

Differences in the Assessed Performance of Medical Interns in a Comparison of Competency-based and Subject-based Curricula: a Qualitative Study

Titi Savitri Prihatiningsih (✉ titi.savitri@ugm.ac.id)

Universitas Gadjah Mada

Prattama Santoso Utomo

Universitas Gadjah Mada

Hikmawati Nurrokhmani

Universitas Gadjah Mada

Mora Claramita

Universitas Gadjah Mada

Albert Scherbier

Maastricht University

Research Article

Keywords: internship, competence-based curriculum, subject-based curriculum, medical school, professional training

Posted Date: April 26th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-439288/v1>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

1 **Differences in the assessed performance of medical interns in a**
2 **comparison of competency-based and subject-based curricula: A**
3 **qualitative study**

4

5 **Titi Savitri Prihatiningsih¹, Prattama Santoso Utomo¹, Hikmawati Nurrokhmanti¹, Mora**
6 **Claramita¹, Albert Scherpquier²**

7 ¹Department of Medical Education and Bioethics, Faculty of Medicine, Public Health and Nursing,
8 Universitas Gadjah Mada, Yogyakarta, Indonesia

9 ²School of Health Professional Education, Maastricht University, The Netherlands

10

11

12 **List and Affiliation Details of Authors (based on the order of appearance):**

13

14 **Assoc. Prof. Titi Savitri Prihatiningsih, MD, MA, MMedEd, PhD (Corresponding Author)**

15 Department of Medical Education and Bioethics, Faculty of Medicine, Public Health and Nursing,
16 Universitas Gadjah Mada. Radiopoetro Building 6th Floor, Farmako Street, Sekip, Yogyakarta,
17 Indonesia. Phone: +62-274-562139. Email: titi.savitri@ugm.ac.id

18

19 **Asst. Prof. Prattama Santoso Utomo, MD, MHPed**

20 Department of Medical Education and Bioethics, Faculty of Medicine, Public Health and Nursing,
21 Universitas Gadjah Mada. Radiopoetro Building 6th Floor, Farmako Street, Sekip, Yogyakarta,
22 Indonesia. Phone: +62-274-562139. Email: prattama.santoso.utomo@ugm.ac.id

23

24 **Asst. Prof. Hikmawati Nurrokhmanti, MD, MSc**

25 Department of Medical Education and Bioethics, Faculty of Medicine, Public Health and Nursing,
26 Universitas Gadjah Mada. Radiopoetro Building 6th Floor, Farmako Street, Sekip, Yogyakarta,
27 Indonesia. Phone: +62-274-562139. Email: drhikma@gmail.com

28

29 **Prof. Mora Claramita, MD, MHPE, PhD**

30 Department of Medical Education and Bioethics, Faculty of Medicine, Public Health and Nursing,
31 Universitas Gadjah Mada. Radiopoetro Building 6th Floor, Farmako Street, Sekip, Yogyakarta,
32 Indonesia. Phone: +62-274-562139. Email: mora.claramita@ugm.ac.id

33

34 **Prof. Albert Scherpquier, MD, PhD**

35 School for Health Professions Education, Faculty of Health, Medicine and Life Sciences
36 Maastricht University, Universiteitssingel 60, 6229 ER Maastricht
37 P.O. Box 616, 6200 MD Maastricht, The Netherlands. Phone: +31 43 388 5798 . Email:
38 a.scherpbier@maastrichtuniversity.nl

39

40

41 **ABSTRACT**

42 **Background:** An internship is a transitional training period a medical school graduate
43 undertakes prior to attaining full registration as a medical doctor. Numerous studies have
44 shone a light on the unpreparedness of medical school graduates for the realities of medical
45 practice. Implementation of a competency-based curriculum (CBC) is thought to produce
46 better prepared medical graduates because this curriculum is more structured and integrated;
47 moreover, learning outcomes, the learning process, and assessment are better aligned in the
48 cognitive, affective, and psychomotor domains. During 2006–2011, Indonesia conducted a
49 nation-wide reform shifting to a CBC from a subject-based curriculum (SBC) and launched an
50 internship program in 2013. This study aimed to compare the performances of medical interns
51 training under these two different curricula.

52 **Methods:** This study was conducted in Yogyakarta Province, involving six supervisors and
53 six interns from six different types of district hospitals. Qualitative, semi-structured interview
54 methods, and thematic analysis were applied.

55 **Results:** In total, 1,296 initial codings were identified and grouped under the following topics:
56 overall experience (327), effective communication (97), scientific foundation (47), clinical skills
57 (48), information management (23), management of health problems (194), self-insight and
58 professional development (351), and professionalism (209). Eighteen themes emerged, namely
59 understanding the internship, authority, practice context, interprofessional communication,
60 patient communication, cultural awareness in communication, gap and fulfillment in clinical
61 skills, knowledge gap and enhanced knowledge, assumption of a General Practitioner role,
62 progression to proficiency, information literacy, internal motivation, learning opportunities,
63 constructive feedback, transition, and working culture. There were irregular patterns of
64 performance from both of the CBC and SBC interns. Interestingly, compared with the SBC

65 group, the CBC group revealed less confidence and assertiveness in handling patients. This
66 group also lacked communication skills when interacting with nurses and patients alike.
67 Moreover, the SBC group demonstrated the ability to learn and adapt quickly to the working
68 environment. Neither group paid much attention to information literacy.

69 **Conclusion:** We cannot conclude that a CBC would yield better prepared medical graduates.
70 The results of this study showed irregular patterns in eight areas. Hospital contexts and
71 variation in the characters of interns might have contributed to this irregularity. More
72 exposure to the working context and greater contributions from the healthcare system are
73 recommended in the medical curriculum, whether it be a CBC or a SBC. WC:338

74 **Keywords:** internship, competence-based curriculum, subject-based curriculum, medical
75 school, professional training

76
77
78

79 **BACKGROUND**

80 In many countries, especially those following the United Kingdom (UK) system,
81 internships are part of the training program medical students must undertake before they can
82 apply for registration as medical doctors. An internship is defined as the period of work-based
83 learning or practical training that follows medical school (1). In these countries, the internship
84 is perceived as the transition period from medical student to junior doctor. It can be
85 considered as formal or informal training, or part of postgraduate training, and is a critical
86 stage in the progression of a doctor's career (2). This transition is discerned as a major
87 challenge, particularly in terms of the increased responsibility and workload, as well as
88 increased professional contact with other healthcare workers and patients (3).

