DATA MATTERS:

Health Statistics Can Empower Knowledge, Attitude, and Practice

Seventh-day Adventist educators worldwide get excited about pedagogies that increase students' knowledge skills and influence their attitudes and beliefs. Taylor asserts that one of the defining characteristics of Seventh-day Adventist education is commitment to excellence, which promotes whole-person development. This wholistic development is constructed when strong linkages are forged between knowledge and practice,[1] supported by positive attitudes and beliefs.

To make learning transformational, the developmental process connecting *knowledge, attitude,* and *practice* (KAP) must be intentional. We know that knowledge acquisition alone may not be powerful enough to change practice in a positive direction.[2] For example, the development of spirituality demands synchrony between these factors to be mature and authentic. Another critical area for the melding of KAP skills is in health education.

The objective of Adventist health education is to deliver knowledge in a manner that also shapes the student's attitudes regarding adopting good health habits and practicing a healthy lifestyle. This objective builds on the words of Ellen White: "In teaching health principles, keep before the mind the great object of reform—that its purpose is to secure the highest development of body and mind and soul."[3] The Seventh-day Adventist Church has a rich history of creating and promoting health and science education initiatives, textbooks, and curriculum resources that are used by educators at all levels to activate and accelerate learning. Examples of Adventist health education approaches are CELEBRATIONS®,[4] NEWSTART,[5] and CREATION.[6] (See Figure 1 on page 10.)

Research substantiates the benefits of Adventist health teachings but only when knowledge is translated into positive attitudes and practices by individuals. Findings from health research conducted among Seventh-day Adventists have indicated that Adventists who embrace healthy practices, as taught by the church, have increased life expectancy[7] and decreased risk for some types of cancer,[8] cardiovascular diseases,[9] and metabolic syndrome.[10]

In a 2016 study, Galvez et al. measured KAP variables among 1,442 Seventh-day Adventists in seven Adventist churches in metro Manila, Philippines. Of these respondents, more than half (55 percent) were between the ages of 18 and 35, with 70 percent having completed a college degree. The researchers found that knowledge of Adventist teachings about physical activity, as one example, was poor to average. Again, re-

BY DANIEL GANU, SUSAN M. BAKER, and JOSEPHINE GANU

lated to physical activity, attitudes were found to range between neutral and positive. Practice, in the area of physical activity, was poor to average.[11] This study is just one example that highlights the need for knowledge to be transformed into attitude and practice to gain benefits.

In 2019, researchers at the Adventist University of Africa, a General Conference postgraduate institution in Kenya, conducted a study within the geographical territories of the three Seventh-day Adventist divisions in Sub-Saharan Africa: East-Central Africa Division (ECD), Southern Africa-Indian Ocean Division (SID), and West-Central Africa Division (WAD). (See Figure 2.) The purpose of the study was to collect and analyze primary data from African Adventists related to their general health status and KAPs based on the CELEBRATIONS® health-education acronym. CELEBRATIONS® is a program created by the General Conference Health Ministries Department for health education in churches and schools (Figure 1).

Figure 1. Seventh-day Adventist Health Education Acronyms

CELEBRATIONS	CREATION	NEWSTART
• Choices	• Choice	• Nutrition
• Exercise	• Rest	• Exercise
• Liquids	• Environment	• Water
• Environment	• Activity	• Sunlight
• Belief	• Trust in Divine Power	• Temperance
• Rest	• Interpersonal Relationships	• Air
• Air	• Outlook	• Rest
• Temperance	• Nutrition	• Trust in Divine Power
• Integrity		
• Optimism		
• Nutrition		
• Social Support		

Note: CELEBRATIONS® was utilized in this study.

