Ir Med J; June 2022; Vol 115; No. 6; P614

June 30th, 2022

Clinicians Engagement with Research: Motivating and Impeding Factors

J.C. Morrison[1], N.M. Allen[1], S.A. Lynch[2], T.P. McVeigh[3], M.J. O'Grady[4]

1. Department of Paediatrics, National University of Ireland Galway, & Galway University Hospital, Ireland.
2. Department of Clinical Genetics, Children's Health Ireland at Temple St., Dublin 1, Ireland and Children's Health Ireland at Crumlin, Dublin 12, Ireland.
3. Cancer Genetics Unit, The Royal Marsden NHS Foundation Trust, Chelsea, London, UK.
4. Regional Hospital Mullingar, Mullingar, Co. Westmeath, Ireland, & Women's and Children's Health, UCD School of Medicine, Belfield, Dublin 4, Ireland.

Abstract

Aims

The integration of research into medical practice has been instrumental in guiding the evidence-based advances associated with enhanced healthcare delivery. Elucidation of the factors influencing research engagement will guide research participation and improve patient care. The aim of this study was to explore factors affecting research engagement among clinicians* working in various health settings across Ireland.

Methods

A convenience sample of 400 Irish hospital-based clinicians* were surveyed online.

Results

Response rate was 50%. The majority ranked research 'essential'. Career progression was ranked the strongest motivating factor and performing research to improve patient benefit. Lack of protected research time was the strongest impeding factor. The majority did not rank 'hospital environment' as encouraging for research engagement. There were no apparent gender differences. Sixty-three percent had a relevant higher academic degree. Research as a student did not correlate with higher publication success, but MD/PhD degree did.

Conclusion

Clinician* engagement in research and academic attainment were high in this predominantly hospital-based cohort and correlated with grade and higher academic degrees. Career progression and improving patient health were significant motivating factors, but not the 'hospital environment'. Barriers include lack of protected time, and perceived lack of infrastructure.

Keywords*:* academic; clinical research; survey; translational

*****Clinician refers to medical doctor (surgical or physician) throughout. NCHD, non-consultant hospital doctor.

Introduction

The integration of research into medical practice has long been instrumental in guiding evidence-based advances associated with enhanced healthcare delivery. Clinical research embedded in the health service is associated with lower rates of hospital mortality and increased patient satisfaction[1, 2]. Establishing a research culture among healthcare workers is associated with enhanced organisational and staff efficiency[3], as well as recruitment and retention. However, human disease burden, and management thereof poses many complex challenges, and there remains a large gap translating scientific knowledge into healthcare delivery[4]. Despite these and other challenges in health research activity, the number of clinician-scientists in the workforce appears to have diminished. Surveys in other countries raise concern regarding infrastructures and resource provision for those interested in pursuing clinical research[5, 6].

There is limited data regarding clinician-reported influences of research activity in Ireland. A report published by the Health Service Executive (HSE) in 2019, highlighting heterogeneity in data capture measures, suggested an underperforming research infrastructure within the Irish health service compared to other EU countries[7]. In order to reach the goal of embedding clinical research in healthcare delivery, maximising health service and individual patient benefit, understanding the factors that influence clinicians' engagement with research in Ireland is of paramount importance. Obtaining information about clinician knowledge and attitudes towards research may offer insight and opportunity regarding the key provisions required to support early-stage clinicians, "non-academic" consultant clinicians as well as the crucial role of the clinician-scientist.

The aim of this study was to determine research participation, and to explore factors influencing research engagement among a cohort of Irish hospital-based clinicians.

Methods

A convenience sample of Irish clinicians were surveyed via SurveyMonkey® (CA, USA), published January 2018. Participants were hospital-based and selected via a mixture of sources including a medical Grand Rounds administration list (n=200), surgical conference list (n=150) and a sample of clinicians from the authors own contacts (n=50). Participants consisted of trainees (NCHDs) and consultants. The URL for the survey was embedded in an email sent to participants. Survey data was anonymously downloaded in Excel. The survey was closed after 6 weeks. GraphPad Prism 9 was used for statistical analysis. Differences between groups were analysed using the Chi square test for trend, Mann-Whitney U test and Fisher's exact. A p-value of <0.05 was considered statistically significant.

