Do National Licensing Examination Scores Predict Patient Complaints as well as Physician Opioid and Benzodiazepine Prescribing Patterns?

André De Champlain, Sirius Qin, Fang Tian of the Medical Council of Canada
adechamplain@mcc.ca, 1-613-521-6012 ext.2541

Nigel Ashworth, Nicole Kain, Delaney Wiebe of the College of Physicians and Surgeons of Alberta

Background

The Medical Council of Canada Qualifying Examination (MCCQE) Part I and Part II are one of the prerequisites for licensure for independent practice in Canada.

Primary use of these exams is to assess whether a candidate has demonstrated an adequate level of competency in the domains necessary for entry into independent practice.

Growing interest in gathering evidence to assess whether medical licensing exams can be used to support secondary validity inferences.

Prior research suggests that MCCQE scores can be significant predictors of quality of medical care, including patient complaints and prescribing behaviours. *(Tamblyn et al., 2007; Wenghofer et al., 2009)*

Purpose of Study

To gather secondary evidence of validity for the MCCQE Part I and Part II by assessing whether they can predict:

- Patient complaint rates for a sample of practising physicians in Alberta, Canada
- Inappropriate benzodiazepine and opioid prescribing behaviours for this sample

Sample:

3,404 physicians registered with CPSA within the past 15 years who completed the MCCQE between 1992 and 2017

Variable	N	Group	Per cent
Gender	3,402	Females	1,458 (42.9%)
		Males	1,944 (57.1%)
CMG/IMG	3,404	CMGs	2,069 (60.8%)
		IMGs	1,335 (39.2%)
Specialty certification	3,404	Family medicine/GP	1,662 (48.8%)
		Primary specialty	747 (21.9%)
		Other specialty	995 (29.2%)

		Mean	SD	Min	Max
Age	3,404	43.3	7.6	30	80
Years since registration	3,404	11.7	4.0	4.8	27.4

Predictors:

1. **First attempt pass/fail (P/F) status MCCQE Part I:** Assesses critical medical knowledge and clinical decision-making skills at a level expected of a physician entering supervised practice (residency) in Canada.
2. **First attempt P/F status MCCQE Part II:** Objective structured clinical examination (OSCE) which assesses clinical skills at a level expected of a physician entering independent practice in Canada.
3. **CPSA** houses various datasets from which additional practice and socio-demographic variables for these analyses were sourced.

Outcomes & Analyses:

4 Outcomes:
- Total number of patient complaints
- Total number of patients for whom 90+ OME opioids prescribed
- Total number of patients for whom (=3xDDD) benzo prescribed
- Total number of patients for whom 2+ opioids and 2+ benzos prescribed

OME = *Oral morphine equivalents for opioid utilization*

3xDDD = *Three times the defined daily dose of benzodiazepines*

Analyses:
- Quasi-Poisson regression models separately run for each of the four outcomes

MCCQE Part I and Part II:

Caveat:
- MCCQE Part I and Part II scores were historically on different scales and not fully equated until 2013 (i.e., not completely comparable over time)
- Predictors restricted to MCCQE Part I and Part II first attempt P/F status for our study

Sample P/F Rates:

Exam	N	Group	Per cent *
MCCQE Part I (first attempt)	3,283	Fail	401 (12.2%)
		Pass	2,882 (87.8%)
MCCQE Part II (first attempt)	2,909	Fail	495 (17.0%)
		Pass	2,414 (83.0%)

Actual counts (3,283 and 2,909) do not match the original sample size of 3,404 since not every physician completed the MCCQE Part I or Part II.

For ex., 121 physicians (3,404 -3,283) did not complete the MCCQE Part I but did complete other MCC exams; hence they were included in the initial data set.

Results

Predicting the Total Number of Complaints

Predictor	$\hat{\beta}$	IRR	Type I error*
Years since registration	0.07	1.07	< 0.001
Discipline flag – FM/GP	0.78	2.17	< 0.001
Days/week of providing medical services?	0.23	1.26	< 0.001
Canadian medical graduate	-0.59	0.56	< 0.001
Not accepting new patients for office practice in Alberta	-0.40	0.67	< 0.001
Females	-0.40	0.67	< 0.001
Age	0.02	1.02	< 0.001
Does not perform procedures which require sedation/LA/GA	-0.32	0.73	< 0.001
MCCQE Part I first attempt Fail standing	**0.24**	**1.27**	**< 0.001**
Does not use an EMR system	-0.27	0.77	0.001
Does not have privileges in any capacity	0.20	1.22	0.001
Does not practise exclusively as a locum	0.51	1.66	0.003
Teaching with no provision of medical services	0.01	1.01	0.009
Discipline flag – Other primary specialty	-0.23	0.79	0.019
Does not share patient information with other physicians	0.14	1.15	0.033

Predicting 2+ Opioids & 2+ Benzodiazepines

Predictor	$\hat{\beta}$	IRR	Type I error*
Days/week of providing medical services	0.39	1.48	< 0.001
Discipline flag – FM/GP	4.37	79.32	< 0.001
Females	-0.40	0.67	< 0.001
Does not perform procedures which require sedation/LA/GA	0.85	2.34	< 0.001
Canadian medical graduate	-0.37	0.69	< 0.001
Not accepting new patients for office practice in Alberta?	-0.30	0.74	< 0.001
Age	-0.02	0.98	< 0.001
Does not practise exclusively as a locum	2.63	13.94	< 0.001
Teaching with no provision of medical services	-0.06	0.95	0.001
Does not use an EMR system	-0.47	0.63	0.001
MCCQE Part II first attempt Fail standing	**0.26**	**1.30**	**0.002**

IRR = *Incidence rate ratio.*

*** =** *All effects were statistically significant at a Holm-Bonferroni adjusted Type I error rate of 0.05.*

Conclusions

- Candidates who failed the MCCQE Part I on their first attempt, on average, received 27% more complaints than passing candidates
- Candidates who failed the MCCQE Part II on their first attempt, on average, prescribed 2+ opioids and 2+ benzodiazepines to 30% more patients than passing candidates
- Other CPSA variables were also useful predictors of patient complaints and prescribing behaviour, including:
  - Receiving a discipline flag (complaints and prescribing behaviour)
  - Training (international medical graduates) (complaints and prescribing behaviour)
  - Using an EMR system (complaints and prescribing behaviour)
- Provides useful preliminary information that might aid in identifying risk and supportive factors for physicians in need