Undergraduates' Knowledge of Women's Reproductive Functioning: Addressing Misinformation in a University Course

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BACKGROUND

Misunderstandings about women's reproductive functioning and contraceptives abound in the U.S. (for example, see Kaye et al., 2009). The literature on young adults' understanding of women's natural reproductive functioning and contraceptives suggests that (mis)education on such matters has a profound impact on health decisions (Edwards et al., 2000; Picardo et al., 2003). From an educational standpoint, it is imperative to understand what (mis)information students bring to the classroom; pedagogically, it is important to know whether efforts to address such misunderstandings with presentation of scientific evidence are effective.

Research Questions:

Part 1:

a. Where do students obtain information about women's health and reproductive functioning? How much do they trust those sources?

b. Do students who obtain information from relatively reputable sources give more accurate responses to questions about normal functioning?

Part 2:

a. How deeply entrenched are students' (mis)understandings? Can common misunderstandings be corrected by exposure to scientifically-based readings, activities, and lectures?

MATERIALS AND METHODS

The opportunity to participate in a project to assess undergraduate knowledge about and attitudes towards women's bodies and lives was presented to the students of "C105: The Biology and Culture of Women's Bodies" during the first week of the Fall 2013 semester (near the end of August). This course was designed to expose students to the variation in women's bodies and lives using a biocultural framework (including an emphasis on the evolution of women's bodies and the cultural environments modern women face). Questionnaires were designed to ascertain where students obtain information about women's health and reproductive issues, how trustworthy those sources are perceived to be, and to collect knowledge and attitudinal information regarding various aspects of women's reproductive health and lives. 81 students volunteered to complete this questionnaire in August. During the final week of the Fall 2013 semester, in December, students were again asked to complete a nearly identical questionnaire to assess if/how their knowledge and attitudes were altered after being exposed to scientifically-based readings, activities, and lectures on these issues. 35 students (43% of the original 81) re-took the questionnaire.

About the participants:

Of the 81 August participants, 75 were female and 5 were male. The majority of these students were freshmen (37%) and sophomores (34%), though Juniors and Seniors also participated (20% and 9%, respectively). With this class distribution, the age distribution is not surprising: 54% of participants were 18 and 19 years old, 37% were 20 and 21 years old, and the rest 22 years and older (the age range was 18-56, with all but the 56-year old individual between 18 and 27).

RESULTS

Part 1:

a. Where do students obtain information about women's health and reproductive functioning?

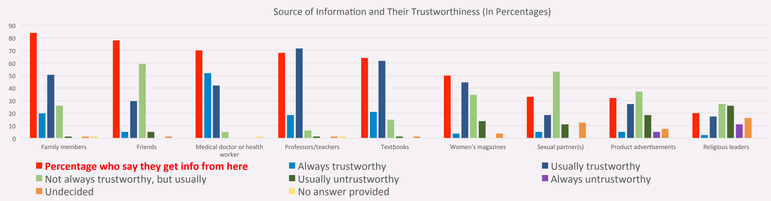


Figure 1: Sources of information and students' evaluation of how trustworthy they are (in percentages). Data in this figure is from responses to August questionnaire (n = 81).

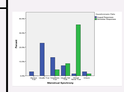
b. Do students who obtain information from relatively reputable sources give more accurate responses to questions about normal functioning?

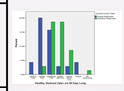
According to multinomial regression analysis, there are no significant relationships between source of information and responses to statements given in August. This may be due to lack of variation in reported sources of information (for example, a majority of students reported getting information from the same sources, especially family and friends).

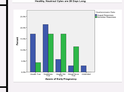
Part 2:

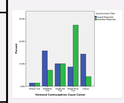
a. How deeply entrenched are students' (mis)understandings? Can these misunderstandings be corrected by exposure to scientifically-based readings, activities, and lectures?

