

# Has Diarrhea Ceased to be a Concern in Persons Living With HIV? Results From a Cross-sectional Study

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## Abstract

Diarrhea has been associated with HIV throughout the epidemic. Few recent studies have addressed diarrhea in persons living with HIV (PLWH) despite evolving knowledge and ever-changing practice standards. The fact that patient care has become more complex, with comorbid conditions requiring additional attention without additional time allotment, potentiates the risk of common symptoms being overlooked. Patients ( $n = 190$ ) 18 years and older, living with HIV, completed a questionnaire collecting information specific to attitudes, definitions, and beliefs regarding diarrhea. Of the 190 participants, only 5.3% said that they had diarrhea, but 11.1% described their bowel movements as being in the group associated with diarrhea. Approximately, 93.7% of the participants defined diarrhea as either soft or watery; 34.2% defined frequency as more than three times per day, but 64.2% said that it would have to be more than three times per day to mention it to a provider. PLWH continue to experience diarrhea warranting assessment and discussions between the PLWH and the provider.

**Key words:** bowel habits, cross-sectional study, health literacy, patient perspective, quality of life

During the early years of the HIV epidemic, most persons living with HIV (PLWH) experienced diarrhea associated with infectious agents. Diarrhea was also a major contributor to the wasting syndrome that was often noted in PLWH during that era (Grimes & Grimes, 1994). Since the introduction of combination antiretroviral medications in the mid-1990s, improved immune reconstitution has resulted in a reduced prevalence of diarrhea caused by infectious agents. Unfortunately, many of these medications, particularly protease inhibitors (PIs), are associated with chronic diarrhea (MacArthur & DuPont, 2012; Sherman & Fish, 2000).

Over the last decade, PIs have been increasingly replaced by integrase strand transfer inhibitors, which seem to have less chance of inducing diarrhea (Panel on

Antiretroviral Guidelines for Adults and Adolescents, 2020). However, these drugs are often administered in combination with emtricitabine, which is reported to have a risk of diarrhea that is greater than 10%, and tenofovir alafenamide, which is thought to have a lower, yet reported risk of diarrhea (Food and Drug Administration, 2020a; Food and Drug Administration, 2020b). Therefore, it is not clear whether long-term use of integrase strand transfer inhibitor with emtricitabine and tenofovir carries a risk of inducing diarrhea in PLWH.

Consequently, possible questions remain regarding whether diarrhea continues to affect PLWH, even though there is a paucity of discussion of the condition in the recently published literature. Perhaps, clinicians are less likely to include diarrhea in their history taking because it has become a less frequently occurring condition. However, it has been suggested that individuals may be embarrassed or reluctant to report or discuss the symptomatology with their provider (Doughty, 2005). These same individuals may consider diarrhea as a normal variant that must be tolerated or accepted as part of living with HIV or taking medications. Further, confusing the scope of understanding and challenging the health literacy of PLWH is that there are multiple definitions of what constitutes diarrhea, which makes ascertaining the presence and severity of the condition challenging at best (Division of AIDS, 2017; Center for Disease Control and Prevention, 2017; Siddiqui et al., 2007; Tinmouth et al., 2007).

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Regardless of the definition of diarrhea, it still requires the patient to report their bowel habits to their provider. Today's most current literature addressing HIV-related diarrhea is by Tinmouth et al., (2007) who systematically reviewed 384 articles that met their criteria for HIV-related diarrhea. The authors suggested that of those studies reviewed, the investigators relied on non-validated and disparate measures of HIV-related diarrhea. The presence of diarrhea was most often defined by duration (33 trials, 72%), stool frequency (29 trials, 63%), and/or stool form (23 trials, 50%); often, more than one parameter was used. These authors recommended the use of an easy-to-use, well-accepted, and valid tool to measure HIV-related diarrhea. A commonly used tool is the Bristol Stool Form Scale, developed by Blake et al. (2016), which uses a pictorial display to accurately assess diarrhea. Finally, PLWH may be self-medicating with over-the-counter medications to control the diarrhea and not consider themselves to have diarrhea or meet their personal definitions of it. In general, whether accepting or not, diarrhea is not normal and may interfere with quality of life (Zhao et al., 2012).

Given that the level of diarrhea in PLWH has not been recently reported in the literature, the objective of this study was to examine the patient characteristics and current levels of diarrhea reported among PLWH. The study also aimed to determine patients' definitions of diarrhea, description of bowel movements using a visual scale (Bristol Stool Form Scale), comfort in discussing diarrhea with a health care provider, and when they thought they should discuss diarrhea with a provider. The frequency of having diarrhea and the use of self-medication to control diarrhea was also assessed.