89 In this period, new medical graduates are confronted with the realities of the clinical
90 workplace, which require them to evolve from supervised interns to independent
91 practitioners. A number of studies have been conducted investigating this evolutionary
92 process from various perspectives. A study in Germany showed that many junior doctors
93 were not adequately prepared for their upcoming careers (4). This finding was confirmed by
94 research from various countries, indicating that this transition is frequently considered
95 stressful. In addition to the unpreparedness, poor support, and limited education, a number
96 of factors contributing to this stressful experience have been identified in new medical
97 graduates entering clinical practice (5). A study in the UK reported a higher prevalence of
98 burnout syndrome during the second semester of the internship. Students who conducted
99 their internships in public hospitals demonstrated higher scores on emotional fatigue and
100 depersonalization than those who performed their internships in private hospitals (6).
101 Another study drew the conclusion that the transition from medical student to clinician does
102 not necessarily have to be signaled by stress and mental fatigue but may provide a fruitful

103 opportunity for interns to grow into their roles as medical doctors if they are provided with
104 extensive support and guidance (7).

105 To overcome the unpreparedness of medical graduates, many medical schools have
106 reformed their curricula into competency-based or outcome-based curricula (8). The
107 University of New South Wales (UNSW) in Australia evaluated its medical graduates three
108 months into their internships. Medical graduates from a new outcome-based integrated
109 program rated themselves as having good clinical and procedural skills, with ratings that
110 indicated significantly greater capabilities than those of graduates of the previous UNSW
111 content-based program (9). Another study demonstrated the strength of an outcome-based
112 curriculum in its ability to produce competent students that are well prepared for their
113 internships (10). Other investigations into preparedness in terms of clinical skills showed no
114 significant differences between lecture-based and problem-based curricula in these metrics
115 (11,12). Problem-based graduates rated themselves as better prepared in their “awareness of
116 legal and ethical issues,” and lecture-based graduates rated themselves as better prepared in
117 their “understanding of disease processes” (12). A study in Groningen Medical School in the
118 Netherlands on the effect of implementing undergraduate competency-based medical
119 education did not support the assumption that competency-based education results in
120 medical graduates who are better prepared for medical practice (13).

121 In 2013, the Indonesian government launched an internship program for new medical
122 graduates, which was decreed in the Medical Education Law, following the implementation
123 of competency-based medical education enacted by the Indonesian Medical Council in 2006.
124 Between 2006 and 2011, Indonesia initiated a nation-wide reform of the medical curriculum,
125 while all medical schools were shifting from a subject-based curriculum (SBC) to a
126 competency-based (CBC) curriculum. This was conducted under the assumption that the

127 medical internship would produce better prepared medical graduates, who eventually would
128 become proficient independent practitioners. This study aimed to determine the differences
129 in medical interns' performance based on their curricular background, namely CBC and SBC.

130

131 **METHODS**

132 **1. Context**

133 This study was conducted in Yogyakarta Special Province, because it was among the first of
134 the Indonesian provinces to adopt the medical internship program. At the provincial level,
135 the Health Office of the Yogyakarta Provincial Government organizes the program, which
136 consists of recruitments, placements to district hospitals and community health centers, as
137 well as an induction program for the medical interns. Most of the medical graduates who
138 apply in Yogyakarta Province come from the three medical schools located in Yogyakarta. In
139 line with the enactment of the Standards of Medical Doctors' Competencies in 2006, the
140 Faculty of Medicine Universitas Gadjah Mada in Yogyakarta was the first in Indonesia to
141 implement CBC on a full scale in 2007. At the time of the study, there were interns who had
142 already graduated from the CBC in 2014–2015.

143 **2. Study Design**

144 This was a qualitative study using semi-structured interviews aimed at evaluating the
145 performance of medical interns in seven areas of competency as described in the Standards of
146 Medical Doctors' Competencies in 2006, namely effective communication, clinical skills,
147 scientific foundation of medicine, management of health problems, information technology,
148 self-insight and personal development, and professionalism. The phenomenon under

149 investigation is the performance of interns as it reflects their transition from competency to
150 proficiency during the internship program as perceived by the supervisors and their interns.

151 **3. Study Participants**

152 To achieve maximum sampling variation, participants were recruited from six different types
153 of hospitals: three public district hospitals from three different districts, one district military
154 hospital, one district police hospital, and one private hospital. Six medical interns from the
155 Faculty of Medicine Universitas Gadjah Mada were recruited, from both CBC and non-CBC.
156 Six supervisors who supervised these medical interns were recruited from the six hospitals.
157 In total, there were 12 interviewees, three medical interns from batches 2007 and 2008 who
158 experienced CBC and three medical interns from batches 2005 and 2006 who experienced the
159 old SBC, and six intern supervisors who supervised the interns. Recruiting the interns and
160 their supervisors who worked together in the same hospital could increase the study's validity
161 through data triangulation, since both sources of responses referred to the same hospital
162 context.

163 **4. Data Analysis**

164 Thematic analysis was applied in this research because it is especially suitable for
165 systematically identifying, organizing and suggesting insights into patterns of meaning
166 (themes) across a data set, which allows researchers to make sense of the collective meaning
167 and experiences. The purpose is to identify relevant themes to answer particular research
168 questions, which can be performed both inductively and deductively. A six-step approach to
169 thematic analysis was applied, namely (i) familiarization with the data, (ii) generation of
170 initial codes, (iii) search for themes, (iv) review of potential themes, (v) definition and naming
171 of themes, and (6) production of a report (14).

172 For the in-depth interviews, once completed, the responses were immediately
173 transcribed by the transcriber. The interviewer, who was part of the research team, would
174 check and identify the initial coding and themes. To strengthen the results' trustworthiness
175 and consistency, member-checking was applied. Three persons (namely, the interviewer, the
176 principal researcher, and the expert who was not member of the research team) conducted the
177 initial codings. Each person conducted the initial codings independently. Then, the principal
178 investigator thoroughly read the results of the initial codings and sorted them in accordance
179 with the interview questions using color codes. The initial codings with the same color codes
180 were assembled into a table to list the relevant topics. After reading the initial codings several
181 times and attempting to identify the underlying meanings, the principal investigator
182 constructed potential themes for each question from the CBC and SBC groups' responses.