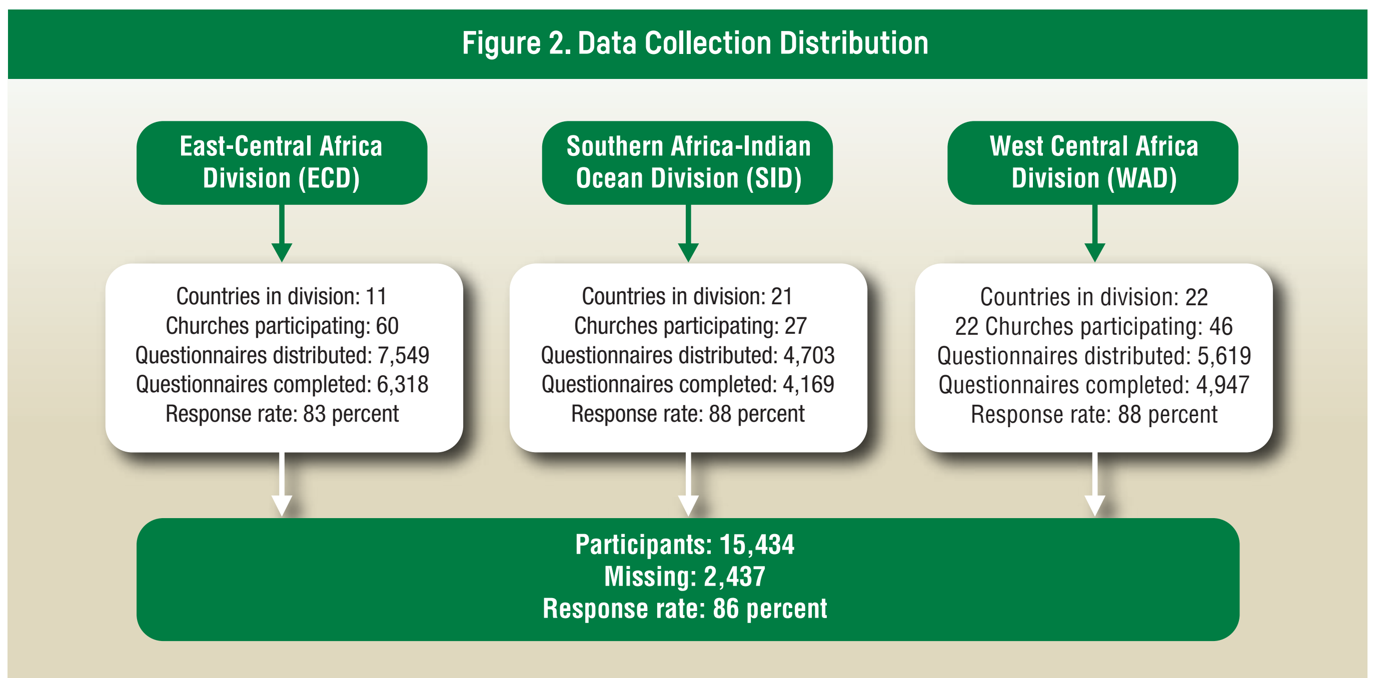
Methods

This descriptive study utilized a cross-sectional analytical design with data collected using a questionnaire and, thus, relied on self-reported data. The 213-item questionnaire contained closed- and open-ended items and was administered by trained research assistants.

Participants were randomly recruited from persons who met inclusion criteria at the various locations. Inclusion criteria were: (1) African ethnicity; (2) baptized member of the Seventh-day Adventist Church; (3) residence in one of the Seventh-day Adventist divisions in Africa; (4) 18 years of age or older; and (5) ability to commit approximately one hour to complete the questionnaire.

Recruitment of participants was based on grouping clusters of Adventist populations from the 34 African unions and church populations from rural and urban settings with small, medium, and large membership sizes. Proportional random sampling was used to recruit participants from each conference and resulted in collecting completed questionnaires from 15,434 participants (Figure 2). Incomplete or

Figure 2. Data Collection Distribution



damaged questionnaires (2,437) were not included in data analysis.

Permission for research with human participants was approved by the ethics committee of the National Commission for Science, Technology, and Innovation in Nairobi, Kenya. Each participant signed an informed-consent form before being allowed to take part in the study, after which he or she completed the questionnaire, which was available in English, Portuguese, French, and Swahili to accommodate the diverse language groups. Statistical analysis was performed using IBM SPSS version 23.

Results

The African Seventh-day Adventist Health Study used the acronym CELEBRATIONS® to assess the level of KAP of the health principles among Adventists in Africa. As shown in Table 1, 50.6 percent of participants were male, and 41.4 percent were female (8.0 percent did not answer the question regarding gender). The largest group of respondents was between 18 and 30 years of age (46.2 percent) and single in regard to marital status (46.0 percent single; 44.5 percent married or separated; and 9.5 percent other or missing). Slightly more than half of the participants had either no formal education (3.0 percent) or a primary or secondary education (50.6 percent). Participants with bachelor's and professional degrees made up 30.4 percent of those surveyed, while 7.2 percent had a postgraduate degree, and 8.8 percent did not respond to this question. In regard to employment status, 48.4 percent were employed; 26.5 percent were students.

