAT performance in students applying to UK medical and dental schools in 2006: Cohort study. *BMJ* 340:478.
- Julian ER. 2005. Validity of the medical college admission test for predicting medical school performance. *Acad Med* 80(10):910–917.
- Kelly ME, Regan D, Dunne F, Henn P, Newell J, O'Flynn S. 2013. To what extent does the Health Professions Admission Test-Ireland predict performance in early undergraduate tests of communication and clinical skills? – An observational cohort study. *BMC Med Educ* 13(1):68.
- Kennedy T, Lingard L. 2006. Making sense of grounded theory in medical education. *Med Educ* 40(2):101–108.
- Lievens F, Sackett P. 2012. The validity of interpersonal skills assessment via situational judgment tests for predicting academic success and job performance. *J Appl Psychol* 97(2):460.
- Lincoln YS, Guba EG. 1985. *Naturalistic inquiry*. Beverly Hills, CA: Sage.
- May T. 2001. *Social research: Issues methods and process*. Buckingham: Oxford University Press.
- McDonagh S. 2010. *Securing a place in medicine*. Dublin: The Irish Times Letters to the Editor.
- Molloy P. 2010. *Securing a place in medicine*. Dublin: The Irish Times Letters to the Editor.
- Murphy D, Bruce D, Eva K. 2008. Workplace-based assessment for general practitioners: Using stakeholder perception to aid blueprinting of an assessment battery. *Med Educ* 42(1):96–103. [Accessed 1 October 2013] Available from <http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2923.2007.02952.x/pdf>.
- Murray N. 2011. More students with lower leaving cert points get medicine. *Irish Examiner*.23/08. [Accessed 1 October 2013] Available from <http://www.irishexaminer.com/ireland/more-students-with-lower-leaving-cert-points-get-medicine-165133.html>.
- Nelligan M. 2009. *Selecting our future doctors*. Dublin: The Irish Times.
- O'Flynn S. 2010. Entry and selection to medical school – do we know what we should measure and how we should measure it? *Med Educ* 2010: 17–29.
- O'Flynn S, Mills A, Fitzgerald T. 2012. Interim report on school-leaver entrants to medicine. National Research Group Evaluating Revised Entry Mechanisms to Medicine. July [Accessed 1 October 2013] Available from <http://www.ucd.ie/t4cms/HPAT-report-July2012.pdf>.
- O'Flynn S, Mills A, Fitzgerald AP. 2013. Entry to medical school a the gender question. What has happened? *Ir Med J* 106(8):230–232.
- O'Neill L, Vonsild M, Wallstedt B, Dorman T. 2013. Admissions and diversity in medical school. *Med Educ* 47(6):557–561.
- Patterson F, Ferguson E. 2010. Selection for Medical Education and Training, in Swanwick T (ed.), *Understanding Medical Education: Evidence, Theory and Practice*. (pp. 352–365). Chichester: Wiley-Blackwell.
- Patterson F, Lievens F, Kerrin M, Zibarras L, Carette B. 2012. Designing selection systems for medicine: The importance of balancing predictive and political validity in high-stakes selection contexts. *Int J Select Assess* 20(4):486–496.
- Patterson F, Zibarras L, Carr V, Irish B, Gregory S. 2011. Evaluating candidate reactions to selection practices using organisational justice theory. *Med Educ* 45(3):289–297.
- Patton M. 2002. *Qualitative research and evaluation methods*. 3rd ed. California: Sage Publications.
- Poole P, Shulruf B, Rudland J, Wilkinson T. 2012. Comparison of UMAT scores and GPA in prediction of performance in medical school: A national study. *Med Educ* 46(2):163–171.
- Pope C, Mays N. 2006. (editors) *Qualitative research in health care* BMJ books. Chapter 8. Oxford: Oxford Blackwell Publishing.
- Powis D. 1994. Selecting medical students. *Med Educ* 28(5):443–469.
- Powis D. 2010. Improving the selection of medical students. *Br Med J* 340: 432–433.
- Prideaux D, Roberts C, Eva K, Centro A, Mc Crorie P, McManus C, Patterson F, Powis D, Tekian A, Wilkinson D. 2011. Assessment for selection for the health care professions and specialty training: Consensus statement and recommendations from the Ottawa 2010 Conference. *Med Teach* 33(3):215–223.
- QSR International. 2012. NVivo qualitative data analysis software. QSR International Pty Ltd Version 10.
- Roberto K, Gigliotti C, Husser E. 2005. Older women's experiences with multiple health conditions: Daily challenges and care practices. *Health Care Women Int* 26:672–692.
- RTÉ. 2012. RTÉ News Dublin, Sept 2012. [Accessed 1 October 2013] Available from <http://www.rte.ie/news/2012/0921/338533-hpat-medicine/>.
- Rubin HJ, Rubin IS. 2004. *Qualitative interviewing: The art of hearing data*. 2nd ed. California: Sage.
- Smyth DH. 1946. Some principles in the selection of medical students. *Br Med J* 2(4471):357–367.
- Tippins NT, Seymour A. 2011. *Technology-enhanced assessment of talent*. Vol. 30. San Francisco, CA: Jossey-Bass, p 200.
- Wright SR, Bradley PM. 2010. Has the UK clinical aptitude test improved medical student selection? *Med Educ* 44(11):1069–1076.