Results

General Characteristics

In total 50% (201/400) of participants responded, with a similar proportion of males and females, and slightly more senior NCHDs than consultants and junior NCHDs (Table 1). Of those who responded, 62% had international work experience, 63% had a relevant higher degree and 63% took part in research as a student. MDRes/PhD degree was more strongly associated with publication rates than Masters (Table 2). Student participation in research did not correlate with higher publication rate ($p > 0.05$; Chi^2 for trend; Table 2). Approximately 55% of respondents were familiar with H-index scores, while 17% knew their own H-index.

Table 1. Key Characteristics of Respondents.

Number of respondents	201
Male: Female	97 (48.3%): 104 (51.7%)
Title/Grade	
Intern/SHO (junior NCHD)	38 (18.9%)
Registrar/ SpR (senior NCHD)	84 (41.8%)
Consultant	68 (33.8%)
Other[#]	11 (5.5%)
Specialty	
Medicine	68 (33.8%)
Surgery	63 (31.3%)
Paediatrics	35 (17.4%)
Psychiatry	10 (5%)
Other[#]	25 (12.5%)

Qualifying university	
UCD	44 (21.9%)
RCSI	42 (20.9%)
NUIG	40 (19.9%)
TCD	31 (15.4%)
UCC	21 (10.4%)
Other	18 (9%)
UL	5 (2.5%)
Higher degree	62.7%
MDRes/PhD	72 (35.8%)
Masters	54 (26.9%)
Consultant	59/68 (86.7%)
Junior NCHD	10/35 (28.6%)
Senior NCHD	37/79 (46.8%)
Research participation as student	126 (63%)
H-index knowledge (yes)	111/201 (55.2%)
Know H-index	34 (16.9%)
Experience abroad	123/201 (61.5%)
[#]Other (Specialty/Grade): GP 3.5%, Ophthalmology 3%, Radiology 1.5%, Anaesthesia 1.5%, Obstetrics 1%, Public Health 0.5%, Histopathology 0.5%, Intern undecided 0.5%, Research Fellow 0.5%. **Abbreviations:** SHO, senior house officer; SpR, specialist registrar; UCD, University College Dublin; RCSI, Royal College of Surgeons Ireland; NUIG, National University of Ireland Galway; TCD, Trinity College Dublin; UCC, University College Cork; UL, University of Limerick	

Publication rates and group comparisons

Higher publication rates and higher academic degree attainment correlated with grade. Comparing male to females (consultants and NCHDs) there were no statistically significant differences in total, first and last author publication rates ($P>0.05$) controlling for grade due to significantly higher proportions of consultant males and senior NCHD females (Fischer's exact test, Table 2). There were no significant gender differences between those with a higher research degree.

Those with higher academic degree attainments (MDRes/PhD/Masters) had higher numbers of overall publications, and those with MD/PhD had higher publication rates compared to Master's group comparisons ($p <0.05$), except last author publications (Chi^2 test for trend $p= 0.1629$). In addition, direct entry graduates had a higher publication rate in comparison to those who completed a post-graduate medical degree (Table 2).

There were no significant differences in the rate of publications or academic degree attainment with a history of research participation as a student. There were no significant differences in publication rate between those who qualified in Ireland versus those who qualified abroad (Table 2). There were no significant differences in H-index numerical value for gender who knew their own H-index (p = 0.2871, Mann Whitney U).

