

Original Research Article

Prevalence of Dunning Kruger effect in first year medical students in a tertiary care hospital

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ABSTRACT

Background: Dunning Kruger (DK) effect refers to overestimation of one's ability which is attributed to their inadequacy of metacognitive skills i.e., the low-performing individuals are often nescient of their incompetence which leads them to reach fallacious conclusions and make regrettable choices. Objectives of the study were to assess the degree of DK effect among the first-year medical students and to compare the associated socio-economic variables.

Methods: A descriptive cross-sectional study was conducted among the interested first-year medical students of North Bengal medical college and hospital from March 2021 to April 2021 using a questionnaire. Responses were recorded in Microsoft excel 2017, analysed, and presented in form of tables and charts following principles of descriptive statistics.

Results: The overall prevalence of DK effect was found to be 78.38% among the first-year medical students. Higher prevalence was observed among females (80.28%) as compared to males (75%). Students having low study hours (79.13%), no academic achievements (77.5%), and greater hours of sleep (79.74%) manifested more predisposition to DK effect.

Conclusions: In our research, we have noticed a higher DK effect among the first-year medical students, which might hamper the quality of treatment and patient care in the future. Proper orientation and counselling methods are required to overcome this phenomenon.

Keywords: DK effect, Socio-economic variables, Metacognitive skills

INTRODUCTION

Dunning-Kruger (DK) effect was named after the study by eminent social psychologists, Justin Kruger and David Dunning "Unskilled and unaware of It: how difficulties in recognizing one's own incompetence leads to inflated self-assessments."¹ It refers to the phenomenon of illusory superiority in which low-performing individuals overestimate their abilities to a much greater extent. Individuals who lack awareness of metacognition are often caught in a bubble of inaccurate self-perception who tend to misjudge their level of competence. In other words, low-performing individuals are unaware of their competence and thus end up overestimating their abilities.

A lot of explanations about the effect have been put forward. Dunning and Kruger in their study demonstrated that lack of metacognitive ability interferes with an individual's ability to estimate their problem-solving potential and also proposed a relationship between task performance, metacognition, and judgemental accuracy. Krueger and Mueller illustrated the "regression to mean" hypothesis which stated "people at all skill levels are prone to similar difficulties in estimating their relative performance. Their subjective estimates of performance are imperfectly correlated with objective performance measures, so their estimates of relative performance regress toward the mean."³ Burson et al assessed how the level of difficulty of the task affect people's judgment of their performance, and propounded the noise-plus-bias

hypothesis “the primary drivers of miscalibration in judging percentile are general inaccuracy due to noise as well as overall biases that arise from the task difficulty level”.²

One of the contributing factors that can lead to this effect is that sometimes meagre knowledge about a particular subject can make people believe that they know anything and everything that is required to know. As per the old saying “A little learning is a dangerous thing”, people with a tiny bit of awareness about a domain, believe him or her to be an expert of that particular domain. Other factors include heuristics or mental shortcut which reduces the cognitive load while making a decision. In our daily life, we come across several situations where we have to deal with a ton load of information, so we organize them and interpret them with our own level of cognition and while doing so we misjudge our capabilities and make fallacious decisions.

So, who is most vulnerable to this delusion? Each one of us because we all have concealed bits of incompetence we don't recognize.⁸ People who are experts in a particular field often think that their expertise spreads to areas with which they are less acquainted. Dunning and Kruger also showed that people who lived on the extreme end of the competence spectrum were often pragmatic about their knowledge and capabilities.⁶

Rationale for the study

The DK effect has a substantial impact on the quality of medical education as this might hamper the decision-making capabilities of an individual. Those having higher DK are more susceptible to overestimating their capabilities and making erroneous decisions.

It was also deemed vital to conduct this study among the medical students because as per available literature no study has been conducted on the prevalence of the DK effect on medical students in the country. Moreover, the reason for the selection of the study population was that the first-year medical students are on the stepping stones of their learning curve and early detection coupled with proper orientation will help them to tackle challenging clinical scenarios in the future.

General objective

The general objective was to assess the prevalence of DK effect on first year medical students in a tertiary care hospital.

Specific objective

The specific objectives were to evaluate the prevalence of DK effect on first year medical students of North Bengal medical college and hospital, Darjeeling and to compare the associated socio-economic variables.

METHODS

Study type

The study type was of institutional-based descriptive study.