183

184 **RESULTS**

185 There were 233 pages of transcripts from six supervisors and six medical interns, and
186 658 initial codings from supervisors and 734 initial codings from medical interns were
187 identified. The initial codings were grouped according to the interview topics. Table 1 shows
188 the sums of the initial codings for each of the topics from supervisors and medical interns
189 grouped into CBC and SBC. Potential themes were identified on the basis of initial codings
190 for each interview topic for supervisors and medical interns. After being reviewed and
191 contextualized in several iterations, potential themes with similar meanings or referring to the
192 same situations were further combined into a final theme, as demonstrated in Table 1.

193 Table 1. Number of initial codings for each interview topic from supervisors and medical interns

Interview topics	Initial codings from Supervisors	Initial codings for Medical Interns
------------------	----------------------------------	-------------------------------------

	CBC	SBC	CBC	SBC
Overall experience	64	30	85	148
Effective communication	42	19	23	13
Clinical skills	10	8	4	26
Scientific foundation	13	7	2	25
Management of health problems	71	21	64	38
Information management skill	-	9	3	11
Self-insight and personal development	77	74	88	112
Professionalism	96	33	34	46
Total	373	201	303	419

194 CBC: competency-based curriculum; SBC: subject-based curriculum

195 According to the above table, supervisors in the CBC group gave more explanations
 196 than those in the SBC group and provided more enlightenment on professionalism, whereas
 197 medical interns from the SBC group gave more descriptions than those in the CBC group and
 198 preferred to talk more about their experiences as interns and their personal development.

199 Based on all initial codings identified from the supervisors and interns (total number
 200 of responses = 1,296), 18 themes from all topics were developed, as depicted in Table 2.

201 Table 2. Themes that emerged for each interview topic

Interview topics	Themes
Overall experience	Understanding the internship
	Authority
	Practice context
Effective communication	Interprofessional communication
	Patient communication
	Cultural awareness in communication
Clinical skills	Gap
	Fulfillment
Scientific foundation	Knowledge gap
	Enhanced knowledge
Management of health problems	Assume a GP role

	Progress to proficiency
Information management skill	Literacy
Self-insight and personal development	Internal motivation
	Learning opportunities
	Constructive feedback
Professionalism	Transition
	Working culture

202 GP, general practitioner

203

204 Overall Experience

205 With regards to the overall experience, medical interns spoke more than supervisors. Medical
 206 interns from SBC expressed their overall experience more often than those from CBC. Three
 207 themes emerged from this topic: understanding the internship, authority, and practice
 208 context. The CBC group perceived the internship as a period for new medical graduates to
 209 become proficient and independent, whereas the SBC group considered the internship as an
 210 opportunity to apply medical knowledge and skills directly to patients, but under
 211 supervision. Concerning authority, the CBC group shared that medical interns were given full
 212 authority to practice as General Practitioners (GPs). However, the SBC group judged that,
 213 although interns already had medical degrees, they only had three-quarters of the
 214 responsibility, and the rest was held by the supervisors. For the practice context, the CBC
 215 group considered the total number of patients in a hospital important: If there is a small
 216 number of patients, then that hospital cannot be used for the internship program. The SBC
 217 group observed that, in practice, basic clinical procedures were conducted mostly by nurses,
 218 and every doctor had the authority to prescribe medication. Interns only had to adhere to the
 219 protocols. According to the response patterns, the SBC group perceived the internship as a
 220 continuation of the clinical rotation with additional responsibilities, whereas the CBC group
 221 understood the internship as a workplace where interns worked as GPs with full

222 responsibility. Table 3 shows some of the excerpts concerning the interns' overall experience
223 with the topic's three related themes.

224 Table 3. Excerpts for overall experiences

Competency-based curriculum	Subject-based curriculum
Understanding internship	
RP1 page 1 paragraph 2 <i>So, the purpose of internship is to prepare for the working as a GP later. It is expected, the interns become more proficient and independent.</i>	RI4 page 2 paragraph 12 <i>...it is the first time I applied my knowledge and skill from medical education. We could apply directly to the patient, but under supervision.</i>
Authority	
RP1 page 1 paragraph 2 <i>....interns are given freedom to perform clinical procedures in line with the GP competences.</i>	RI3 page 4 paragraph 22 <i>...the interns' responsibility around ¾...the other ¼ when we consulted...</i>
Practice context	
RI5 Page 16 paragraph 60 <i>...there are hospitals with small number of cases; in fact, they could not be used for internship.</i>	RP4 page 12 paragraph 44 <i>...in this hospital, basic clinical procedures are done by the nurses...</i>

225

226 **Effective Communication**

227 Three other themes emerged under effective communication, namely interprofessional
228 communication, patient communication, and cultural awareness in communication. With
229 regards to interprofessional communication, both groups responded that there were
230 communication problems between interns and with respect to certain characteristics of
231 nurses. The interns concluded that, in the end, what matters most in practice is
232 interprofessional communication, because they will always be working with other
233 professions.

The CBC group opined that patient communication needed improvement, especially in terms of how to show patients respect. CBC supervisors reported how CBC medical interns sometimes blamed patients or showed less empathy. CBC interns argued that they felt some lack of empathy with patients because, during their medical education, they practiced communication with probandus or simulated patients, whereas during their internship, they were realistically encountering dying patients and family members who had lost their loved ones, who were very emotional. They admitted that they were confused about how to respond to these situations. CBC supervisors explained that they had already tried to role model how to be more engaging with patients, such as hugging patients or touching or holding their hands. SBC supervisors expressed that SBC interns' engagement with patients was sufficient. There were no complaints from patients about medical interns. Medical interns admitted that they learned quickly how to communicate with patients during the internship, despite having only practiced with simulated patients in medical school.

