# Response to Multiple Choice Question

As a graduate statistics student, I'll analyze the question about the purpose of randomization in the described vitamin E cancer study.

The correct answer is \*\*(A) To increase the accuracy of the research results.\*\*

## Explanation:

Randomization in experimental design serves a fundamental purpose: it creates comparable groups at baseline by distributing both known and unknown confounding variables evenly across treatment conditions. This is critical because:

1. When participants are randomly assigned to treatment groups (vitamin E at different levels vs. placebo), any differences in outcome (cancer development) can be more confidently attributed to the treatment rather than to pre-existing differences between groups.

2. Randomization helps eliminate selection bias and balances participant characteristics (both measured and unmeasured) across groups, which directly increases the internal validity and therefore the accuracy of causal inferences.

Options B, C, D, and E are incorrect for these reasons:

- Option B confuses randomization with random sampling. Randomization assigns participants to treatments; it doesn't determine who gets selected for the study.

- Option C misunderstands sampling error, which relates to how well a sample represents a population, not to treatment assignment.

- Options D and E incorrectly suggest randomization primarily addresses skewness in statistical distributions, when its primary purpose is to create comparable groups for valid causal inference.

In experimental design, randomization is foundational precisely because it enhances the accuracy of conclusions about treatment effects by controlling for confounding variables.