

## ORIGINAL PAPER

### Stool Specimen Collection: Nurses' and Patients' Perspectives

**Fatma Ilknur Cinar, RN, PhD**

Lecturer of Medical Nursing, Gulhane Military Medical Academy, School of Nursing, Ankara, Turkey

**Fatma Yilmaz, RN**

Gulhane Military Medical Academy, School of Medicine, Division of Haematology, Ankara, Turkey

**Memnun Seven, RN, PhD**

Assist Professor, Koç University, School of Nursing, Istanbul, Turkey

**Muhammet Cinar, MD**

Rheumatologist, Gulhane Military Medical Academy, School of Medicine, Division of Rheumatology, Ankara, Turkey

**Ramazan Gumral, MD**

Assist. Professor, Gulhane Military Medical Academy, School of Medicine, Department of Microbiology, Ankara, Turkey

**Correspondence:** Fatma Ilknur Cinar, GATA Hemşirelik Yüksek Okulu, 06010, Etlik/Ankara/Türkiye E-mail: icinar@gata.edu.tr, filknur@yahoo.com

#### Abstract

**Aim:** The aim of the study was to assess the difficulties that nurses are confronted with during the procedure of taking stool specimens, and the difficulties that patients experienced during giving stool specimens and their solutions.

**Background:** Specimen collection is often the first crucial step in determining diagnosis and treatment methods. Appropriate specimen collection, transport, and processing are important to diagnose infectious diseases accurately.

**Methods:** This descriptive/cross-sectional study included 173 nurses and 108 patients. To collect data, questionnaires developed by the authors were used.

**Results:** Of the nurses, 24.3% stated that they have difficulty in explaining to patients the method for taking stool specimens. Of the patients, 66.7% expressed that they had difficulties in obtaining their own stool specimens. The main complaints of the patients were "not being able to determine the quantity of the stool to be given". Of the problematic patients, 16.7% expressed that they found no solution to their problems.

**Conclusion:** Nurses should give patients information regarding an appropriate and applicable method of giving a specimen, and patients should be evaluated as to whether they need explanation on it.

**Keywords:** Stool Specimen, Collection, Patient Education, Nursing

#### Introduction

Specimen collection is often the first crucial step in determining diagnosis and treatment methods (Higgins, 2008). Blood, urine, stool, and sputum are some of the most common collected specimens (Lynn, 2011). Stool specimens are generally examined for the diagnosis of gastrointestinal (GI) bleeding, GI obstruction, obstructive jaundice, parasitic diseases,

dysentery, ulcerative colitis, and increased fat excretion (Higgins, 2008; Lynn, 2011; Fischbach & Dunning, 2009; Kaya, 2012). Stool examination is a preferred laboratory methods in the diagnosis of these diseases when compared to more expensive, time-consuming and invasive diagnostic tests (Jessee, 2010).

Appropriate specimen collection, transport, and processing are important to diagnose infectious

diseases accurately (McPherson & Pincus 2011). Specimen collection is a procedure that requires collaboration between nurse and patient. The nurse is responsible for ensuring correct way of obtaining, labelling, and sending a stool specimen to laboratory in a timely manner (Lynn, 2011; Jessee, 2010). Specimen collection and timely transport are very important for obtaining correct test results (Jessee, 2010; Dacombe et al., 2007). Common problems nurses confront with are related to choosing a way of giving specimen, the appropriate amount of specimen, and placing the stool specimen in the container (Lynn, 2011). The nurses may experience difficulty in taking the specimen from the patient, just as the patient does in giving the specimen. The methods used by patients to take stool specimens are as follows: the patient may defecate on toilet paper, on the side of the squat toilet, on a piece of paper or in a bedpan, and then use the spoon of the container, a tongue blade, or a paper napkin to transfer the stool into the specimen container, or he/she may defecate directly into the specimen container (Lynn, 2011; Fischbach & Dunning, 2009; Stockley, 2002). The problems faced by health staff in the procedure arise from patients disliking or refusing to receive information because they feel uncomfortable and/or embarrassed (Jessee, 2010; Dacombe et al., 2007). First, the nurse should evaluate whether or not the patient needs explanation about the procedure, and then an appropriate and applicable method of specimen taking should be suggested. The nurse plays the main role of informing the patients prior to taking specimens (Lynn, 2011; Jessee, 2010; Potter et al., 2013). Determining the difficulties encountered during the procedure of collecting stool specimens will contribute to create awareness on these problems.