Appendix 1: Topic guide

Topic 1: Exploration of general thoughts

Key questions: What are your thoughts having sat the HPAT-Ireland?

Topic 2: Establishment of pre-test expectations and any changes to these expectations

Key questions: What were your expectations of the HPAT-Ireland before sitting it?

Have your expectations changed having sat the HPAT-Ireland? If so talk to me about this

Topic 3: Resonance with clinical practice

Key questions: To what extent did the HPAT-Ireland tap in to skills that you use in your practice as a doctor? Can you expand on this?

Specific probes: Can you give me an example of a skill that you used in the HPAT-Ireland and where you would use that same skill in clinical practice?

Topic 4: Exploration of skills used in Section 1: "Logical Reasoning"

Key questions: What were your thoughts on this section?
What skills do you think you used to answer this section?
Specific probes: In what way, if at all, does this section correlate with your medical practice? (If not addressed already)

Topic 5: Exploration of skills used in Section 2: "Interpersonal Understanding"

Key questions: What were your thoughts on this section?
What skills do you think you used to answer this section?
Specific probes: In what way, if at all, does this section correlate with your medical practice? (If not addressed already)

Topic 6: Exploration of skills used in Section 3: ‘Abstract Reasoning’

Key questions: (1) What were your thoughts on this section?
(2) What skills do you think you used to answer this section?

Specific probes: In what way, if at all, does this section correlate with your medical practice? (If not addressed already)

Topic 7: Exploration of the meaning and interpretation of the HPAT-Ireland

Key questions: What do you think the HPAT-Ireland brings to medical student selection?

Can you tell me why you have this view?

What message do you think the HPAT-Ireland sends out to medical school applicants and their families?

What do you think, is the value of the HPAT-Ireland?

Specific probes: What are your thoughts on the usefulness of the HPAT-Ireland in predicting how well someone would perform as a doctor later on in life?

What are your thoughts on the usefulness of the HPAT-Ireland in predicting how well someone would perform as a medical student?

Would you suggest any changes to the HPAT-Ireland?

What are your thoughts on the influence the HPAT-Ireland might have on student diversity?

What are your thoughts on whether or not the HPAT-Ireland is specific to health professions?

Final questions: Is there anything else you would like to say about the HPAT-Ireland?

Is there anything I haven’t asked you that you feel I should have?

Appendix 2: Member checking: cover letter and doctor responses

Dear _____

Many thanks for participating in this study to date. The time that you gave to both sit the HPAT-Ireland and do the interview was most appreciated. The analysis of the data from

the post HPAT-Ireland one-to-one interviews proved very interesting. In order to ensure that I have captured and interpreted the views of the study participants accurately I am “member checking” with approximately half of the group. To this end I have summarised what I understood from your interview and include it here for your verification. I am also attaching the original verbatim transcript from your audio taped interview.

In my summarised account of your interview, the order of topics may vary slightly, for the purpose of clarity, from the way it is in the actual interview. I ask you to please look over your original interview and then read through my two page summary to see if I have captured the essence of what you said at the time of the interview.

You are not being asked to offer any additional views or to go through the original interview in great detail. What I would like you to comment on is whether or not I have correctly summarised the overall sense of the interview, and whether my summary is a true reflection of what you thought and felt at that interview. Please also know that I am happy to be corrected should you need to do so.

You will see that your original interview is transcribed verbatim, including any repetitions, hesitations and grammatical errors that are usual in everyday spoken English. It is common place for some Doctors to find this unsettling or even slightly embarrassing to read over. However please be assured that this is normal for unprepared conversation and a regular feature of qualitative data. In the final write-up I will take care when using quotes to select them, or where appropriate edit them, so that they will read easier. The utmost care will be taken to retain the exact meaning of the phrase.

Please respond to me by email at maureen.kelly@nuigalway.ie

Yours sincerely,
Dr. Maureen Kelly,
Lecturer,
GP Department,
Clinical Science Institute
NUI, Galway, Ireland