Table 2. Publication Rates (n=201 respondents)

	Total	**Median**	**Mean**	**Range**	**Standard Deviation**	**Group Comparisons**	
						Chi^2 Test for Trend	**Fisher's Exact**
Gender							
Male (n=88)	2816	10	32	0-330	51.5	10.50	
Female (n=96)	1344	3	14	0-145	23.4	(p = 0.0012)	
Consultants (n=61)	3261	32	53	1-330	56.7	0.573	p = 0.0001
Male (n= 40)	2412	32.5	60	4-330	64.7	(p = 0.4491)	(Sig)
Female (n=21)	849	30	40	1-145	34.8		
Junior NCHDs (n=34)	92	1	3	0-21	4.4	1.258 (p = 0.2620) (Total NCHDs combined)	p = 0.1888 (NS)
Male (n=15)	46	2	3	0-15	4.0		
Female (n=19)	46	1	2	0-21	4.8		
Senior NCHDs (n=76)	587	4	8	0-62	12.3		p = 0.0064 (Sig)
Male (n=28)	271	4.5	10	0-50	12.8		
Female (n=48)	316	3	7	0-62	12.0		
MD/PhD (n=60)	2474	28.5	41	5-150	37.6	3.76	p = 0.2401
Male (n=31)	1546	32	50	6-150	41.4	(p = 0.0526)	(NS)
Female (n=29)	928	19	32	5-145	31.3		
Master's degree (n=37)	779	10	19	0-93	23.6	3.51	p = 0.4362
Male (n=17)	462	20	27	0-93	26.6	(p = 0.0610)	(NS)
Female (n=20)	317	4	13	0-63	18.8		
Graduate versus Direct Entry							
Post-graduate (n=34)	260	3	8	0-55	11.8	7.7	-
Undergraduate (n=150)	2873	6	19	0-330	43.6	(p = 0.0055)	
Where qualified							
Ireland (n=168)	3838	6	23	0-330	40.9	0.63	-
Abroad (n=16)	295	4	18	0-140	34.5	(p = 0.4263)	
MD/PhD degree (n=60)	2474	28.5	41	5-150	37.6	15.06	-
Master's degree (n=37)	779	10	19	0-93	23.6	(p = 0.0001)	
Participated in Student Research Activity							
Yes (n= 116)	1840	15	16	0-220	29.8	3.023	-
No (n=67)	1890	6	32	0-330	52.8	(p = 0.0821)	

Abbreviations: Non-Consultant Hospital Doctor (NCHD); Junior NCHD (Senior House Officer (SHO)/Intern); Senior NCHD (Registrar/ SpR); Male (M); Female (F); Significant (Sig); Not significant (NS); Versus or compared to (Vs).

Motivating and Impeding Factors

The majority of participants ranked clinician involvement in research as either 'essential' (22%; n=44), 'very important' (35%; n=70), or 'somewhat important' (33.5%; n= 67), while 9.5% (n=19) believed that research was non-essential/unnecessary. However, 66% of participants would still have an interest in completing research if career progression was not a factor, while 26% indicated that they would like to be involved but not take on their own research projects.

When asked to rank potential *motivating factors* for participating in research, 'career progression' was the strongest factor (Figure 1), though having a 'supportive supervisor', followed by 'topic interest' also ranked highly. The majority of participants did not rank 'hospital environment', 'awards' or 'research grants' as motivational. Opportunities to do research during summer break, followed by 'mandated by the college', were the factors that most influenced medical student research participation.

When asked to rank potential *impeding factors* to participation in research, 'lack of protected academic and research working hours' was the strongest factor (Figure 2). Lack of funding was also a strong impeding factor, followed by lack of support/supervision, family and alternative career commitments. The majority of participants (~91%) were involved in a project that did not make publication, and the most common theme was insufficient time. Clinical commitments or NCHD clinical rotation durations were competing factors. Additional factors ranked lower.

There were no obvious gender disparities with respect to motivating and impeding factors for carrying out research. There were no significant gender differences in the reasons for completion of research as a student.