The purpose of this study was: 1) to determine the content of information given by nurses to patients who are asked to give stool specimens, and to assess the difficulties nurses experienced during this procedure, and 2) to determine the difficulties that patients experienced during giving stool specimens and the solutions they found to deal with these difficulties.

## Methods

### *Study design and Participants*

This study was designed as descriptive and cross-sectional research. The study was conducted in a

state hospital in Turkey between 2011 and 2012. The study included 173 clinical nurses and 108 patients who gave stool specimens for various reasons to the microbiology and biochemistry laboratories of the hospital. The patients including in the study were 18 years of age, and could understand and speak Turkish.

### *Instruments and Procedure*

Separate data collection forms for nurses and patients, developed by the investigators were used to collect data. *The Nurse Data Collection Form* comprised questions on demographic features of the nurses such as age and education, and questions about their instructions on how patients should take and give stool specimens, the content of the information they give to patients, and the difficulties they encounter during the procedure.

*The Patient Data Collection Form* comprised questions on the demographic features of patients such as age, gender, and education, and closed/open end questions on the patient's knowledge of how stool specimen is to be taken, nurse's explanation to the patient on how stool specimen has to be taken, how the patient gave the specimen, difficulties experienced during the procedure of specimen taking, and suggestions for the solution of these difficulties. The study was started following the approval of the institutional review board of the hospital. The participants also provided verbal and written consent after the aim and method of the study had been explained in the study. Filling out the questionnaires took approximately 10-15 minutes.

The SPSS 15.0 (Statistical Package of Social Sciences Inc. Chicago, IL, USA) package program was used to analyze the data. Descriptive statistics were used in the form of mean±standard deviation and frequency.

## Results

All nurses participating in the study were females with a mean age of 32.95±5.43. Of the nurses, 50.3% worked in medical clinics and 49.7% in surgical clinics of the hospital, and 88.4% were university graduates who had completed a 4-year nursing program. Of the patients, 59.3% were males with a mean age of 35.03±1.38. Among the patients, 49.1% were university graduates and 27.8% were high-school graduates.

**Table 1: Nurses' approach to patients for taking stool specimens**

	n	%
Nurse giving initial detailed explanation to the patient on how stool specimen has to be taken		
Yes	154	89.0
No	19	11.0
The items that the nurse explained in detail to the patient before taking stool specimen (n=154) *		
Purpose of the stool test	60	34.7
Amount of stool to be taken	57	32.9
Method of taking stool specimen	57	32.9
Appropriate answers to the patient's questions	43	24.9
From where the test results should be obtained	4	2.3
The time the stool specimen is sent to the laboratory; in:		
0-30 minutes	123	71.1
30 minutes-1 hour	17	9.8
>1 hour	33	19.1
Storage of the stool specimen until it is sent to the laboratory		
Refrigerator	7	4.0
Room temperature	49	28.3
Missing variable	117	67.6

\* Participants marked more than one item.

**Table 2: The difficulties nurses experienced when taking stool specimens from hospitalized patients n=42\***

	n (%)	Some examples of the nurses' statements
Patient not understanding the word "stool"	12 (28.6)	<ul style="list-style-type: none"> <li>• Generally patients do not understand the word "stool". I have to explain it as "big toilet".</li> </ul>
Not being sure about the amount of stool specimen required from the patient	9 (21.5)	<ul style="list-style-type: none"> <li>• In itself, it is a difficult subject. The patient needs to use a squat toilet to take the stool specimen. Moreover, adjusting the amount of stool to be collected is a difficult subject.</li> </ul>
Patient expressing his/her difficulty in the use of the toilet type (for example, difficulty in using the sitting type of toilet)	8 (19.0)	<ul style="list-style-type: none"> <li>• The use of a closet makes specimen collection harder. In fact, patients have a hard time in every way.</li> <li>• Since there is no easy way to collect the specimen, I cannot tell the patients definitely where they should defecate for collecting stool specimens.</li> </ul>
Patient complaining of the small size of the specimen container	7 (16.6)	<ul style="list-style-type: none"> <li>• The containers are too small.</li> </ul>
Patient feeling ashamed and not listening to the explanation given by the nurse	6 (14.3)	<ul style="list-style-type: none"> <li>• I try to explain in detail, but patients feel ashamed, so they do not listen to me.</li> </ul>

\*The number of the nurses who stated that they have difficulty in ordering stool specimens from patients