Study design

The study was of cross-sectional study.

Study setting

The study carried out at North Bengal medical college and hospital, Darjeeling.

Study duration

The study conducted from March 2021 to April 2021.

Study population

First-year medical students of North Bengal medical college and hospital, Darjeeling.

Exclusion criteria

Those who were unavailable during the collection tenure or unwilling to give consent were excluded from the study.

Sample size

The study included 111 students out of 200 first-year medical students.

Sampling technique

Complete enumeration used as a sampling technique in this study.

Study tools

Study tools used were informed consent form and questionnaire.

Study technique

Study technique studied was of face-to-face interview.

Data collection and analysis

Students of the first year M. B. B. S were explained about the DK effect. After obtaining written informed consent from them, face to face interview was conducted and responses were entered into schedule. Data collected from analysing the answers were presented and analysed in Microsoft excel 2017. Obtained data was presented in the

form of charts and tables following the principles of descriptive statistics.

Study variables

Socio-demographic profile

In this-Age, sex, annual family income, place of residence, and present place of stay and socio-economic status according B. G. Prasad scale were studied.⁴

Personal information

It included hours of phone usage, hours of sleep, hours of study, plans of pursuing higher education, past academic achievements, relationship status, past history of psychological disorder, regular medication and any knowledge about DK.

Ethical issues

Permission for the study was obtained from the institutional ethics committee, North Bengal medical college and hospital. Written informed consent was obtained from the study participants after complete elucidation about the topic and assured anonymity.

RESULTS

The study population was 111. Of which 71 (63.96%) were males and 40 (36.04%) were females.

Table 1: Distribution of study population based on sex.

Sex	Frequency	Percentage (%)
Male	71	63.96
Female	40	36.04

Table 2 showed that majority of males (80.28%), belonging to age group 17-19 (80%), residing in PG (88.89%), having total hours of sleep >6 hours (86.67%), weekly phone usage of 27-47 h (84.91%), average hours of study 3 to 6 h (79.31%), having academic achievements (80.65%), in relationship (88.24%), with plans to pursue higher education (80.46%), with an unclear past mental history (78.50%), regular medication (100%), having past knowledge of DK (84.62%) demonstrated DK effect. Students belonging to socio-economic status III (92.86%) exhibited DK and majority of those belonging to SES II (42.67) had no DK effect. Students involved in extra-curricular activities like music, dance, sports/others manifest a higher DK effect than those who are not.

Table 2: Distribution of presence of DK based on socio-economic variables.

Socio economic variables	No (%)	Yes (%)	Total (%)
Age group (Years)			
17-19	13 (20)	52 (80)	65 (100)
20-22	10 (23.25)	33 (76.74)	43 (100)
≥23	1 (33.33)	2 (66.67)	3 (100)
Sex			
Male	14 (19.72)	57 (80.28)	71 (100)
Female	10 (25)	30 (75)	40 (100)
Place of residence			
Rural	7 (15.90)	37 (84.09)	44 (100)
Urban	17 (25.37)	50 (74.62)	67 (100)
Present place of stay			
Home	3 (27.28)	8 (72.72)	11 (100)
Hostel	18 (21.42)	66 (78.58)	84 (100)
PG	1 (11.11)	8 (88.89)	9 (100)
Rented house	2 (28.57)	5 (71.43)	7 (100)
Total hours of sleep			
Less than 6	2 (13.33)	13 (86.67)	15 (100)
6-8	16 (20.25)	63 (79.75)	79 (100)
Greater than 8	4 (23.52)	13 (76.48)	17 (100)
Hours of phone usage (weekly)			
6-26	9 (23.07)	30 (76.93)	39 (100)
27-47	8 (15.09)	45 (84.91)	53 (100)
48-68	6 (37.5)	10 (62.5)	16 (100)
≥69	1 (33.33)	2 (66.67)	3 (100)
Average hours of study per day			
Less than 3	10 (21.74)	36 (78.26)	46 (100)
3-6	12 (20.69)	46 (79.31)	58 (100)
Greater than 6	2 (28.57)	5 (71.43)	7 (100)

Continued.