## Methods

We conducted a cross-sectional study from June to October 2019 regarding patient perspectives about diarrhea, using a convenience sampling approach. Participants were recruited from clinics served by faculty from the McGovern Medical School at The University of Texas Health Science Center at Houston and offered an opportunity to participate in the study during routine, scheduled clinic visits. Inclusion criteria required participants to be 18 years of age or older, living with HIV, and independently able to read and complete the questionnaire focusing on their personal diarrhea perspectives. There were no exclusion criteria.

All participants meeting inclusion criteria were approached and offered an opportunity to participate during the data collection period. Each clinic patient was

privately provided a letter of information regarding the study once they were escorted to their private examination room during their routine clinic visit. Completion of the questionnaire indicated consent. No patients declined participation. All questionnaires were reviewed for completion before the participant left the room. This study was reviewed and approved by the institutional review board at the University of Texas Health Science Center at Houston (IRB # HSC-MS-18-0490). Completion of the questionnaire was voluntary, and no records were kept identifying completers and noncompleters to avoid any sense of coercion.

The questionnaire was designed to collect demographic information, how the PLWH defined diarrhea, and related issues. The individuals were asked to describe their stools using the Bristol Stool Form Scale, a well validated instrument for use in the general public, that uses a chart with pictures allowing individuals to describe their stools (Blake et al., 2016). The pictorial scale ranges from 1 to 7 and classifies stool from "separate hard lumps" to "liquid consistency with no solid pieces." The study questionnaire was developed by the authors and content experts incorporating the use of the Bristol Stool Form Scale. The study questionnaire was pilot tested with 25 initial individuals who were not included in the final study for feasibility of administration, clarity, and readability based on feedback.

Study participants were categorized into three groups based on Bristol Stool Form Scale: Group 1: Bristol Stool Form Scale 1–3 (separate hard lumps to sausage shaped with cracks on surface), Group 2: Bristol Stool Form Scale 4–5 (sausage or snake-like, smooth and soft, to soft blobs with clear-cut edges that are easy to pass), and Group 3: Bristol Stool Form Scale 6–7 (fluffy pieces with ragged edges and mushy to watery with no solid pieces—essentially liquid). We defined Group 1 as near constipation, Group 2 as normal bowel movements, and Group 3 as having diarrhea.

Descriptive statistics were performed to include the calculation of frequency. Demographic differences and responses to the stool questions were stratified according to three patient groups and examined using chi-square test or Fisher exact test for categorical variables. A *p* value less than .05 was considered statistically significant. All statistical analyses were conducted using SAS 9.4.

## Results

Completed questionnaires were received from 190 of the clinic's patients. Table 1 presents the demographic characteristics. Among PLWH, 61.1% reported as male,

**Table 1. Characteristics of 190 PLWH by Description of Their Stools Based on the Bristol Stool Form Scale (Blake et al., 2016)**

PLWH Characteristics	Total (n = 190)	%	Bristol Stool Scale 1–3 (n = 30)	%	Bristol Stool Scale 4–5 (n = 138)	%	Bristol Stool Scale 6–7 (n = 22)	%	p-Value
Age (years)									.083
18–24	4	2.1	2	6.7	2	1.4	0	0	
25–35	39	20.5	4	13.3	29	21.0	6	27.3	
36–49	63	33.2	14	46.7	42	30.4	7	31.8	
50–64	70	36.8	10	33.3	55	39.9	5	22.7	
65+	14	7.4	0	0	10	7.2	4	18.2	
Gender									.031
Female	41	21.6	9	30.0	27	19.6	5	22.7	
Male	116	61.1	13	43.3	86	62.3	17	77.3	
Transgender	33	17.4	8	26.7	25	18.1	0	0	
Race/ethnicity									.229
African American	121	63.7	19	63.3	93	67.4	9	40.9	
Caucasian	28	14.7	4	13.3	18	13.0	6	27.3	
Hispanic	34	17.9	5	16.7	23	16.7	6	27.3	
Asian	2	1.1	1	3.3	1	0.7	0	0	
Other	5	2.6	1	3.3	3	2.2	1	4.5	
Education									.862
Less than high school	30	15.8	6	20.0	20	14.5	4	18.2	
High school graduate	37	19.5	6	20.0	28	20.3	3	13.6	
Beyond high school	115	64.7	18	60.0	90	65.2	15	68.2	
Years living with HIV									.420
<1 year	8	4.2	3	4.2	5	0	0	0	
1–5 years	43	22.6	5	22.6	34	18.2	4	18.2	
6–9 years	24	12.6	4	12.6	15	22.7	5	22.7	
10+ years	115	60.5	18	60.5	84	59.1	13	59.1	