**Table 3. The patients' experience in giving stool specimens**

	n	%
Patient's knowledge on the meaning of the word "stool"		
Knowing	97	89.9
Not knowing	11	10.1
Patient's knowledge on how stool specimens are to be collected		
Knowing	75	69.4
Not knowing	33	30.6
Informing the patient before collecting stool specimen		
Yes	63	58.3
No	45	41.7
Persons informing the patient before collecting stool specimen (n=63)		
Nurse	50	79.4
Doctor	8	12.7
Family members/Friend	5	7.9
Patient's method of collecting stool specimen (n=39)		
Defecating onto a lateral site of the toilet and then putting stool in the container with a spoon	17	43.6
Trying to defecate directly into the specimen container	16	41.0
Defecating on a paper napkin and then putting it into the container with a spoon	4	10.3
Trying to collect the specimen directly with a spoon while defecating	2	5.1

**Table 4: The difficulties patients experienced during taking stool specimens**

	n	%
<i>Experiencing difficulty</i>		
Yes	72	66.7
No	36	33.3
<i>Experienced difficulties (n=72) *</i>		
Not being sure about the amount of stool to be given	27	25.0
Difficulty in putting stool specimen in the container	27	25.0
Difficulty in defecating directly into the container	26	24.1
Difficulty in using the sitting type of toilet	21	19.4
Difficulty in using squat toilet	9	8.3
Not knowing where and how to defecate	6	5.6
Difficulty in using the spoon of the container	6	5.6
Difficulty in collecting the stool specimen with a spoon while defecating	4	3.7
<i>Patients' solutions to difficulties related to the procedure of collecting stool specimens (n=72)</i>		
To defecate directly into the container	18	25.0
To defecate on a lateral site of the toilet and then transfer the stool specimen into the container	14	19.4
Finding no solution	12	16.7
To transfer the stool specimen with toilet paper/napkin into the container	9	12.5
To ask the nurse how the specimen should be taken	6	8.3
To defecate in a pan and then transfer the stool specimen with a spoon into the container	5	6.9
To ask patients/friends who have given stool specimens before	4	5.6
To defecate into a nylon bag and then transfer the stool specimen into the container	4	5.6

\* Participants marked more than one item.

Some nurses stated that they briefly explain the method of collecting stool specimen to patients while others give more detailed information (89.0%) (Table 1). Relevant statements by the nurses in the questionnaire were as follows: "After I give the stool container to the patient, I say, in a way that the patient will understand, 'We want a sample from your stool.'", "I say, 'Put some of your stool in the container with the spoon of the container.'", "I tell the patient to put some of the clean part of the stool using a tongue blade into the container or to defecate directly into the container", and "I tell the patient to defecate on a newspaper and then transfer the stool with a spoon into the container". Some of the nurses give more detailed information to the patients as in the following responses: "I tell the patient to first put the stool into a disposable glass or container and then transfer a little amount of the stool to the stool container" or "I tell the patient to defecate somewhat on the lateral site of the toilet, and then put about a spoonful of stool into the container" (not shown).

Of the nurses, 24.3% stated that they encountered difficulties while taking stool specimens. The most frequently confronted difficulties were that "the patient did not know the meaning of the word 'stool'" (28.6%) and "the nurse was not sure about the amount of stool to be taken from the patient" (21.5%). The difficulties experienced and the relevant statements from the nurses are given in Table 2.

The patients' experiences in giving stool specimens are presented in Table 3. According patients' statements, 58.3% were informed before giving stool specimen, 10.1% did not know the meaning of the word "stool", and 30.6% did not know how to collect stool specimens (Table 3).

Of the patients, 66.7% stated that they had difficulty in the procedure of giving a stool specimen. The main difficulties patients encountered were "not being sure about the amount of stool to be given as a specimen" (25%) and "difficulty in transferring the stool specimen into the container" (25%). The most frequent solutions the patients found to their problems were "to defecate directly into the container" (25%), and "to defecate onto the lateral site of the toilet and then transfer the stool specimen into

the container" (19.4%). However, 16.7% of the patients stated that they could find no solution for the problems they had.

## Discussion

The results of our study showed that both nurses and patients experience different difficulties during the procedure of collecting stool specimens. Disagreements between nurses can exist about how they should collect a stool specimen, the amount and storage of the specimen, and how they should inform the patient before taking the specimen. Likewise, patients experience difficulty about how to take stool specimens and what amount to give, and they try to find personal solutions to these problems. Moreover, some of the solutions applied by patients may lead to incorrect laboratory results, and some cause more trouble in the procedure of taking stool specimen. Obtaining correct test results is possible only when the stool specimen is taken under appropriate conditions (Jessee, 2010; McPherson & Pincus 2011). Otherwise, specimens improperly taken and not sent in a timely manner may cause complications in therapy as well as loss of energy, time and money. Dacombe et al. (2007) studied the effect of transport time on fecal specimens being examined for helminths, and found that even a brief delay on transport time affected the diagnostic results of multiple helminth infections.