247 For cultural awareness, CBC interns explained that practicing with simulated patients
248 was not sufficient to understand the diversity of the patients' cultural backgrounds, whereas
249 when the SBC interns were faced with cultural issues, they tended to be quiet at the beginning
250 while observing the behavior of other health professions and the house doctors. Gradually,
251 they adopted those behaviors. The following excerpts (Table 4) reflect these accounts.

Table 4. Excerpts for effective communication

Competence-based curriculum	Subject-based curriculum
Interprofessional communication	
RP2 page 7 paragraph 40	RP4 page 9 paragraph 29-32
<i>....misunderstanding with the nurses...</i>	<i>...there are complaints regarding communication between house doctors and internship, nurses and internship....</i>
RP2 page 25 paragraph 196	

...most important in the wards is communication with nurse and specialists.

Patient communication

RP3 page 21 paragraph 106

...interns need to improve their communication, especially how to respect patients...

R15 page 4 paragraph 10

...for example...when a patient was in severe abdominal pain...the intern would comment: 'of course, you had an abdominal pain, it was very painful'...In my opinion, this was not an empathic comment from a medical doctor.

RP5 page 7 paragraph 28

When I practiced communication with simulated patients, we knew that this was a simulation, so we could not bring out our emotion and empathy. But, when we were interns, we were exposed directly with a coma patient due to accidents. The family cried, all sorts of emotions appeared. This situation could not be found in the simulated situation.

RP6 page 3 paragraph 14

...interns' communication with patients are good...

RP5 page 7 paragraph 36

...no complaints about the interns' communication, there were no problems regarding this.

RI4 page 6 paragraph 26

Our communication skill improved significantly. We could communicate directly with patients, with medical colleagues. We had good communication with them.

RI5 page 4 paragraph 14

I observed the medical staff and the nurses here are not ready to handle patients' complaints, especially in the wards. They tended to blame the patients or showed less empathy. For example, a patient complaining of abdominal pain. The nurse just said--of course you are a sick person, you must experience pain.

Cultural awareness in communication

R15 page 9 paragraph 31–32

When we practiced communication skills with simulated patients, it was difficult to make it real, patients with various cultural background.

RP4 page 8 paragraph 28

...at first, the interns chose to be silent and observed...as the passage of time they became more confident to deal with culturally difficult patients

253

254 **Clinical Skills**

255 Regarding clinical skills, two themes were identified, namely the clinical skills gap and
256 fulfillment. For the first, both CBC supervisors and interns admitted that medical graduates
257 needed to practice their clinical skills more because, in medical schools, they were at the point
258 of "only having practiced the required clinical skills once." The CBC interns admitted that in

259 medical schools, they lacked the opportunities to apply their clinical skills directly to patients.
260 A SBC medical intern expressed that the stitching procedures used in the hospital were not
261 compliant with the standard procedures.

262 The second theme was fulfillment, indicating how medical interns could close this gap.
263 The CBC group explained that medical interns were given the authority to handle patients on
264 their own from the beginning, including anamnesis, physical examinations, and suggesting
265 supporting examinations. The SBC supervisors explained that some medical interns at first
266 were not able to perform wound stitching nor write medical prescriptions, but during the
267 internship, the supervisors taught them, and eventually they could perform both functions.
268 The SBC interns also mentioned that, because they were already a medical doctor, they were
269 more respected by other health professionals and house doctors, and thus they felt that they
270 had more freedom to apply their competencies to patients. This sentiment is echoed in the
271 following excerpts in Table 5.

272 Table 5. Excerpt for clinical skills

Competence-based curriculum	Subject-based curriculum
Clinical skills gap	
RI2 page13 paragraph 159 <i>During medical education, we learnt basic clinical skills in the skills lab, but we rarely used them afterwards.</i>	RI6 page 5 paragraph 16 <i>I found in the reality, not all medical procedures are complied with. Such as in suturing, sterilization is not done properly. This was different when we practiced in the skills lab.</i>
RI2 page13 paragraph 398 <i>I think, we lacked the repeated practices for clinical skills.</i>	
Fulfillment	
RI2 page 15 paragraph 190 <i>Internship give me chances to handle the patients directly, from anamneses, physical examinations, laboratory and other supporting examinations. This helps me to integrate the clinical skills and become more proficient.</i>	RI3 page 16 paragraph 71 <i>In internship, we are respected as a full medical doctor, therefore we have more discretions. When we did our clinical rotation, we were considered as disturbances in the health care...because we had no clear roles and responsibilities.</i>

273

274 **Scientific Foundation**

275 Knowledge gap and enhanced knowledge were two themes identified within this topic. This
276 knowledge gap shows that the CBC interns lacked knowledge of social health insurance. A
277 CBC supervisor confirmed that, since the social health insurance program was enacted to
278 provide universal coverage for the whole population in Indonesia, knowledge and
279 understanding of its claim procedures have been very important because this is what many
280 patients are most concerned about nowadays. For the SBC group, during their internship, this
281 social health insurance program had not yet existed. What concerned the SBC group was
282 knowing and understanding patients' condition holistically, not just their presenting signs
283 and symptoms. The CBC group explained they had detailed clinical knowledge, but this did
284 not automatically support them in dealing with patients.

285 For the enhanced knowledge, exposure to a variety of cases during the internship,
286 including dealing with medicolegal aspects, improved their medical knowledge. The SBC
287 interns revealed that only the clinical knowledge was useful. Biomedical knowledge—
288 especially biomolecular knowledge—was not needed that much, and only the
289 pathophysiology helped in dealing with patients. The following excerpts (Table 6) illustrate
290 this topic and its two related themes.

291 Table 6. Excerpts for scientific foundation

Competence-based curriculum	Subject-based curriculum
Knowledge gap	
RI2 page 36 paragraph 5–6 <i>...with social insurance for health, the procedures are complicated, we need to know what conditions are covered and not...whether this is an emergency or not....</i>	RP5 page 12 paragraph 73 <i>...interns need to recognize the patients and understand their condition.</i>
RP2 page 22 paragraph 164	RP5 page 13 paragraph 74 <i>The interns should know and understand patients' conditions, but they just copy paste the logbook.</i>

...when we asked the interns about particular diseases, they could answer. But when they applied to patients, it was not good...