Note. PLWH, persons living with HIV. Blake, M., Raker, J., & Whelan, K. (2016). Validity and reliability of the Bristol Stool Form Scale in healthy adults and patients with diarrhea-predominant irritable bowel syndrome. *Alimentary Pharmacology & Therapeutics*, 44(7), 693-703. <https://doi.org/10.1111/apt.13746>. Adaptations are themselves works protected by copyright. So in order to publish this adaptation, authorization must be obtained both from the owner of the copyright in the original work and from the owner of copyright in the translation or adaptation.

21.6% as female, and 17.4% as transgender. The majority of the participants were 50–64 years in age (36.8%), whereas 33.2% were 36–49 years old. They

were more likely to identify as Black (63.7%) or Hispanic (17.9%) than White (14.7%). Most participants had education beyond high school (64.7%). This was

also a very HIV experienced group by years of infection, with 60.5% of the participants having been living with HIV for 10 or more years. None of the demographic groups were significantly different with regard to the three Bristol Stool Form Scale groups, except patient's gender. The proportion of male patients was highest in Group 3 (diarrhea group;  $p = .031$ ).

Most participants (70%) said that they rarely had diarrhea. Another 15.3% said that they had it monthly. Only 5.3% reported they had diarrhea daily, and 9.5% said that it occurred weekly. Using the Bristol Stool Form Scale, 30 individuals (15.8%) described their stools at the low end of the scale (Group 1: Bristol Stool Form Scale 1–3). The majority ( $n = 138$ , 72.6%) reported in the middle of the scale (Group 2: Bristol Stool Form Scale 4–5). Only 22 participants (11.6%) were on the diarrhea end of the scale (Group 3: Bristol Stool Form Scale 6–7).

Table 2 presents the results of the responses given by the PLWH when they were provided with five possible terms to describe diarrhea (watery, unformed, soft, oily, or mucoid). The participants were asked to choose one or multiple terms which they characteristically considered diarrhea. Overall, the participants chose watery ( $n = 101$ , 53.2%), soft ( $n = 21$ , 11.1%), unformed ( $n = 5$ , 2.6%), mucoid ( $n = 1$ , 0.5%), and oily ( $n = 1$ , 0.5%) as single descriptors. An additional 55 patients chose watery in combination with other descriptors, whereas soft was selected with other descriptors 29 times (including 28 times with watery). Only 12 PLWH did not include watery or soft in their definition of diarrhea. However, no significant difference was found among the three Bristol Stool Form Scale groups.

The participants were also asked “Thinking about frequency, how many times do you need to have a bowel movement for you to consider it diarrhea?” Overall, 6.8% chose a few times per week, 20.5% chose daily, 38.4% selected two to three times per day, 28.9% chose four to six times per day, and 5.3% selected seven or more times per day. However, no significant difference was found among the three Bristol Stool Form Scale groups and their self-reported perception of stool frequency associated with diarrhea.

With regard to comfort in talking about diarrhea with a health care provider, the vast majority (87.9%) said that they were not bothered, 7.9% said they were bothered a little, 3.2% said it bothered them, and only 1.1% said that it bothered them a lot. The participants were also asked how often they would have to “poop” before it was concerning enough to tell a provider. Overall, 21.6% said that it would have to be more than seven times in a day, 42.6% said four to six times per day, 23.7% said two to three times per day, 6.3% said once per day, and 5.8% thought a

**Table 2. One Hundred Ninety Persons Living With HIV Descriptions of Diarrhea When Given the Choices of Unformed, Watery, Oily, Mucoid, and/or Soft**

Descriptor	Number of Patients	Percent of Patients
Watery	101	53.2
Watery, soft	12	6.3
Watery, oily	4	2.1
Watery, unformed	16	8.4
Watery, unformed, oily	4	2.1
Watery, oily, soft	1	0.5
Watery, mucoid, soft	3	1.6
Watery, unformed, mucoid	1	0.5
Watery, unformed, soft	6	3.2
Watery, oily, mucoid	2	1.1
Watery, unformed, oily, soft	1	0.5
Watery, unformed, mucoid, soft	1	0.5
Watery, unformed, mucoid, soft, oily	4	2.1
Soft	21	11.1
Unformed, soft	1	0.5
Unformed	5	2.6
Oily	1	0.5
Mucoid	1	0.5
Oily, mucoid	1	0.5
Other	4	2.1

few times per week. Similarly, no significant difference was found among the three Bristol Stool Form Scale groups for these questions. The participants were also asked whether they used antidiarrheal medications, and 57.9% said that they never used these medications, 22% said that they used them some of the time, 6.8% replied most of the time, and 13.2% said all of the time. Even among Group 3, antidiarrheal drugs were not commonly taken on a regular basis in more than 70% of these individuals.

