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What is really important to this generation of medical students? A look back into a college pathways program

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Abstract

BACKGROUND

Surveys of college student attitudes and life plans conducted prior to the COVID-19 pandemic have been attributed to the "Generation Z" effect. Few scientifically valid studies have addressed these changes after the pandemic, though many opinion pieces have expressed medical educators perceive that almost everything has changed. This longitudinal study reports an annual measure of college students' opinions during a medical school pathway program at a regional campus. The Treatment Options Opinion Survey (TOOS) included 5 medical and 6 social items and has been used each year since 2005.

METHODS

The TOOS was administered on the first and last days of the 3–4 week summer College Rural Scholar (CRS) program. The survey began with the prompt: "Indicate your opinion concerning the importance of understanding the following items in choosing the best treatment option for your patient." Each of the 11 TOOS items used a 5-point response scale (1 = strongly disagree to 5 = strongly agree). The study included 87 pre-medical CRS participants from the 2016–2019 summers (pre-COVID, termed the "previous cohort") and 2022–2025 (termed the "COVID-era cohort"). Distributions and means were calculated and analyzed using the Kruskal-Wallis one-way analysis of variance. Statistical significance was defined as $p < .05$.

RESULTS

The change after the program was largely in the expected direction, but there were no statistically significant differences in importance of traditional medical items, which were consistently ranked as high importance before and after the program in both student cohorts. Of the six social items, most showed a significant increase in measured importance after the program by both COVID- era (2022-2025) and previous (years 2016-2019) student cohorts with two exceptions.

"Understanding how ready the patient is to make changes" was much more important to the COVID- era student cohort. In contrast, there was no statistical increase in this item's importance for the previous cohort from pre- to post-program. Similarly, "understanding the health beliefs held by the patient" was rated significantly more important by the COVID-era student cohort, with no significant change observed in the earlier group.

CONCLUSION

Medical educators have recognized that almost nothing is the same since the 2020 pandemic. The fundamental aspects of good doctoring remain, but Gen Z learners—shaped by the world-shattering events of their formative years—carry these experiences into their early professional identity development. This unique longitudinal study of a homogeneous pre-medical population suggests that these students naturally seek a more egalitarian patient-physician relationship and place greater emphasis on the patient's beliefs and readiness for change. As these

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students enter medical school, it is important for medical educators to appreciate that this shift has already occurred, while awaiting further studies in more diverse settings.

Keywords: Gen Z, pre-med, summer program, survey

Introduction

Over the last five years, medical educators have reported significant perceived changes in student attitudes towards work and interactions with patients. Some have viewed this as lapses in professional behavior expected of future physicians and others have simply labelled it as a "problem" among the younger "Gen Z" learners. The gap in understanding is that all previous generational studies were done prior to the COVID disruption in the lives of Gen Z and none provided a longitudinal measure of premedical college students' opinions who are now in medical school. This allows an easy oversimplification of generational differences as the best way to understand the perceived changes. This study set out to address this problem.

In March 2020 educational institutions across the United States were tasked with navigating the COVID-19 pandemic. Students at all levels were moved to virtual learning. Many of the students impacted were from generation Z born between 1997 and 2012. Today, these students are in college or medical school. Those in college now were toddlers or in elementary school during the first news reports of major school shootings and in high school when the events that prompted the formation of the Black Lives Matter movement shook the country. They never experienced communication without the Internet and spend much time on social media forming relationships that for some mimic real communities.

This context is important, as the most complete model of professional identity formation assumes that medical students arrive to their training with a pre-existing identity.[1] A recent comparison of professional identity measures of medical students comparing pre- and post-COVID cohorts notes that without longitudinal measures there is no way to separate generational differences from those caused by the COVID and other social upheaval, but that perhaps for medical educators it is less important to know which was the primary cause than it is just to understand that almost nothing is the same.[2]

One regional campus group did report that in "career eulogies," a projective reflection exercise asking medical students to write what they want said about them at a retirement event, that there were clear changes. Medical students at all levels post-COVID included less mentions of the clusters of passion at work, compassion, and enjoyment in the work environment than the pre-COVID cohort.[2]

The cohort of students who are currently pre-med were in high school during the COVID upheaval and would have learned core social and educational skills in an online setting for almost 18 months. During this critical developmental period, science laboratory settings and social interactions would have been exclusively experienced through a screen.