Table 2 on page 12 shows the level of participants' knowledge about health principles taught by the church. Overall, the participants showed an good level of knowledge, with a mean score of 3.94 on a 5-point Likert Scale (SD = 0.58). This indicates that the respondents had above-average knowledge of the health principles, with knowledge about certain CELEBRATIONS® principles being slightly higher than about others.

Table 1: Demographic Profile of Participants

	Item	Frequency	Percentage
Gender	Male	7,817	50.6
	Female	6,383	41.4
	Total	14,200	92.0
	Missing	1,234	8.0
	TOTAL	15,434	100.0
Age	18-30 years	7,130	46.2
	31-50 years	5,220	33.9
	51 and older	2,064	13.4
	Total	14,414	93.5
	Missing	1,020	6.5
	TOTAL	15,434	100.0
Marital status	Single	7,105	46.0
	Married	6,626	42.9
	Separated	252	1.6
	Divorced	142	0.9
	Widow/Widower	469	3.0
	Total	14,594	94.4
	Missing	840	5.6
	TOTAL	15,434	100.0
Educational attainment	No formal education	456	3.0
	Primary/Secondary	7,803	50.6
	Bachelor/Professional degree	4,679	30.4
	Postgraduate degree	1,112	7.2
	Total	14,161	91.2
System	Missing	1,384	8.8
	TOTAL	15,434	100.0
Employment status	Employed	7,460	48.4
	Unemployed	2,399	15.6
	Student	4,087	26.5
	Total	14,042	90.5
	Missing	1,488	9.5
	TOTAL	15,434	100.0

As depicted in Table 3 on page 12, the participants showed an overall positive attitude toward the health principles taught by the church (mean score = 3.99 on a 5-point Likert scale; SD = 0.72). Having a positive attitude toward a health principle plays a critical role in whether the

Table 2: Knowledge of the Health Principles of the Seventh-day Adventist Church

Item	Number	Mean	Standard Deviation	Interpretation
Knowledge about Choices	15,304	4.1018	.63166	Good
Knowledge about Exercise	15,301	4.0143	.61482	Good
Knowledge about Liquids	15,372	4.3774	.61080	Excellent
Knowledge about Environment	15,299	3.9841	.59684	Good
Knowledge about Belief	15,335	4.0159	.54348	Good
Knowledge about Rest	15,237	3.8388	.58945	Good
Knowledge about Air	15,375	4.1910	.59459	Good
Knowledge about Temperance	15,258	3.4253	.40707	Good
Knowledge about Integrity	15,279	3,9426	.58741	Good
Knowledge about Optimism	15,138	3.6944	.63509	Good
Knowledge about Nutrition	15,335	3.9052	.58565	Good
Knowledge about Social Support	15,225	3.7956	.54589	Good
Average Mean		**3.9405**	**0.57856**	**Good**

Scale of Interpretation for the Mean of Knowledge
1.00-1.79 = Poor; 1.80-2.59 = Fair; 2.60-3.39 = Average; 3.40-4.19 = Good; 4.20-5.00 = Excellent

Table 3: Attitude Toward the Health Principles of the Seventh-day Adventist Church

Item	Number	Mean	Standard Deviation	Interpretation
Attitude toward Choices	15,029	4.2710	.72273	Extremely Positive
Attitude toward Exercise	15,018	4.0472	.75942	Positive
Attitude toward Liquids	14,999	4.2235	.70863	Extremely Positive
Attitude toward Environment	14,982	4.1503	.70382	Positive
Attitude toward Belief	14,967	4.2862	.67912	Extremely Positive
Attitude toward Rest	14,968	4.2004	.70439	Extremely Positive
Attitude toward Air	14,936	4.1891	.69856	Positive
Attitude toward Temperance	14,903	4.1348	.72086	Positive
Attitude toward Integrity	14,878	3,0971	.73544	Neutral
Attitude toward Optimism	14,857	4.0573	.72038	Positive
Attitude toward Nutrition	14,856	3.0905	.74584	Neutral
Attitude toward Social Support	14,962	4.1640	.69841	Positive
Average Mean		**3.9926**	**0.7165**	**Positive**

Scale of Interpretation for the Mean of Attitude
1.00-1.79 = Extremely negative; 1.80-2.59 = Negative; 2.60-3.39 = Neutral; 3.40-4.19 = Positive; 4.20-5.00 = Extremely positive

health principle is practiced. From these results, it is reasonable to expect good translation of knowledge and attitudes into practice behavior, which is examined in the next section. Similar to results in the area of knowledge, variation existed among CELEBRATIONS® principles, with slightly larger differences in several areas. It is interesting to note that there were four extremely positive findings for attitude regarding choices, liquids, belief, and rest. Comparing this to the level of knowledge, attitudes toward liquids is the only finding on which the majority of respondents achieved a score of excellent. Also, temperance was rated lowest in the level of knowledge, although it was rated highest in practice. The attitude of the participants toward integrity and nutrition was neutral.