Socio economic variables	No (%)	Yes (%)	Total (%)
Any academic achievements			
No	18 (22.5)	62 (77.5)	80 (100)
Yes	6 (19.35)	25 (80.65)	31 (100)
Relationship status			
Yes	2 (11.76)	15 (88.24)	17 (100)
No	13 (16.45)	66 (83.65)	79 (100)
It's complicated	9 (60)	6 (40)	15 (100)
Plans to pursue higher education			
Still thinking	7 (29.17)	17 (70.83)	24 (100)
Yes	17 (19.54)	70 (80.46)	87 (100)
Past mental history			
Not sure	23 (21.50)	84 (78.50)	107 (100)
Yes	1 (25)	3 (75)	4 (100)
Regular medication			
Yes	0 (0)	2 (100)	2 (100)
No	24 (22.09)	85 (77.91)	109 (100)
Past knowledge of DK			
No	22 (22.45)	76 (77.55)	98 (100)
Yes	2 (15.38)	11 (84.62)	13 (100)
Socio economic status			
I	14 (21.21)	52 (78.79)	66 (100)
II	6 (42.86)	8 (57.14)	14 (100)
III	1 (7.14)	13 (92.86)	14 (100)
IV	3 (17.65)	14 (82.35)	17 (100)
Extra-curricular activity			
Dance	1 (20)	4 (80)	5 (100)
Music	3 (16.67)	15 (83.33)	18 (100)
Sports	5 (12.5)	35 (87.5)	40 (100)
Others	6 (17.65)	28 (82.35)	34 (100)
None	9 (52.94)	8 (47.06)	17 (100)

Data in parenthesis indicates percentage.

DISCUSSION

DK is a cognitive bias whereby people with minimal understanding in a given intellectual or social domain greatly overestimate their own knowledge or competence in that domain. People mistakenly assess their cognitive ability as greater than it is. They make mistakes and take poor decisions. This has implications on the individuals' sufferers and society at large. Efficient medical practise requires absence of DK along with a calm and composed attitude to emerge as trained and confident doctors. In a study conducted among the students' taking statistics courses at central Michigan university found that DK effect exists and low performing students apparently overestimate their performance; while the high performing individuals, on the contrary, dramatically underestimate their performance to a larger extent.⁷ Absence of any available literature made it indispensable to conduct this study among the medical students of North Bengal medical college. In our study, we have assessed the degree of DK effect among first year medical students in a tertiary care hospital.

The study population includes 71 males (63.96%) and 40 females (36.04%) out of the total 111 students. Most of

the students showing DK effect have permanent residence in the rural areas (84.09%). SES III students (92.86) had a more tendency to show DK effect in contrast to SES II students (42.86) who showed the least tendency. Students with a plan to pursue higher education exhibit more DK than those who are not sure of their plans. To achieve a good clinical knowledge and training, students must be inclined towards having complete knowledge about the subject rather than superficial learning. Those with superficial knowledge often narrow down their scope to one particular domain and assume their expertise in every domain.

Table 2 also showed that students having study hours typically in the range of 3-6 hours had more propensity of DK as compared to students who had study hours > 6 hours. This is because more duration of quality study helps in improving the depth of knowledge. Pupils with <6 hours of sleep (86.67%) showed more DK effect in comparison to those having >8 hours of sleep (76.48%). The absence of adequate sleep in an individual interferes with concentration and reasoning capabilities.

Students belonging to the age group of 17-19 (80) showed higher DK effect compared to those in the age group of

20-22 (76.74), which can be attributed to the fact that with advancing age, people tend to acquire more experience in a certain domain, which in turn, imparts in-depth knowledge about that domain.

The DK effect is a phenomenon, which focuses on people's general inaptitude to recognize their lack of abilities, often leading them into a sense of illusory superiority due to the miscalibration of their capabilities.¹ People mistakenly assess their cognitive ability as greater than it is. They make erroneous choices but the knowledge gap prevents them from identifying their errors. Poor performers lack the very expertise needed to recognize how badly they are doing.⁸

Future scopes

Since the study was conducted among first year medical students it gave only a small insight. Longitudinal study involving all medical as well as non-medical professionals would give us a broader outlook. A study can be conducted in relation to various psychological disorders and their effect on DK effect. NMC has introduced a new competency based medical curriculum and its effect on DK effect can be studied.⁵

CONCLUSION

The conclusion of the study was to ensure quality education among the medical students and proper treatment of various patients, in-depth knowledge becomes quintessential. Thus, every measure should be taken to minimize the DK effect among medical students.

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