Enhanced knowledge	
RP1 page 3 paragraph 18	RI4 page 12 paragraph 54
<i>...there are surgical, non-surgical, child, adult, geriatry, mental health, medicolegal...the interns handle a variety of cases.</i>	<i>....during internship, clinical sciences are most used and strengthened, then pathophysiology to understand disease mechanism; but biomolecular is not relevant.</i>

292

293 **Management of Health Problems**

294 For management of health problems, two themes were also identified. The first was "to
295 assume a GP's role." Both supervisors from CBC and SBC explained that the medical interns
296 were given the responsibilities to assume a GP's role. They examined the patients from the
297 beginning and wrote down all the findings in their medical records, including the treatment
298 given. The interns had discretion to determine when they needed to consult with the
299 specialists. Interns from both groups confirmed this and added that they also had a
300 responsibility to deliver promotions during placement in community health centers. The
301 second theme was "progression toward proficiency." Interns from both groups confirmed
302 that the internship improved them with proficiency in patient management. Although, there
303 were some obstacles, such as new protocols in district hospitals, and basic medical
304 procedures, such as suturing, which are the tasks of the nurses as illustrated in the following
305 excerpts in Table 7.

306 Table 7. Excerpts for management of health problems

Competence-based curriculum	Subject-based curriculum
Assume a GP role	
RP2 page 7 paragraph 40	R13 page 16 paragraph 70

...in the ward, interns must recognize emergency cases, when they could handle on their own and when to consult to specialist.

Our supervisors were very good. We felt comfortable. They gave discretion to us, but they still monitored and checked before the treatment was delivered.

RI2 page 7 paragraph 82

...we are given discretion to examine the patients from the beginning and complete the medical records.

R16 page 17 paragraph 46

We were given discretion to perform procedures, and we had to inform the patients about the risks.

RI2 page 167 paragraph 13

We did health promotion when we were placed in community health centre.

R16 page 19 paragraph 52

One of our compulsory tasks is to do health promotion in the community health centre, we have to many villages.

Progress to proficiency

RI1 page 4 paragraph 30-34

In the ward, we have to consult with the specialist. But in community health centre, we could handle ourselves.

RP5 page 13 paragraph 74-76

...must be held responsible, during internship they must learn that they are no longer students.

RP3 page 23 paragraph 166

Writing prescription needs to be improved, including the dosage, and how to administer the drug....I asked them to learn again.

RP6 page 4 paragraph 16-18

...their clinical decision making is good, and are able to handle patients on their own.

307

308 **Information Management Skills**

309 The one theme that emerged in this topic was medical record literacy, which describes the
310 extent to which interns understand how to complete medical records and how to use them.
311 Interns from both groups explained that they understood how to complete the medical
312 records but lacked perspectives on how to make use of them.

313 **Self-Insight and Personal Development**

314 With regards to this topic, three themes were identified, namely internal motivation, learning
315 opportunities, and constructive feedback. Both groups – interns and supervisors – agreed on
316 how internships would enhance the interns’ competencies depending on their internal
317 motivations. Interns who were serious about using every opportunity to improve their

318 competencies would achieve more, but those who lacked the internal drive tended to be
319 passive and missed many chances to learn. The second theme was learning opportunities.
320 While interns are regarded as a full GP with their own professional discretion and
321 responsibilities, the hospitals, house doctors, and other health professionals offered them
322 unlimited learning opportunities. Both supervisors from CBC and SBC groups confessed that
323 they monitored how the interns performed from a distance. With regards to constructive
324 feedback, the CBC group explained that feedback was given both formally and informally. To
325 avoid embarrassment, constructive feedback was purposefully given after the intern had
326 finished interacting with the patient. SBC interns explained that they felt the logbook was not
327 useful. The supervisors were focused on giving feedback related to the cases, rather than on
328 the interns' performance (such as communication or clinical skills). CBC interns highlighted
329 that compatibility between interns and their supervisors affected the success of the
330 supervisory process. The following excerpts (Table 8) portray this topic and the three related
331 themes.

332 Table 8. Excerpts for self-insight and personal development

Competence-based curriculum	Subject-based curriculum
Internal motivation	
RP1 page 18 paragraph 120 <i>As supervisors, we could not force the interns. It is up to them how they self-assess their ability.</i>	RP4 page 8 paragraph 26 <i>The seriousness, the willingness and the interest of each intern are different.</i>
RP1 page 3 paragraph 68-71 <i>For clinical skills, the interns must be eager to try and practice. At the beginning, they are scared to try...</i>	RP4 page 12 paragraph 44 <i>To what extent interns make use of the opportunities to advance their competencies, knowledge and skill depend on interns' initiative and motivation.</i>
Learning opportunities	
RP1 page 1 paragraph 2 <i>Interns are given full discretion to perform GP duties, however opportunities to increase their proficiency are wide open.</i>	RP5 page 10 paragraph 58 <i>In the hospitals, the basic clinical procedures are performed by the nurses; although the interns know the theories. So, they learn from the nurses to improve their proficiency</i>

Constructive feedback

RI3 page 21 paragraph 98

Feedback from the supervisors...are mostly related to the cases, not directly about how is the interns' professionalism.

EI4 page 15 paragraph 92

We had never received reprimand from the supervisors if we did it right or wrong

RI5 Page 20 paragraph 70

Feedback is given in a group. When an intern is dealing with the patients, the others are observing from the other side behind the curtain. The next day, we discuss.

RI6 page 22 paragraph 66

We rarely met, because the supervisors also work in other hospitals. So, every week we met to have feedback or to inform if there are any complaints or suggestions.

RI5 page 19 paragraph 68

The supervisors provided feedback after we finished handling the patients. They did not embarrass us in front of patients...

RI6P22 paragraph 66

...every week we met anywhere, at times in canteen, the supervisors asked if we have complaints or suggestions, or if we have problems with the nurses.

333

334 **Professionalism**

335 There were two themes for the topic of professionalism, namely transition and working
336 culture. Both groups confirmed that, at the beginning, the interns were required to make
337 adjustments within the work environment in the hospitals. They needed to increase their
338 speed and accuracy when examining patients. After completing the internship, most interns
339 had increased their professionalism. However, CBC supervisors expressed their concerns that
340 their interns were frightened to handle the patients directly, lacked the ability to build rapport
341 with patients, and lacked confidence and prowess in decision making. Therefore, at the
342 beginning, CBC interns needed more intensive supervision, and gradually, by the end of the
343 program, they had gained confidence and courage in handling patients independently. SBC
344 supervisors did not report such situations. They observed that SBC interns demonstrated a
345 sense of responsibility in handling patients.