The most frequently cited summary of Gen Z characteristics is based on a 2014 survey of 1000 college students.[3] Subsequent opinion pieces extrapolating these findings to medical students were published in 2018 and 2019 and express concern that the Gen Z focus on individual happiness could result in Gen Z physicians with less empathy.[4, 5, 6] The pre-COVID college student survey described Gen Z as needing to enjoy their work and seek a job that makes a difference and allows them to develop their existing passions, while simultaneously expressing that their happiness and pursuit of their passions outside of work may be more important.[7, pp 216-217] Their requirement that the job must also provide economic security may be the result of seeing their parents lose jobs and face much lower salaries during the Great Recession of 2007-2009. All these generalizations about Gen Z are based on surveys that predated COVID and the subsequent dramatic shift to virtual instruction and community that current college students experienced in high school. A remarkably negative opinion piece by an anesthesia

faculty near retirement based only on his experience with no formal evidence provided encapsulates the stereotype. He describes Gen Z as prone to more tardiness, more days missed without excuses, more emotional outbursts when challenged regarding inappropriate clinical decisions, and subsequently more letters of professional warning.[8]

There have been only a few reports of longitudinal data including medical students, and none with pre-medical students. Here we report the longitudinal data from a College Rural Scholar program that began in 2002 and used the same opinion measures since 2016. This look back into the medical school pipeline may be useful for medical educators as they consider curriculum changes and adaptations to support these Gen Z students.

College Rural Scholar (CRS) Program

The CRS program was begun in 2002 to provide support for rural pre-meds, largely from small regional colleges, who had demonstrated interest in rural practice.[9] The program invites applicants to be nominated as early as their first college year by their pre-medical advisor. The requirements are that they have graduated from a high school in a town with a population under 30,000, have an interest in a rural medical career, at least a 24 score on the ACT, and at least a 3.0 college GPA. Successful applicants attend the CRS summer program after their first term of college.

CRS live in Madisonville, Kentucky (population 20,000, home to the regional campus) for 3-4 weeks. These students shadow primary care physicians in surrounding even more rural small towns, assist with free school and sports physical examinations, meet with local key informants to discuss the current health resources available in their county, and obtain guidance from current M3/M4 medical students at the regional campus (see Table one). A final report is compiled by the students and presented at the end of the program. Students who demonstrate excellence are invited to interview for early assurance admission with assignment to the regional campus. Students selected for early assurance must meet a minimum GPA of 3.3 and an MCAT of 500 (24 in the old scoring) and complete all required pre-medical courses.

Table 1. University of Louisville School of Medicine Trover Campus College Rural Scholar Program Summary*

Goal	Method	Measure
1) Promote understanding of primary care in a rural setting	a) Precepting in a rural area b) County health care assessment including key informant interviews	a) Case study discussion b) County health assessment report c) Preceptor evaluation d) Treatment Options Opinion Survey (TOOS)
2) Develop understanding of probabilistic clinical reasoning	a) Team-based case study assignments b) Student presentations of common definitions (sensitivity, specificity, Bayesian logic)	Case study discussion
3) Design efficient processes for early adolescent health evaluation and anticipatory guidance	a) Team-based assignments b) Provide patient education during school/sports physical examinations (PE)	a) Final written "script" for patient education b) Props/materials gathered c) "Teach-back" results from adolescents d) Written evaluation feedback from nurses and parents
4) Meet specific need expressed by the community	Provide free school/sports PE at a time and place chosen by community	a) Average 80 exams provided each summer b) Feedback from community staff and parents
5) Discover health care barriers and obstacles	a) Discuss access with parents during PE b) Make referrals through school personnel	a) Session review with community staff b) County needs assessment c) TOOS
6) Experience interdisciplinary care	Hold PE sessions in health department with their nurses as co-examiners	a) Feedback from nursing and school staff b) County needs assessment
7) Understand local beliefs	a) Discuss risk-taking with families during PE (e.g. 4-wheeler use) b) Discuss usual diet and exercise routines c) Friday morning reflections	a) Written "script" for patient education b) County needs assessment c) TOOS