## Discussion

In this cross-sectional study, our results indicate that among PLWH, the presence of diarrhea was relatively

infrequent (11.6%) compared with studies that reported as high as 60% in the PI era of antiretroviral treatment (Sherman & Fish, 2000). Our finding of infrequent diarrhea was a result of the question that asked participants how often they had diarrhea. Only 14.8% said they experienced what they considered the symptom of diarrhea daily or weekly, whereas 70% said that they seldom had diarrhea. Our study indicated diarrhea is a far less prevalent symptom among PLWH than it was reported in the past. However, with a weekly prevalence rate of nearly 15%, it is of a sufficient level to specifically include in a review of symptoms. The data also support asking about the nature of bowel movements using the words “watery and soft” in the questioning because these terms are the most likely to be understood.

The importance of asking about patients’ definition of diarrhea is reinforced by the fact that 21.6% of patients said that diarrhea would have to occur more than seven times per day and an additional 42.6% would have to have it four to six times per day before they would bring it up to a health care provider. Part of a routine review of symptoms would include questioning at each visit regarding a patient’s bowel habits. Simply asking whether there have been any changes in bowel habits is not enough. Nurses have a unique opportunity of asking a patient specifically about their daily bowel habits, which include frequency. Further, the finding that 60% of the participants said that having diarrhea did not bother them or only bothered them a little suggests that PLWH might not proactively inform their provider of having diarrhea. Thus, there may be a missed opportunity to adjust the treatment plan or further investigate triggers—whether dietary, medication, or something else—reinforcing the need for the provider to proactively inquire rather than wait for the patient to raise the issue. In terms of self-medication to control diarrhea, among patients in Group 3 (diarrhea group), more than 70% reported that they “never” or “some of the time” took over-the-counter medications to treat themselves. Self-medication does not seem to be a concerning factor in masking the condition.

The strength of this study is that it investigated a condition of long-standing concern for those providers treating PLWH, which has not been examined as the care of these individuals has evolved over the last several years. The study included men, women, and transgender persons. The study population also contained participants from the recently diagnosed to highly experienced PLWH. An attempt was made to discover a collective definition of diarrhea in general

for PLWH and their personal definition of their own bowel movements rather than relying on clinical definitions of diarrhea. Nursing practice could well support patient involvement, encouraging reporting of diarrheal symptoms as well as simply assessing stool patterns by providing a visual analog scale like the validated Bristol Stool Form Scale during the visit encounter.

We acknowledge the limitations of the study. Our study design was cross-sectional and used a convenience sample from one geographic region (Houston, Texas), limited to those fluent in English, included a sample where a significant majority were highly educated, and had no difficulty reading. Thus, generalizability of the results is limited. In addition, our participants were highly experienced with HIV, with more than 60% having been living with HIV for more than 9 years. Many of these participants living with HIV for a longer period would likely have been treated in the PI era, giving them a tolerance for and acceptance of diarrhea over that of those recently living with HIV. We did not include current laboratory values or current combination antiretroviral therapy regimens because the study was strictly attempting to determine participant definitions, frequency, and concern of diarrhea as a symptom. Thus, future studies examining laboratory values, combination antiretroviral therapy regimen, and newly or more recently infected patients are needed.

In conclusion, our findings suggest that diarrhea remains a symptom experienced by some PLWH. Most patients were not bothered by the diarrhea and were comfortable in discussing diarrhea with their health care providers. Our findings suggest that health care providers of PLWH should proactively inquire about patients’ bowel habit status, which may further reduce the prevalence of the symptom.

## Disclosures

Robin L. Hardwicke reported receiving lecture fees from Gilead Pharmaceutical Company and Thera Pharmaceutical Company, although no real or vested interests related to this article could be construed as a conflict of interest. The other authors reported no financial interests or potential conflicts of interest.

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## Key Considerations

- Diarrhea in PLWH continues to exist.
- Diarrhea in PLWH can be multifactorial.
- There is not a universal descriptor or definition for diarrhea.
- Using terms the patient understands and can identify with such as “watery and soft” is ideal.
- All PLWH deserve to be interrogated at each visit regarding bowel habits, which can be easily performed by any health care provider, but nurses have a unique and first opportunity for assessment.

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