Table 4 on page 13 reveals that the practice of health principles received a lower rating (mean score of 3.61 on a 5-point Likert Scale, SD = 0.73) than knowledge and attitude. The score for practice of exercise, environment, and nutrition was average, although exercise and environment scored positive attitude.

The Knowledge, Attitude, Practice model is a common method for understanding and analyzing human responses to particular phenomena, especially in the field of health studies. The connection between people's attitudes and practices is well established in psychology and health-behavior theory.[12] The implication of the positive relationship between KAPs is that it will equip the individual to accept the challenge of educating, motivating, and adopting Adventist health principles in order to modify his or her lifestyle.

Discussion

This study revealed information regarding knowledge about, attitudes toward, and practice of Adventist health principles among Seventh-day Adventists in Africa. Although participants reported a good level of knowledge of general health principles and positive attitudes toward them, this

Table 4: Practice of the Health Principles of the Seventh-day Adventist Church

Item	Number	Mean	Standard Deviation	Interpretation
Practice of Choices	15,087	3.4312	.61977	Good
Practice of Exercise	14,959	2.8852	1.00469	Average
Practice of Liquids	15,095	3.9046	.71323	Good
Practice of Environment	15,273	3.3998	.84903	Average
Practice of Belief	15,168	3.9073	.74820	Good
Practice of Rest	14,861	3.4499	.65141	Good
Practice of Air	14,602	3.7586	.99626	Good
Practice of Temperance	15,146	4,6846	.57444	Excellent
Practice of Integrity	15,236	3,7081	.65369	Good
Practice of Optimism	15,094	3.6056	.63820	Good
Practice of Nutrition	15,147	3.0207	.55238	Average
Practice of Social Support	15,056	3.5100	.76396	Good
Average Mean		**3.6055**	**0.73044**	**Good**

Scale of Interpretation for the Mean of Practice
1.00-1.79 = Poor; 1.80-2.59 = Fair; 2.60-3.39 = Average; 3.40-4.19 = Good; 4.20-5.00 = Excellent

was not fully reflected in their practice. Other studies have corroborated that differences exist between the levels of knowledge, attitude, and practice.[13]

Our findings demonstrated that respondents' overall attitudes toward CELEBRATIONS® were slightly higher than their overall knowledge. This shows an overlap between knowledge and attitudes. It is likely that even if respondents lacked complete or accurate knowledge about CELEBRATIONS®, they could still develop a positive attitude toward health principles because they believe in the health teachings of the church. In fact, our results showed that "liquids" was the only health principle about which the respondents had excellent knowledge. This clearly indicates a need to deliberately place greater emphasis on health education to improve the health literacy of church members in Africa. Lack of accurate or complete information can lead to misguided information, particularly in an infodemic[14] era.

A review of the age of participants shows that many were relatively young, which is reflective of the population throughout the continent of Africa. It is imperative, therefore, that educators use their opportunities with students to forge connections between health education and KAPs as part of formative wholistic education.

Furthermore, the success of health education depends on the extent to which educators use a variety of pedagogies to integrate health principles with academic learning at all levels. An example of this type of interdisciplinary instruction is found in the Ariel Trust, located in Liverpool, United Kingdom. The Trust is an educational charity that uses mathematics lessons to teach students about the misuse of alcohol.[15] Students learn about the dangers of alcohol (a health principle) by exploring alcohol consumption statistics (an evidence-based approach) and associated risks (a health practice) within math lessons (an interdisciplinary approach to a non-health subject). Similarly, Youth Alive, a Seventh-day Adventist program, is designed to build resilience among adolescents and young adults by inspiring and equipping them to make healthy choices.[16]

Targeting youth at all educational levels is practical, sustainable, and strategic. For educators in Africa, and elsewhere, this is relevant—Africa has the largest concentration of young people in the world, and the African Adventist membership is largely made up of youth.[17] However, Adventist educators in all parts of the world should commit to integrative health education as an intentional pedagogy. Historically, teachers have played a significant role in influencing students. They can generate enthusiasm, confidence, and joy in students in a way that will motivate them to adopt a consistently healthy lifestyle throughout their lifetime. Committed Adventist teachers who are passionate about God and health principles are a resource to Adventist education of inestimable worth.[18]