346 On the theme of working culture, CBC interns expressed worry about their ability to
347 build relationships with colleagues and other health professionals, as well as concerns over a

discrepancy between the ideal situation and the practical one, which imposed an ethical dilemma. In contrast, the SBC interns explained that, in real work environments, emotions were involved when dealing with patients as well as when building relationships with colleagues. Such aspects were not found when they practiced laboratory skills or conducted clinical rotations. Cultural differences also affected how they handled relationships with patients and colleagues. Table 9 shows the excerpts for this topic and its two related themes.

Table 9. Excerpts for professionalism

Competence-based curriculum	Subject-based curriculum
RP3 page 3 paragraph 69-71	Transition
<i>...the interns are scared to handle the patients on their own even after a while some are still scared.</i>	P 3 p paragraph 16 <i>Ability for decision making of interns is good, the communication is also good.</i>
RP3 page 18 paragraph 95	RI3 P5 paragraph 28
<i>...I told them: when you speak with patients is not like that, you need to relax the patients by behaving as their friends.</i>	<i>During internship, professional behavior is challenging, because we handle the patients with all their emotions. As time goes by, we becomes more mature.</i>
RP3 page3 paragraph 14	RI6 P 18 paragraph 50
<i>Compared to the previous intern, they had the same level of knowledge. But, I was confused why the current interns are getting less confidence, less courageous, and less adeptness.</i>	<i>When we were medical students in clinical rotation, our main target was to pass the exam. But now, our target is to heal the patients. Our sense of responsibility to the patients emerges.</i>
Working culture	
RP3 p20 paragraph 105	RP5 P3-4 paragraph 16-18
<i>The interns must have a courage to take the risks, but they are not. They are cry babies, they do not have resilience, they want to get things easily.</i>	<i>We emphasize that interns should have good teamwork and cohesion, and give positive responses.</i>
Rp2P7 paragraph 40-42	RI6P 8 paragraph 24
<i>Conflicts with nurses due to different expectations...building relationships with medical specialist, with nurses, with midwives...need time and effort to adjust. This varies among interns, around 1-2 months.</i>	<i>Because we are given responsibility to handle patients, we have to be professional.</i>
R16P 11 paragraph 30	
	<i>Senior nurses are dominant to perform basic clinical procedures, like suturing. At times, the interns are given</i>

RI5 P 4 paragraph 16

chances by their supervisors, but the seniors nurses tend to do it themselves.

We are faced with ethical dilemma when we see unstandardized practices. Do we have to be consistent or to lower the standards so that we are accepted by our working environment.

R13 P 5 paragraph 28

Different characters of interns with different cultural backgrounds, at times, emotions rise up. They are also affected by their university background.

RI5 P20 paragraph 74

Senior staffs, either in district hospitals or in community health centres tend to dominate.

355

356 DISCUSSION

357 Our assumption that CBC would perform better in all aspects of areas of competence
358 are not supported by these qualitative findings. This is in line with the findings from a study
359 in Groningen in the Netherlands, which also claimed that their findings could not bear the
360 assumption that a CBC would yield better prepared graduates (13). In contrast, a study in the
361 UK yielded a different result concerning the effect of implementing a CBC in medical
362 education on perceived preparedness for practice. Between 1998 and 2006, all UK medical
363 schools reformed their curriculum to a CBC. Within each cohort, a significantly higher
364 percentage of the respondents from schools with the CBC felt well prepared. Some of the
365 improvement might be explicable to the curricular changes (15).

366 In this study, we obtained surprising results on the topics of effective communication,
367 clinical skills, health management, and professionalism. We expected that CBC interns would
368 demonstrate better performance in these areas because CBC has a more structured and better
369 designed curriculum for communication and clinical skills, as well as a new skills laboratory
370 provided with improved clinical skills equipment. However, the findings were to the
371 contrary.

372 A study in Kenya showed comparable results: they discovered a consensus across
373 subjects on deficiencies in interns' clinical skills and experience of handling clinical problems.
374 Supervisors in general provided critical comments regarding interns' competencies, whereas
375 interns showed more concerns about their weaknesses. Supervisors expected better
376 performance on surgical procedures than how interns anticipated to. Perception of medical
377 graduates' unpreparedness seemed to be caused by a failure to apply the apprenticeship
378 model in medical school and insufficient exposure to district hospitals prior to graduation
379 (15). Another study in the UK investigated the induction process as a solution to improving
380 interns' preparedness. It was discovered that the induction program was more useful when
381 conducted at the beginning than in later rotations, and longer inductions were preferable to
382 shorter ones. When interns were placed in clinical departments, medical interns lacked proper
383 inductions, particularly regarding their roles and responsibilities in particular departments,
384 including where to find equipment and documents, who to contact and how to contact them,
385 as well as local preferences, policies and procedures (16). In this study, the induction was
386 performed twice. The first time was in the District Health Office regarding the internship
387 program, and the second was in an orientation that each hospital gave to new interns.
388 However, the induction was performed as a one-way lecture. Therefore, some interns had
389 ethical dilemmas when they experienced that the suturing procedures were not the same as
390 the procedures they practiced in the skills laboratory.

391 Brennan et al. studied the transition of medical students to junior doctors at the
392 Peninsula Foundation School in the UK. They discovered that although curriculum reforms
393 had been conducted, most participants still perceived that the transition was pressured.
394 Coping with their freshly attained responsibility, surviving uncertainty, dealing with multi-
395 professional teams, encountering the sudden death of patients, and feeling unsupported were
396 important themes. However, the stress of transition could be lessened by the level of clinical

397 experience obtained during their undergraduate years. They suggested that medical schools
398 need to ensure that students are given prior exposure to clinical environments that allow for
399 continuing “meaningful” contact with patients and increasing opportunities to assume a role
400 as junior doctor, even as students (17). This study confirms Brennan’s findings. Also, in
401 Indonesia, the new CBC structured the clinical rotation into defined activities, such as clinical
402 tutorials, bedside teaching, etc. During their clinical rotation, medical students had fewer
403 opportunities to take full responsibility for patients, causing them to feel unprepared for their
404 responsibilities in their internships. The interns confirmed that they studied the patients in
405 fragmented sequences, and their major concern had been how to pass the exams, rather than
406 fully learning the process of patient management.

