

# Are Italian nurses ready for patient blood management program? a national social media survey

Chiara Barchielli<sup>1</sup>, Sara Landriscina<sup>2</sup>, Sabrina Claudia Castelluzzo<sup>3</sup>, Marco Alaimo<sup>3</sup>

<sup>1</sup>Health and Management Laboratory, Institute of Management and EMbeDs, Scuola Superiore Sant'Anna, Pisa, Italy;

<sup>2</sup>Azienda Ospedaliera San Giovanni Addolorata, Rome, Italy; <sup>3</sup>Azienda Usl Toscana Centro, Firenze, Italy

**Abstract.** *Background and aim:* Blood transfusion is one of the five most overused procedures in healthcare. Patient Blood Management (PBM) is a multimodal and multidisciplinary strategy that aims to properly manage the patient blood. In 2015 the Italian National Blood Centre explicitly mentioned the need for the identification of dedicated nursing staff to implement this approach. The purpose of this study is to investigate if Italian nurses are prepared and willing to implement the PBM. *Research design and Methods:* We conducted a social media survey that registered 235 respondents from the whole Italian territory over a one-month period (15<sup>th</sup> of May-15<sup>th</sup> of June 2020). The 23 open and closed-ended questions were intended to investigate the views, the inclinations, and intentions of healthcare professionals towards PBM. *Results:* PBM can still be considered as a niche topic. Therefore, most respondents declared themselves willing to know more about it, to acquire new skills and grow professionally, to determine benefits for the hospital, to improve the quality of nursing care and act evidence based, and to enhance the nursing role in the multidisciplinary team. *Conclusions:* PBM programs are conducted and implemented effectively worldwide, and Italian nurses recognize its importance and are willing to implement it and be a part of it for what then bedside care, the educational, and the managerial role are concerned. ([www.actabiomedica.it](http://www.actabiomedica.it))

**Key words:** Patient blood management, blood transfusion, bloodless nurse, bloodless coordinator, nursing education, nursing management

## Introduction

Blood is a scarce and costly resource (1) both in terms of technologies used and trained personnel involved in the production process. The scarcity depends on the fact that people must meet stringent requirements to become blood donors (2), and because whole blood as well as its derivatives are at the basis of many life-saving therapies and of many studies on how to treat a large number of medical conditions. If we focus on blood transfusion, it can be defined as one of the most frequent therapies, associated with benefits, risks - e.g., allergic, and haemolytic transfusion reactions- (3), and costs (4). This undoubtedly is

complex process involving a perishable scarce resource that needs to be managed, and Patient Blood Management (PBM) qualifies as the most fitting approach to reach an appropriate use of blood and blood components, with the goal to cut back on their use (5). The WHO defines PBM as “a patient-focused, evidence-based and systematic approach to optimize the management of patients and transfusion of blood products for quality and effective patient care, designed to improve patient outcomes through the safe and rational use of blood and blood products and by minimizing unnecessary exposure to blood products...” (6).

If on one hand it describes a conjoint multidisciplinary effort to avoid the situations that may result

in the need of a transfusion with planned pre and post blood loss interventions, e.g., anaemia management, anti-fibrinolytic drugs to reduce bleeding, etc (7), on the other hand it can be seen more as an organizational model to face emergency situations like pandemics. The past two years have been characterized by a critical shortage of every healthcare resource, including the blood supply which is particularly perishable (3). In moments in which demand far outstrips supply, a model that shifts the focus from “reactive transfusion of patients with allogeneic blood components to preventive measures by optimally managing the patient’s own blood” (3) as PBM is strongly advisable, not to mention that extant evidence reports that PBM programs are associated with improved patient outcomes, a reduction in the number of transfusion and a reduction in costs (8, 9). “Bloodless medicine and surgery” are rising approaches (10): while before only surgery was concerned, now medicine is included as well (11, 12). For what concerns Italy, in 2007 the Centro Nazionale Sangue (CNS, or National Blood Centre) is established to: (i) achieve regional and national self-sufficiency in the supply of blood, blood components and blood products; (ii) achieve the highest levels of safety in the blood donation and transfusion process for the effective protection of citizens’ health; (iii) allow the development of transfusion medicine, the appropriate use of the resource “blood” and programmes including methods and tools for the prevention of avoidable transfusion. In 2013, the CNS launched a national project aimed at promoting the first pilot applications of PBM in major elective adult orthopaedic surgery. The therapeutic diagnostic multidisciplinary pathways that originated were gradually extended to other types of surgeries and to medical conditions. Since the beginning of the pilots, it was possible to detect a significant reduction in healthcare expenditure, with a 10-20% reduction in the costs of blood support. In 2015, the “Recommendations for the Implementation of the Patient Blood Management Program” (13), were adopted and in the description of these multimodal and multidisciplinary strategies is reported the necessity of having a dedicated nursing staff (14). Although the PBM culture is spreading within the Italian National Health Service, there is an important knowledge gap regarding the level of knowledge and

acceptance by nursing staff. With the object of understanding more about the PBM knowledge among nurses, we administered a social media survey (SMS) to get a first impression on the dissemination of this approach throughout the national territory. The SMS was chosen because, for the purposes of this preliminary investigation, it was necessary to use a tool that presented the characteristics of agility, celerity, and that did not commit significant economic resources.