*Republished from reference number 9

CRS has been effective, with 62% entering medical school and 50% of those completing two CRS summers settled into rural practice at the last published report.[9] This previous publication compared students' opinions about importance of understanding items needed to choose a treatment option for their patient and found no significant difference in the importance of traditional medical items before and after the program.[9] However, post-CRS students ranked six out of nine social items to be more important after completing the program. This would suggest that students who complete CRS demonstrated a higher level of understanding of the social aspects of health. Also, 80% strongly agreed that they were comfortable planning and implementing a community health project (the free school physicals).

Methods

The study population included all College Rural Scholar participants for the 2016-2019 summers (pre-COVID, termed "previous cohort") and 2022-2025 (termed "COVID era cohort"), excluding the years 2020-2021 as being amid rapidly changing events. Response rate was 100% except for one student who joined the program after the first week in 2017. Most

CRS were either rising sophomores or juniors in college. The Treatment Options Opinion Survey (TOOS) is anonymous and did not include age. Using standard ages for most CRS, 82/87 (94%) were Gen Z, 49/87 (56%) identified as women and 70/87 (80%) were from self-identified small towns.

The TOOS was administered on the first day of the 3–4-week program (pre-test) and the last day of the program (post-test). With the introduction "Indicate your opinion concerning the importance of understanding the following items in choosing the best treatment option for your patient," each of the 11 TOOS items had a 1 through 5 response option with 1= strongly disagree to 5= strongly agree. The distribution and means were calculated and analyzed using the Kruskal-Wallis one-way analysis of variance utilizing IBS SPSS Statistics 30.0. Statistical significance was defined as $p<.05$. The Institutional Review Board (IRB) of the local hospital approved the study as exempt.

Results

The change after the program was largely in the expected direction but there were no statistically significant differences in importance of traditional medical items, with these items ranked as high importance before and after the program in both student cohorts (Table 2). Of the six social items (Table 3), most showed a significant increase in measured importance after the program by both COVID era (2022-2025) and previous (years 2016-2019) student cohorts with two exceptions. "Understanding how ready the patient is to make changes" was much more important to the COVID era student cohort and in fact in the previous cohort there was no statistical increase in the pre-to post program survey. The same is true of "understanding the health beliefs held by the patient," with a significantly higher importance placed by the COVID era student cohort and no statistical increase in importance from pre-to post program results in the previous (years 2016-2019) student cohort.

Table 2. TOOS Medical Items

College Rural Scholars Treatment Options Opinion Survey* Medical Items						
	2016-2019			2022-2025		
	Mean Pre-Test n=36	Mean Post-Test n=37	p-Value	Mean Pre-Test n=50	Mean Post-Test n=50	p-Value
Understanding the anatomy involved	4.42	4.51	0.47	4.44	4.24	0.15
Understanding the biochemical abnormality involved	4.33	4.22	0.95	4.12	4.02	0.73
Understanding the mechanism of the medications used	4.39	4.22	0.49	4.14	3.96	0.47
Understanding the laboratory abnormalities involved	4.17	4.22	0.67	4.00	3.86	0.47
Understanding the imaging (x-ray, ultrasound, etc.) abnormalities	4.28	4.32	0.61	4.16	3.82	0.06

***Indicate your opinion concerning the importance of understanding the following items in choosing the best treatment option for your patient, 1=least important, 5=most important**