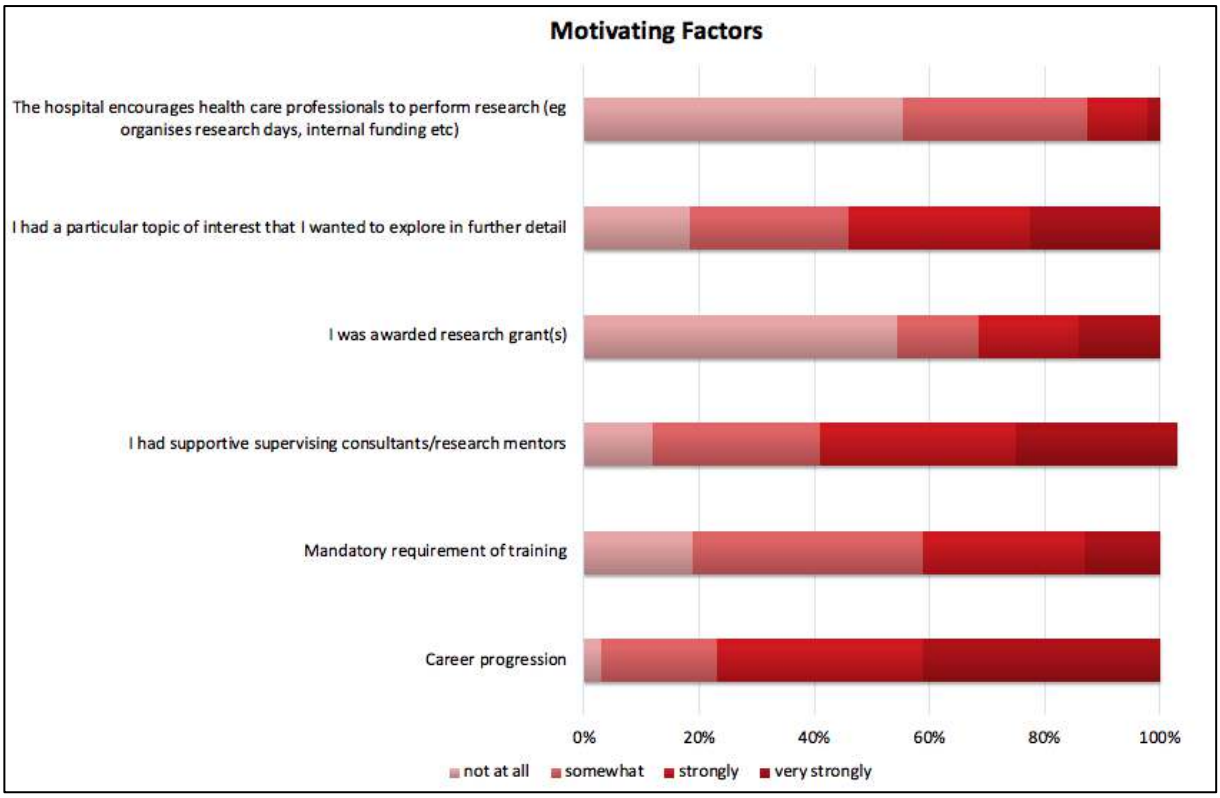

Figure 1. *Motivating factors for research participation.*

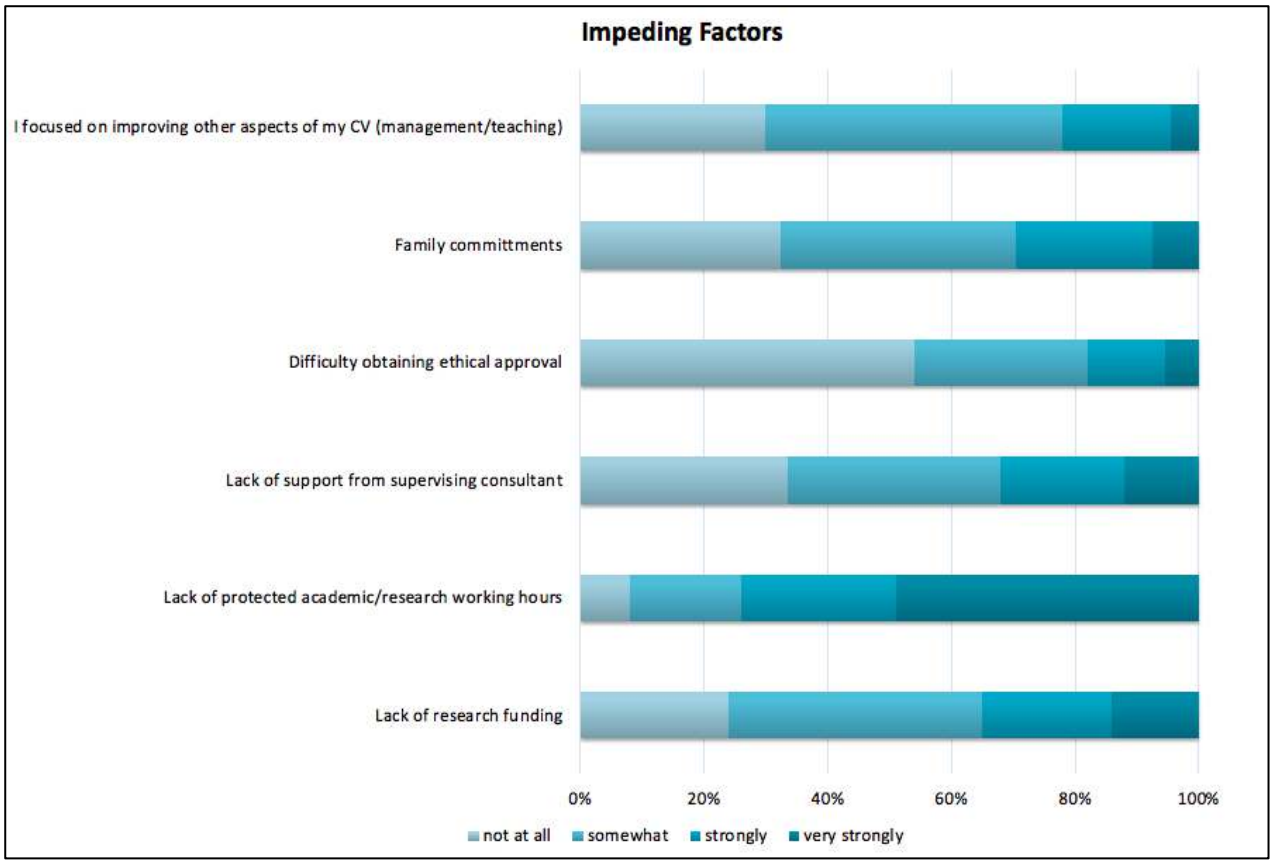

Figure 2. *Impeding factors for research participation.*

Fifty percent of participants who had worked or were currently working abroad found it easier to engage research, ranked highest among those who had worked in Canada (90%; n=9/10), North America (86%; n=25/29), Australia (70%; n= 21/30) and the U.K (67%; 33/49). Reasons considered most influential for completing research abroad included having more protected time and a proactive research community/drive within the workplace. Contract obligation to carry out research was considered a less important influential factor.

Discussion

This study identified a high level of research interest among a convenience sample of predominantly hospital-based Irish clinicians. Among the motivating factors elucidated, career progression and desire to use research to improve patient care was apparent (quantitatively and qualitatively determined). Opportunity to do research and more formal requirements may influence higher rates of research engagement, as observed across those members of the cohort who completed a higher research degree or carried out research abroad. Time limitation was highlighted as the highest rated impeding factor in this survey and the most common reason for unpublished work. Time was also shown to be a strong factor which apparently facilitates research during experience abroad. Lack of funding streams and improved infrastructures or supports were also identified.

Similar trends have been observed in other reports including a recent UK-based survey[8], where intellectual stimulation as well as desire to improve patient care were the most important drivers of research engagement, while inadequate protected time and lack of dedicated resources as probably the most important barriers to clinician engagement in research[9, 10].

Participants in this survey did not rank 'the hospital environment', as a motivational factor conducive to research engagement. A potential lack of meaningful research culture at local organisational level is of concern. While we did not distinguish *medical consultants with a formal academic appointment* whom are key drivers of research (representing 7% of the workforce and 37% of the national publication output), it is still noteworthy that over 60% of research output in Ireland, is performed by clinicians with no formal academic appointment[7]. A large volume of clinical research is clearly evident among those with no formal academic contractual obligations, despite the barriers identified here and elsewhere, reflected in the large proportion of research hours reported by doctors who are not formally employed in a research role[9, 10,8]. A recent report completed by the HSE suggests that health sector research appears to be underperforming in comparison to other countries[7]. While investment in local infrastructures and network development has recently occurred in Ireland, how this will translate at local organisational levels and influences a culture of research among clinicians across all settings, is yet to be determined.