407 Lempp et al. studied teamwork and support among interns in the Pre-Registration
408 House Officer (PRHO) program. Most PRHOs described having positive experiences during
409 their involvement as full members of their first ward teams. This furnished them with
410 increasing confidence and competence in this early period of career transition. However, a
411 number of organizational barriers were pinpointed, e.g., incomplete teams and shift work,
412 which produced problems in their integration (18). In this study, both interns from CBC and
413 SBC confirmed that team work among interns could run well, although there were variations
414 in interns’ characters and habits. However, team work with nurses did not always run
415 smoothly. They found that different expectations and the dominance of nurses hindered the
416 teamwork. Concerning support from supervisors and the hospitals, they had positive
417 impressions. The learning opportunities given by the supervisors and the hospitals were
418 immense; some interns seriously responded to these opportunities, while others were more
419 relaxed.

420 For the management of health problems, CBC interns lacked confidence and courage
421 compared with SBC interns. Both interns believed themselves to have sufficient knowledge
422 and clinical skills, but CBC interns experienced more difficulties with patient management,
423 whereas SBC interns had more confidence handling patients. This might be due to a more
424 structured clinical rotation in CBC, which reduces the authenticity of the clinical environment.
425 This finding confirmed the results of the study by Prince et al. that junior doctors discerned
426 confidence with regard to knowledge and skills but encountered difficulties with patient
427 management, practical matters, and their role in the interprofessional medical team (3).

428 In a study conducted by Sturman et al. in the University of Queensland Medical School
429 involving 15 interviews, participants described the intern transition as physically, mentally,
430 and emotionally fatiguing. They had to cope with long days, administrative and clinical tasks,
431 frequent interruptions, and time pressures; identify priorities; deal with criticism without
432 compromising key relationships; communicate concisely; understand team roles (including
433 their own status within hospital hierarchies); and negotiate conflict. Participants explained
434 that they experienced a decrease in self-confidence and difficulty maintaining self-care and
435 social relationships (19). These results substantiated the findings from this study that the CBC
436 interns also experienced decreasing confidence and difficulty in communication with nurses
437 and patients.

438 This study enriches the literature on the transition period for medical students to
439 become proficient independent practitioners. Some findings corroborate previous studies.
440 But, there were findings that are also contrary to expectations concerning CBC. Some
441 limitations of this study were the small number of subjects and only one province was
442 included. A larger scale study should be performed in the future, involving more provinces,
443 district hospitals, and community health centers with a wider context.

444

445 **CONCLUSIONS**

446 The findings of this study revealed irregular patterns between CBC and SBC interns
447 in their overall experience and seven areas of competencies, namely effective communication,
448 clinical skills, scientific foundation, management of health problems, information
449 management skill, self-insight and personal development, and professionalism. We could not
450 conclude that a competency-based medical curriculum better prepared medical graduates for
451 internship. However, the irregularities revealed that students' preparedness for professional
452 practice was different, and so were the expectations from supervisors. This study provides
453 qualitative evidence that the interns' performances reflect a variety of responses to the
454 hospital context and their experiences during the clinical rotation. SBC interns showed more
455 confidence and courage in the handling of patients, compared with CBC interns. This might
456 be attributed to the fact that, in the old SBC, the clinical rotation was less structured, and
457 students had more opportunities to experience directly the wide variety of the district hospital
458 environments used for the internship program. Accordingly, medical schools need to place
459 medical students for a longer period in several district hospitals during their clinical rotation,
460 rather than to concentrate the clinical rotation in the main top referral teaching hospitals.
461 Additionally, it is recommended that more learning opportunities be provided to handle
462 patients comprehensively under tighter supervision. This will allow a gradual transition.

463

464 **LIST OF ABBREVIATIONS**

465 CBC: competencies-based curriculum
466 GP: general practitioners
467 SBC: subject-based curriculum

468

469 **ETHICAL APPROVAL AND CONSENT TO PARTICIPATE**

470 The medical interns and the supervisors were contacted individually and were explained
471 about the research. Upon agreement of participation, they were invited to the Department of
472 Medical Education at Faculty of Medicine Universitas Gadjah Mada on an agreed date. They
473 were given a written guidelines for the interview and further explained the details of the
474 qualitative interview which were conduted by one researcher and one transcriber who
475 recorded the interviews in the closed room. After they understood the research protocol and
476 agreed to participate, we asked them to sign the written informed consent. All the
477 interviewees completed the informed consent.

478 I declare that this qualitative research has been reviewed by the Institional Review Board
479 under the Medical and Health Research Ethics Committee (MHREC) of Faculty of Medicine
480 in accordance with the institutional guidelines. After fulfilling the ethical approval
481 procedures, the Ethical Clearance was granted by the Medical and Health Research Ethics
482 Committee (MHREC) of the Faculty of Medicine, Public Health and Nursing, Universitas
483 Gadjah Mada and Dr Sardjito Hospital with the issuance of Ethical Clearance Letter No.
484 KE/FK/526/EC/2016.

485

486 **CONSENT FOR PUBLICATION**

487 Not applicable

488

489 **AVAILABILITY OF DATA AND MATERIALS**

490 Transcripts and data are available upon request, by contacting the corresponding author
491 (titi.savitri@ugm.ac.id or +6281328780180). On behalf of all authors, I confirm that all methods
492 were carried out in accordance with relevant guidelines and regulations.

493

494 **COMPETING INTERESTS**

495 The authors declare that they have no competing interests related to this study.

496

497 **FUNDING**

498 This study was funded by the Faculty of Medicine, Public Health and Nursing, Universitas
499 Gadjah Mada.

500

501 **AUTHORS' CONTRIBUTIONS**

502 *Titi Savitri Prihatiningsih*: wrote the proposal, conducted qualitative interviews, conducted
503 initial and final coding, analyzed themes, wrote the manuscript and reviewed the final
504 manuscript.