In our study, most nurses stated that they informed the patients sufficiently before taking stool specimens. The information given was mostly about the purpose of the test, the amount of stool to be taken, and how the patient should have the specimen. According to literature, the stool specimen should not have contact with substances such as soap, detergents, or disinfectants, with urine (Fischbach & Dunning, 2009; Potter et al., 2013; Johns Hopkins Medical Microbiology, 2012) or, because of barium content, with paper napkins/toilet paper (Fischbach & Dunning, 2009; Stockley, 2002). But, in our study, none of the nurses mentioned this subject. In our study, most of the nurses stated that they sent the stool specimens to the laboratory in the first 30 minutes, and kept the specimens generally at room temperature. According to the literature, the stool specimen

should be sent to the laboratory immediately or within two hours, if kept at room temperature (Fischbach & Dunning, 2009; Stockley, 2002; Johns Hopkins Medical Microbiology, 2012). If the specimen cannot be transferred to the laboratory immediately, it should be kept in a refrigerator until the time of transfer, except for in the examination for parasites and parasite eggs which can be seen best in fresh feces. Some medical centers use specimen containers containing preservatives for detection of parasites and parasite eggs (Higgins, 2008; Rosdahl & Kowalski, 2008; Lynn, 2011). Nevertheless, in our study, none of the nurses stated that the storage conditions of the stool specimen changed according to the type of examination to be made. Also, most of the nurses gave no reply to the question related to this subject.

Of the nurses, 24.3% stated that they experienced difficulty when taking stool specimens from patients. The most frequent difficulty was that patients did not know the meaning of the word "stool". In Turkish, the synonym for "stool" is "big toilet," and we think that this expression is better understood by patients. This situation indicates the importance of informing the patients by using the language at their educational level. In our study, both the patients and the nurses complained of not being sure about the amount of stool to be given for a specimen. Jesse (2010) wrote that in order to decide on the amount of stool specimen, the nurse should know the stool test procedure well, and, in so, inform the patient accordingly about the amount of specimen. If the nurse does not know what amount of stool specimen is needed for the test, she should learn from the laboratory and inform the patient (Rosdahl & Kowalski, 2008; Lynn, 2011). In our study, one of the difficulties stated by the nurses was that patients felt ashamed, so they didn't listen to the information given. Most GI tests are intrusive, and are annoying and embarrassing subjects that are hard for patients to speak about (Basavanhappa, 2003; Jesse, 2010). Both patients and health staff might not like taking and examining stool specimens (Basavanhappa, 2003; Higgins, 2008; Fischbach & Dunning, 2009), but since the examination of stool contributes significantly to the diagnosis of GI diseases such as pancreas and liver disorders, the procedure for taking stool specimens should be carried out with utmost care (Fischbach &

Dunning, 2009). The nurse, being aware of the importance of taking stool specimens properly, should inform the patient on the procedure, taking care to protect the self-respect of the patient.

In our study, some of the patients (30.6%) stated that they did not know how to take a stool specimen. More than half of the patients expressed that they received guiding information prior to specimen taking, mostly from nurses. The responsibilities of the nurse in charge of the test are to provide the patient comfort and to assist the patient before, during, and after the test (Basavanhappa, 2003; Daniels, 2009). During the procedure, the nurse should meet the educative as well as the psychological needs of the patient (Basavanhappa, 2003). The collection, labelling, and timely transfer of the specimen to the laboratory are among the responsibilities of the nurse (Jessee, 2010; Lynn, 2011). The nurse should have the knowledge and skills to inform the patient on how he/she can take a stool specimen in the most comfortable and easiest way. Moreover, during the procedure, the nurse should be able to use her scientific knowledge from many fields such as biology, microbiology, epidemiology, and psychology (Daniels, 2009). By using her scientific knowledge, prior to specimen taking, the nurse should inform the patient of the test to be made, reason for having the test, amount of stool required for the test, easiest way of taking the specimen, probable results of the test, and from where the test results will be taken.