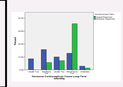
Statement	Sample size and Significance Level	Interpretation/Explanation
The theory of evolution can be useful for understanding modern women's bodies and health	n = 30; p > 0.05	Most students agreed with this statement in both August and December.
Individuals' health status is the product of interactions between their genes and their physical environments	n = 34; p > 0.05	Most students agreed with this statement in both August and December.
NORMAL FUNCTIONING:		
Women who spend a lot of time together will menstruate together	n = 32; p < 0.05	Shift from belief to disbelief that menstrual synchrony occurs in humans
Healthy, normal cycles are 28 days long	n = 31; p < 0.05	Shift from narrow definition of "healthy" cycles to acceptance of variability in cycle length
Women know within the first 6 weeks that they are pregnant	n = 34; p < 0.05	Shift from assumption that awareness of early pregnancy is common
Women's bodies are designed to block pregnancy in the case of rape	n = 32; p > 0.05	Very few students thought that this was true in August or December.
UNINTENDED PREG		
Unintended pregnancy is a problem that only affects poor women	n = 35; p > 0.05	Very few students thought that this was true in August or December.
unintended pregnancy is a problem that only affects teenagers	n = 35; p > 0.05	Very few students thought that this was true in August or December.
HORMONAL CONTRACEPTIVES		
Hormonal contraceptives cause some forms of cancer	n = 24; p < 0.05	Shift away from belief that hormonal contraceptives cause cancer from August to December
Hormonal contraceptives can harm a woman's long-term ability to have children	n = 32; p < 0.05	Shift away from belief that hormonal contraceptives cause long-term infertility
Antibiotics make birth control pills unreliable	n = 25; p > 0.05	Most students agreed with this statement in both August and December.
ABORTION		
Having an abortion will cause a woman to become depressed	n = 33; p < 0.05	Shift away from belief that abortion causes depression in women from August to December
Surgical abortions are very dangerous for women	n = 31; p < 0.05	Shift away from belief that surgical abortions are "very dangerous" for women from August to December
Having an abortion increases a woman's chances of getting cancer later in life	n = 21; p < 0.05	Shift away from belief that abortion causes cancer in women from August to December
STD		
Wearing a condom will protect you from sexually transmitted diseases	n = 34; p < 0.05	P-value indicates shifts observed in belief that wearing a condom will protect one from STDs, but graph shows these shifts were not particularly meaningful.
People who have sexually transmitted diseases have obvious symptoms	n = 35; p > 0.05	Very few students thought that this was true in August or December.

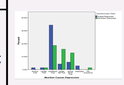


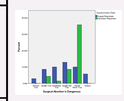


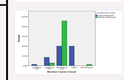












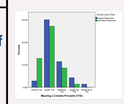


Figure 2. Changes in responses to selected statements in August vs. December questionnaires, according to Wilcoxon signed rank sum test.

DISCUSSION, LIMITATIONS, AND FUTURE DIRECTIONS

Part 1:

Sources of information and trustworthiness:

- Students get their information about women's health and reproductive issues from a variety of sources (see Figure 1).
- It is interesting to note that in some cases a majority of students say they get information from sources that they themselves perceive as less trustworthy. For example, 84% of students obtain information from family members, though only 50% rate family members as even "usually trustworthy."
- Future studies should consider not only where individuals obtain information, but also how much those sources actually influence their thinking on various issues (for example, see Kaye et al., 2009) and why individuals rely on less-than-trustworthy sources.

Sources of information and questionnaire responses:

- No significant relationships were found between sources of information and responses to select statements on the August questionnaire.
- Asking students to rank sources of information and using repeated questioning for each statement may yield stronger relationships (for an example of the latter, see Picardo et al., 2003).

Part 2:

Responses in August and Changes in responses from August to December:

- *August responses:* For many of the statements addressing natural reproductive functioning and/or contraceptives and abortion, many students agreed with popular misconceptions. Interestingly, however, most students did reject or accept some ideas that are/have been perpetuated in popular culture (for example, the idea that women's bodies can "block" pregnancy in the case of rape).
- Significant shifts were seen in responses to many of the statements (for example, that hormonal contraceptives cause long-term infertility). This is promising for health educators, as this is evidence that exposing students to scientifically-based information in readings, activities, and lectures can address commonly-held misunderstandings.
- Notably, in response to open-ended questions on the December questionnaire, many students remarked that they thought differently about women's bodies and/or felt "empowered" by having scientific evidence to support their beliefs.
- A potential limitation of these findings is that only 43% of the initial questionnaire respondents re-took the questionnaire in December.
  - Those who did not re-take the questionnaire may have had different experiences over the course of the semester. However, given that there were no statistically significant differences in the answers provided on the August questionnaire between those who took the questionnaire once and those who took it twice, it is reasonable to believe that the 35 participants who re-took the questionnaire represent the class as a whole.

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