505 *Prattama Santoso Utomo*: assisted in writing the proposal, conducted qualitative interviews,
506 conducted initial coding, and reviewed the manuscript

507 *Hikmawati Nurrokhmanti*: conducted initial coding, and reviewed the manuscript.

508 *Mora Claramita*: conducted interviews, and reviewed the manuscript.

509 *Albert Scherpbier*: reviewed the manuscript.

510

511 **ACKNOWLEDGEMENTS**

512 The author would like to thank Maastricht Medical School, Maastricht for coaching during
513 the designing and implementation of the competencies-based medical curriculum under the
514 Netherlands Post Secondary Training (NPT) Project between 2006-2014.

515

516 **REFERENCES**

- 517 1. Wijnen-Meijer M, Burdick W, Alofs L, Burgers C, Ten Cate O. Stages and transitions in
518 medical education around the world: clarifying structures and terminology. Med Teach.
519 2013;35(4):301-7.
- 520 2. Goldacre JM, Taylor K, Lambert WT. Views of junior doctors about whether their
521 medical school prepared them well for work. Neonatal Intensive Care [Internet].
522 2011;24(2):46. Available from:

- 523 http://search.ebscohost.com/login.aspx?direct=true&db=jlh&AN=2011217136&site=eh
524 ost-live%5CnPublisher URL: www.cinahl.com/cgi-
525 bin/refsrv?jid=559&accno=2011217136.
- 526 3. Prince KJAH, van de Wiel MWJ, van der Vleuten CPM, Boshuizen HPA, Scherpbier
527 AJJA. Junior doctors' opinions about the transition from medical school to clinical
528 practice: a change of environment. *Educ Health*. 2004;17(3):323–31.
- 529 4. Ochsmann EB, Zier U, Drexler H, Schmid K. Well prepared for work? Junior doctors'
530 self-assessment after medical education. *BMC Med Educ*. 2011;11(1):99.
- 531 5. Muthaura PN, Khamis T, Ahmed M, Hussain SRA. Perceptions of the preparedness of
532 medical graduates for internship responsibilities in district hospitals in Kenya: a
533 qualitative study Curriculum development. *BMC Med Educ [Internet]*. 2015;15(1):178.
534 Available from: <http://dx.doi.org/10.1186/s12909-015-0463-6>
- 535 6. Miranda-Ackerman RC, Barbosa-Camacho FJ, Sander-Möller MJ, Buenrostro-Jiménez
536 AD, Mares-País R, Cortes-Flores AO, et al. Burnout syndrome prevalence during
537 internship in public and private hospitals: a survey study in Mexico. *Med Educ Online*
538 [Internet]. 2019;24(1):1593785. Available from:
539 <https://doi.org/10.1080/10872981.2019.1593785>
- 540 7. Oshikoya KA, Senbanjo IO, Amole OO. Interns' knowledge of clinical pharmacology
541 and therapeutics after undergraduate and on-going internship training in Nigeria: a
542 pilot study. *BMC Med Educ*. 2009;9(1):50.
- 543 8. McGaghie WC, Miller GE, Sajid AW, Thelder TV. Competency-basedcurriculum
544 development in medical education: an introduction. 1st ed. Switzerland: WHO; 1978. 1–
545 90.
- 546 9. Scicluna HA, Grimm MC, Osullivan AJ, Harris P, Pilotto LS, Jones PD, et al. Clinical
547 capabilities of graduates of an outcomes-based integrated medical program. *BMC Med*
548 *Educ*. 2012;12(1):23.
- 549 10. Laven G, Keefe D, Duggan P, Tonkin A. How was the intern year?: self and clinical
550 assessment of four cohorts, from two medical curricula. *BMC Med Educ*. 2014;14(1):123.
- 551 11. Albanese MA, Mitchell S. Problem-based learning: a review of literature on its outcomes
552 and implementation issues. *Acad Med*. 1993;68(1):52–81.
- 553 12. Blake RL, Hosokawa MC, Riley SL. Student performances on Step 1 and Step 2 of the
554 United States Medical Licensing Examination following implementation of a problem-
555 based learning curriculum. *Acad Med*. 2000;75(1):66–70.

- 556 13. Kerdijk W, Snoek JW, Van Hell EA, Cohen-Schotanus J. The effect of implementing
557 undergraduate competency-based medical education on students' knowledge
558 acquisition, clinical performance and perceived preparedness for practice: a
559 comparative study. BMC Med Educ. 2013;13(1):76.
- 560 14. Braun V, Clarke V. Thematic analysis. In: Cooper H, Camic PM, Long DL, Panter AT,
561 Rindskopf D, Sher KJ (Eds.). APA handbooks in psychology®. APA handbook of
562 research methods in psychology (Vol. 2). Research designs: Quantitative, qualitative,
563 neuropsychological, and biological. American Psychological Association; 2012:57-71.
564 <https://doi.org/10.1037/13620-004>
- 565 15. Muthaura PN, Khamis T, Ahmed M, Hussain SRA. Perceptions of the preparedness of
566 medical graduates for internship responsibilities in district hospitals in Kenya: a
567 qualitative study. BMC Med Educ [Internet]. 2015;15(1):178. Available from:
568 <http://dx.doi.org/10.1186/s12909-015-0463-6>
- 569 16. Miles S, Kellett J, Leinster SJ. Foundation doctors' induction experiences approaches to
570 teaching and learning. BMC Med Educ. 2015;15(1):1-8.
- 571 17. Brennan N, Corrigan O, Allard J, Archer J, Barnes R, Bleakley A, et al. The transition
572 from medical student to junior doctor: today's experiences of Tomorrow's Doctors. Med
573 Educ. 2010;44(5):449-58.
- 574 18. Lempp H, Cochrane M, Rees J. A qualitative study of the perceptions and experiences of
575 pre-registration house officers on teamwork and support. BMC Med Educ. 2005;5:10.
- 576 19. Sturman N, Tan Z, Turner J. "A steep learning curve": junior doctor perspectives on the
577 transition from medical student to the health-care workplace. BMC Med Educ.
578 2017;17(1):92.
- 579