Table 3. TOOS Social Items

College Rural Scholars Treatment Options Opinion Survey* Social Items						
	2016-2019			2022-2025		
	Mean Pre-Test n=36	Mean Post-Test n=37	p-Value	Mean Pre-Test n=50	Mean Post-Test n=50	p-Value
Understanding how ready the patient is to make changes	4.19	4.32	0.35	4.20	4.76	<0.001
Understanding the health beliefs held by the patient	3.81	4.19	0.4	4.12	4.52	0.02
Understanding where the patient lives	3.72	4.35	0.00	3.60	4.30	<0.001
Understanding who prepares the patient's meals	3.50	4.33	0.00	3.18	4.29	<0.001
Understanding the role of faith in the patient's life	3.56	4.08	0.01	3.82	4.22	0.04
Understanding the kinds of work the patient does	3.67	4.35	0.01	3.76	4.16	0.02

***Indicate your opinion concerning the importance of understanding the following items in choosing the best treatment option for your patient, 1=least important, 5=most important**

The opinions of each student cohort as they arrived to the program are shown in tables 4 and 5. There was no statistically significant difference between the two time periods but in the COVID era cohort there was already a trend for less importance placed on biochemical abnormality and the mechanism of medications and more importance placed on the patient health beliefs that may have reached significance with a larger sample.

Table 4. TOOS Pre Test Medical Items

College Rural Scholars Treatment Options Opinion Survey* Pre Test Medical Items			
	Mean 2016-2019 n=36	Mean 2022-2025 n=50	p Value
Understanding the anatomy involved	4.42	4.44	0.92
Understanding the imaging (x-ray, ultrasound, etc.) abnormalities	4.28	4.16	0.40
Understanding the mechanism of the medications used	4.39	4.14	0.07
Understanding the biochemical abnormality involved	4.33	4.12	0.08
Understanding the laboratory abnormalities involved	4.17	4.00	0.28

***Indicate your opinion concerning the importance of understanding the following items in choosing the best treatment option for your patient, 1=least important, 5=most important**

Table 5. TOOS Pre Test Social Items

College Rural Scholars Treatment Options Opinion Survey[1] Pre Test Social Items			
	Mean 2016-2019 n=36	Mean 2022-2025 n=50	p Value
Understanding how ready the patient is to make changes	4.19	4.20	0.99
Understanding the health beliefs held by the patient	3.81	4.12	0.10
Understanding the role of faith in the patient's life	3.56	3.82	0.25
Understanding the kinds of work the patient does	3.67	3.76	0.82
Understanding where the patient lives	3.72	3.60	0.6
Understanding who prepares the patient's meals	3.50	3.18	0.15

[1] Indicate your opinion concerning the importance of understanding the following items in choosing the best treatment option for your patient, 1=least important, 5=most important

Discussion

Most medical educators have become aware that there has been a fundamental change in their learners over the last five years. Much of this has been attributed to characteristics of Gen Z, largely based on a relatively small, uncurated surveys of college students done before COVID.[3, 7] The report here provides a unique longitudinal view of a relatively homogeneous population over the key time period.

These carefully selected college rural scholars are typical of the group of Gen Z students who are medical students now and will be over the next few years. The key professional identity model used in medical education assumes that students arrive to each stage of professional development with an identity developed by their previous experiences.[1] Whether it be generational differences prior to COVID or the prolonged effects of virtual learning and relationships built via screen time during COVID, the change is apparent.

Both pre-and post-COVID cohorts arrived at the CRS program with great importance placed on typical medical items, although the COVID era cohort expressed lower importance of the mechanism of medications and the biochemical abnormality involved. Both cohorts arrived placing a much lower importance on social items, but the COVID era cohort already had begun to place a higher importance on understanding the health beliefs held by a patient. Although complete data are not available, those published previously from CRS 2009 to 2016 are similar to the pre-COVID cohort described here.[9]

The 3-to-4-week intensive CRS program for both cohorts showed no pre-and post-program differences on typical medical items, as those were high at the beginning of the program. Both cohorts showed a significant increase in the social items after the program. The two exceptions provide a key insight into what might be different about the COVID era cohort. The previous cohort showed no real change after the program on the two key factors of understanding how ready the patient is to make changes and understanding the health beliefs held by the patient. The COVID era cohort had a highly significant increase after the program, suggesting that they gleaned something different from what was largely the same experience.