In our study, more than half of the patients stated encountering difficulty in taking a stool specimen. The most frequently experienced difficulties by the patients were "not being sure about the amount of stool to be given, difficulty in transferring the stool into the specimen container, and difficulty in defecating directly into the specimen container". There is no data in literature on the convenience of defecating directly into the specimen container. Except in cases of diarrhea, the stool specimen should be taken from the bloody and mucous-containing sites and from three different parts of stool (Rosdahl & Kowalski, 2008). For correct test results, the specimen should reflect the whole content of the stool (Fischbach & Dunning, 2009). Moreover, for the diagnosis of parasitic diseases, stool specimens should be taken from



the patient 3 times in intervals of a few days. In our study, it was found that the patients gave stool specimens using different methods. The most frequently applied methods were “defecating directly into the specimen container”, “defecating on a lateral site of the toilet and then transferring the specimen into the specimen container”, and “transferring the specimen into the specimen container using toilet paper/paper napkin”. It is suggested that the stool specimen can also be taken by defecating on stretch paper on a bedpan or seat of the toilet and then transferring the specimen into a clean and dry specimen container (Johns Hopkins Medical Microbiology, 2012). It is reported that “defecating on a lateral site of the toilet and then putting the specimen into the container” is a favorable method for specimen taking as long as the stool is not contaminated with paper napkins, piece of paper, urine or water (Lynn, 2011). This method is reported to be eligible for adults and older children (Stockley, 2002), but it is not clear whether or not the patients using this method have contaminated their specimens with substances like water, urine or toilet paper, which can affect test results (Stockley, 2002; Fischbach & Dunning, 2009). In view of these reports, nurses should know patients’ methods of solution, determine the mistakes made, and give correct information to patients prior to specimen taking. Of the patients experiencing difficulty, 16.7% stated that they could find no solution to their problems. These patients should never be ignored and should receive the information and guidance that they need.

### Conclusion

In conclusion, the results of this study showed that in the procedure of taking stool specimens, nurses as well as patients experience difficulties. The most frequent difficulty for nurses was that patients did not know the meaning of the word “stool”. More than half of the patients stated to have difficulty in determining the amount of stool to be given, as well as in transferring the stool into the stool container. The patient should be evaluated as to whether or not he/she needs an explanation of the procedure, and then an appropriate and applicable method of specimen taking should be suggested by the nurse, who should play an educative and guiding role in the procedure.

### Acknowledgement

We would like to thank all of the people who participated in this study.

### References

- Basavanthappa, B.T. (2003) Medical Surgical Nursing. Jaypee Brothers Medical Publishers.
- Dacombe, R. J., Crampin, A. C., Floyd, S., Randall, A., Ndhlovu, R., Bickle, Q., Fine, P.E. (2007) Time delays between patient and laboratory selectively affect accuracy of helminth diagnosis. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 101, 140-145.
- Daniels, R. (2009) *Delmar’s Guide to Laboratory and Diagnostic Tests*. Cengage Learning.
- Fischbach, F., Dunning, M.B. (2009) *A Manual of Laboratory and Diagnostic Tests*. Wolters Kluwer Health / Lippincott Williams & Wilkins.
- Harrison, T.M., Stewart, S., Ball, K. & Bratt, M.M. (2007) Clinical Focus Program: enhancing the transition of senior nursing students to independent practice. *Journal of Nursing Administration* 37 (6), 311-317.
- Higgins, D. (2008) Specimen collection. Part 3--collecting a stool specimen. *Nursing Times* 104, 22-23.
- Jessee, M.A. (2010) Stool studies: tried, true, and new. *Critical Care Nursing Clinics of North America* 22, 129-145.
- Johns Hopkins Medical Microbiology Specimen Collection Guidelines – Updated / 2012. Available from URL:<http://www.hopkinsmedicine.org/microbiology/specimen/Specimen%20Collection%202012.pdf>
- Kaya, H. (2012) Bowel Elimination. In: Aşti TA, Karadağ A. (eds). *Fundamentals of Nursing*. Akademi Basın ve Yayıncılık, 942-969.
- McPherson, R.A., Pincus, M.R. (2011) Specimen Collection and Handling for Diagnosis of Infectious Diseases, *Henry’s Clinical Diagnosis and Management by Laboratory Methods*, Twenty-Second Edition, Chapter 63, 1239-1252.e1.
- Lynn, P. (2011) *Taylor’s Handbook of Clinical Nursing Skills*. Wolters Kluwer Health/ Lippincott Williams & Wilkins.
- Potter, P.A., Perry, A.G., Stockert, P., Hall, A. (2013) *Fundamentals of Nursing*. Elsevier Mosby.
- Rosdahl, C.B., Kowalski, M.T. (2008) *Textbook of Basic Nursing*. Wolters Kluwer Health / Lippincott Williams & Wilkins.
- Stockley, M.A. Stool specimen collection, 2002. *Gale Encyclopedia of Nursing and Allied Health*, The Gale Group. Available from URL:<http://www.healthline.com/galecontent/stool-specimen-collection#2>.