In this study we observed that Research degree attainment and publication rate was typically hierarchical and stage-dependent. While many participants performed research as a student, this did not translate to later higher publication success. MDRes/PhD degree attainment (above Master's degree) correlated with publication rate. These observations may reflect a likelihood that research infrastructures with respect to student and junior NCHD training pathways in Ireland have not formally embedded sufficient research supports at these early stages, in comparison to those formal research pathways so far adopted MDRes/PhD programmes which enhance research engagement. Given the additional positive ranking of supervision in research, and competitive nature of training schemes, fostering and supporting of mentoring schemes, and formal specialist academic programmes in training, is of high importance for success in clinical research.

We found that the motivating and impeding factors examined in this survey revealed no major gender differences. Quantitatively we did not identify clear gender differences for academic attainments (publication rate and research degree) but a larger cohort is likely required to examine this further. In the UK, where the NIHR receives ~1% of NHS budget commitment, offering infrastructures and other supports to those who have no prior research experience and those coming back from hiatus/career breaks, gender distribution of clinical research activity remains skewed. Females tend to be less involved in research than males[9, 10], despite desire to be involved. While we did not clearly determine similar gender disparities however, the findings of impeding factors affecting both males and females may reflect a general lack of 'protected time' and training opportunities, lack of flexible training opportunities, or opportunity for engagement and re-engagement in research after epochs of time out.

Limitations of study include the survey of a convenience sample, and those who responded may suggest a more research-motivated cohort, or those more affiliated with academia. In addition, doctors who qualified overseas are under-represented (9% of respondents), although they make up a significant proportion of the hospital-based medical workforce. While a proportion of the survey contained open-ended questions identifying similar factors influencing research engagement, deep exploration of these complex factors underlying gender comparisons were not deeply examined. In the UK, females have similar motivations to males to be engaged in research[9, 10, 8]. Different professional cultures, genders and specialties exist within the complex clinical research arena encapsulating health care research. Further explorations of the factors identified influencing clinician engagement would help promote and implement the necessary organisational and infrastructural changes that will translate research into patient benefit.

Good quality research improves patient outcomes but requires financial support (research grants). The Department of Health encourages medical experts in Ireland to join the European Reference Networks - an EU initiative whose aim is to concentrate knowledge and resources[11] on complex or rare diseases and conditions that require highly specialised treatment. Each Irish centre for expertise needs to demonstrate a strong research culture by listing active research grants and recent publications, if they wish to be accredited within the EU as a centre of expertise. It is therefore important to recognise that achievement in securing international grants is dependent on the principal investigator having a proven track record in international publication. Studies have shown that the Republic of Ireland lags behind other Western European countries in drawing funds for Rare Disease medical research[12] and as such any over-reliance on international research will not optimally improve Irish patient care. Ireland has island and population health research advantages, and specific cohorts of interest (e.g. unique rare diseases). It is thus essential, both for the health of Irish and international patients, that we enhance our approaches. Protected time, infrastructures and other practical supports for mentoring and training of medical students, NCHDs and those who want to pursue research careers at later stages, are essential in order to embed a clinical research culture in hospitals, improve successes of medical science and ultimately patient outcomes.

Acknowledgements:
Prof Andrew Smith, Clinical Research Facility, NUI Galway.

Declaration of Conflicts of Interest:
There was no conflict of interest in writing this manuscript. Authors had no affiliations with any organisation or financial interest in the subject matter discussed.

Corresponding Author:
Julia C. Morrison
Department of Paediatrics,
National University of Ireland Galway,
& Galway University Hospital, Ireland.
E-Mail: morrisj8@tcd.ie

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