Recommendations

Based on the findings from the composite data generated in the study,[19] there is no doubt that education is a potential cornerstone for enhancing knowledge-attitude-practice regarding CELEBRATIONS®. We recommend that teachers at all levels use a variety of approaches to promote Adventist health teachings, including CELEBRATIONS®, in an attempt to build on positive attitudes, while reinforcing knowledge about the importance of various health principles and how they can be better translated into behavior. For example, educators need to explain to students that temperance is not only applicable to people who have a health crisis (whether obesity, addiction, or any other health challenge), but for everyone. Other specific areas that need to be underscored and clarified include proper knowledge regarding optimism, social support, rest, nutrition, integrity, and environment and how they influence health.

Following are three practical classroom recommendations designed to

be implemented relatively easily and not requiring additional courses or a new curriculum:

1. Use critical-thinking approaches to integrate health principles in your teaching. The classroom setting is a favorable ground to foster deep, substantive thinking about health. Critical thinking is a form of reflective thinking that can stimulate deep self-assessment about students' health choices and lifestyle. Asking questions that require synthetic, analytic thinking is a key characteristic of teaching critical thinking. Educators can facilitate strategic conversations in the classroom by asking questions and actively listening to students to understand their attitudes toward and understanding of Adventist health principles. Such approaches enable the instructor to connect with students and stimulate deep thinking and lasting learning. Best-practices use of critical-thinking methods demands that teachers cultivate sensitivity, alacrity, and emotional intelligence.[20]

2. Model healthy behavior. Role modeling is "teaching by example and learning by imitation."[21] Adopting a healthy lifestyle cannot be accomplished just by acquiring knowledge, although the value of factual and practical knowledge must not be ignored. Students also need to be inspired to do more than have a good attitude about health principles, although attitudes can pave the way for behavior change. Students are constantly evaluating their teachers to see if they are "walking the talk." As a teacher, practice the health principles that you teach. For instance, students should see educators drinking pure water habitually, regularly engaging in some form of exercise, demonstrating a positive outlook, having an abiding trust in God, etc. In this way, the teacher's behavioral commitment to health principles can show students how healthy living looks.

3. Integrate teaching of health principles into academic calendars/curricula. Educational institutions must endeavor to create opportunities for health promotion, health literacy, and awareness based on health-education acronyms such as CELEBRATIONS®. Thinking about effective pedagogy should include using multidisciplinary, interdisciplinary, and transdisciplinary approaches,[22] as well as collaboration with Health Ministries Departments, hospitals, clinics, and healthcare personnel.

Conclusion

The African Seventh-day Adventist Health Study identified the level of knowledge, attitude, and practice of health principles among Adventists in Africa, who reported a good knowledge of and a positive attitude toward health principles. It is easy to assume that all Adventists have the right knowledge about health teachings and practice accordingly. However, there is a need to deliberately place greater emphasis on health education to improve health literacy and further translate knowledge and attitudes into maximized practice. This need exists throughout Adventist education at all levels, where educators have an opportunity to introduce knowledge, cultivate its conversion to positive attitudes and encourage transformational practice that is vital for effective health education outcomes. Since educators play a critical role in moving change initiatives forward successfully, it is incumbent on Adventist educational institutions and educators to explore the recommendations suggested by this study and utilize evidence to integrate health principles and academic learning. ✐

This article has been peer reviewed.

Daniel Ganu, DrPH, *is a Professor of Public Health and currently serves as the Coordinator for the Master of Public Health de-*

gree program at the Adventist University of Africa, Nairobi, Kenya. He has published research articles in international peer-reviewed journals. His research interests are in children's health, drug and substance abuse, spiritual health, mental health, and health promotion.

Susan M. Baker, DSc, PT, *is a physical therapist and educator who was the former Director of Research and Faculty Development and an Associate Professor in Public Health at the Adventist University of Africa, Nairobi, Kenya. She has worked in various health-care sectors, and public and private universities. Her research interests are rehabilitation, SOTL, and health education/promotion.*

Josephine Ganu, PhD, *is an Associate Professor of Management and currently serves as the Director of Research and Grants at the Adventist University of Africa, Nairobi, Kenya. Dr. Ganu received her PhD in Commerce from the University of Santo Tomas, Philippines. Her current research interest includes employees' health and wellbeing, corporate social responsibility, organizational behavior, and workplace spirituality.*

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