Limitations and Strengths

COVIDThis is a relatively small study of a highly selected pre-medical population at one rural regional campus. Any extrapolations should therefore be limited to similar populations. The data set also precedes sweeping administrative changes at the national level that occurred after the summer of 2025, which may have effects—such as COVID-like reverberations—that are not yet measurable. Strengths of the study include the nearly complete survey response rate and the unique longitudinal design, which asked identical questions at the same points in the program across the key time period.

The authors attempt to interpret these findings and consider their implications for medical education. A senior author (WC, a baby boomer), who has been

deeply involved with this program since its inception nearly 25 years ago, reflected that when the Gen Z medical student authors sought a project, this was the first topic that came to mind. His experience working with students and now with Gen Z family medicine residents highlighted a clear and dramatic change in the way they viewed the world. Rather than reinforcing negative stereotypes described in other publications, his perspective was that students readily embraced a more egalitarian relationship with patients and tended to undervalue—but not dismiss—traditional hierarchical elements of medicine. From their own perspective, the Gen Z medical student authors emphasized that the pandemic eroded public trust in medical providers. One author (AH) noted that this loss of trust will shape their future practice, as Gen Z physicians will encounter patients who are more skeptical of their providers' motives. This shift will likely produce a more questioning patient population, one with stronger convictions that their own beliefs matter more than in the past. Consequently, Gen Z students appear to prioritize developing trust and engaging patients as equal partners in the medical relationship.

Another student author (CM) noted that medical information is now so easily available on the Internet that it is less controlled by physicians. This egalitarian situation provides the opportunity for future physicians to approach the patient-physician relationship in a more open-minded manner where understanding the patient is more important than the opinions of the physician. If any of the stereotypes from pre-COVID studies about the strong individualism of this generation are accurate, the pandemic could have accentuated this. Therefore, students just assume that a more individualized approach to each patient will be required. One less idealized interpretation is also available. If Gen Z students truly have shorter attention spans and require instant feedback as the stereotype holds, they may choose to expend their energy efficiently. A patient who is not ready to change and doesn't share the beliefs of the physician might take longer to come around and the Gen Z student's attention may wane. This may allow Gen Z physicians to choose more carefully where and when to expend their energy. This is not so different from the very old "stages of change" model that implies that physicians should wait until patients are in the serious contemplation stage before energy is expended to get them to change.[10]

The other student author, also a CRS alumna (EB), suggests that Gen Z medical students see this time as a clear break from the older "one-size-fits-all" approach to medical care. As Gen Z is described as the most diverse generation to date, they may be more appreciative of understanding a variety of backgrounds. This naturally leads to seeking a more eclectic view of health and disease. Rather than the doctor's advice being the most important thing in the relationship, this emphasizes patient driven care. The Gen Z stereotype as a practical generation may allow them to accept other valid treatments that the patient prefers rather than what medical evidence supports as the single optimal choice. This emphasizes collaboration over prescription. The concept of holistic care with the patient as a partner and not just a compliant recipient appeals to Gen Z. This student describes the core driver of decision-making by Gen Z physicians as patient focused factors like motivation rather than standardized scientific values.

Conclusion

Medical educators have realized that almost nothing is the same since the 2020 pandemic. The fundamental aspects of good doctoring remain, but Gen Z learners who experienced all the world-shattering events of their young years carry these into their early professional identity development as physicians. This unique longitudinal study of a homogeneous pre-medical population shows they naturally seek a more egalitarian patient-physician relationship and place more emphasis on the patient's beliefs and readiness for change. Educators are also wise to remember that while generalizations about groups of students are useful, individualized, learner-centered educational approaches are still needed. Rather than viewing Gen Zs as "the other" that create difficulty for those responsible for existing curriculum and structure, this generation may just provide exactly what modern medicine needs.

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