## Research design and methods

A 10-item survey was conveyed through Facebook, asking the administrators of five nurse national and local dedicated pages to host it, asking their visitors to fill it in. The survey was online from the 15<sup>th</sup> of May to the 22<sup>nd</sup> of June 2020. No limits were set regarding the operative setting of the participants, age, or gender. Notwithstanding the short time set for participation, a quite large sample of nurses answered (n=235), whose characteristics are resumed in table 1.

Stokes and colleagues (15), informing on how to use social media for survey nurse participant recruitment, report an “organic snowballing effect”, that is the propagation of the invitation to the compilation through “tags” and “shares” from a nurse to other nurses. The use of social media to boost responses from a targeted audience was at the basis of the choice of the administration of the questionnaire for three reasons: 1. it was a free solution 2. it allowed to reach nurses from all over the country in a reduced period and 3. because nurses are difficult to recruit for research (16). The survey was created with the aim to uncover the real extension of the knowledge on PBM and the knowledge of the implications that it has on the nursing practice. The interest in asking directly to professionals was linked to the will of defining their awareness about the importance of their role in a complex and relevant matter as the PBM. The items that form the survey were defined by a focus group in which 6 nurses were invited to participate, with the aim of engineer unambiguous and clear questions on PBM. And following Taherdoost tenets (17), a small pilot sample was used to test the clarity of the questions above the real knowledge on PBM. These are the investigated dimension: (i) the level of familiarity

**Table 1.** Sample characteristics.

| Number of respondents<br>(n= 235)  |       |
|------------------------------------|-------|
| <i>Gender</i>                      |       |
| Women                              | 202   |
| Men                                | 33    |
| <i>Age</i>                         |       |
| Mean age <sup>a</sup>              | 37.08 |
| Median age <sup>a</sup>            | 35    |
| Age range <sup>a</sup>             | 22-63 |
| <i>Seniority</i>                   |       |
| Seniority range <sup>a</sup>       | 0-43  |
| Seniority mean <sup>a</sup>        | 11.79 |
| Seniority median <sup>a</sup>      | 8     |
| <i>Region of employment</i>        |       |
| Northern Regions                   | 64    |
| Central Regions                    | 138   |
| Southern Regions                   | 33    |
| <i>Area of employment</i>          |       |
| Medicine                           | 61    |
| Surgery                            | 32    |
| Mental health                      | 4     |
| Nursing home                       | 11    |
| Maternity & Paediatrics department | 11    |
| Emergency and emergency department | 21    |
| Infectious diseases                | 8     |
| ICU                                | 21    |
| Community care                     | 18    |
| Operating theatre                  | 13    |
| Others                             | 35    |

<sup>a</sup> Unit of measure in years.

of nurses with the PBM, (ii) the level of awareness of nurses on the importance of the role of the nursing profession in PBM, (iii) the consciousness of the need of undergoing a continuous training within the PBM, (iv) the overall importance of PBM, especially in moments of crisis like the pandemic was. The survey investigated the knowledge and opinions of nurses on the PBM with questions from the dichotomous answer yes/no and with questions that provided the possibility of modulating the intensity of their answers through Likert scales from 0 to 10. We wanted to estimate if

**Table 2.** Answers to the dichotomous questions distributed for senior and junior nurses.

|                | <i>Are you familiar with the PBM program?</i>   |     |                     |
|----------------|---|-----|---------------------|
|                | Yes   | No  | I've heard about it |
| <i>Seniors</i> | 20  | 73  | 29                  |
| <i>Juniors</i> | 11  | 78  | 24                  |
|                | <b>In your opinion, are the nurses adequately informed about the importance of their role within the multidisciplinary team of the PBM?</b> |     |                     |
|                | Yes   | No  |                     |
| <i>Seniors</i> | 10  | 112 |                     |
| <i>Juniors</i> | 4   | 109 |                     |
|                | <b>In your opinion, are the nurses adequately informed about the importance of continuing training within the PBM?</b>                      |     |                     |
|                | Yes   | No  |                     |
| <i>Seniors</i> | 15  | 106 |                     |
| <i>Juniors</i> | 10  | 103 |                     |

seniority was a factor that affected the response, and so we divided the sample into “senior” and “junior” respondents by identifying the *discrimen* in the median age, that resulted to be 35 years. The “junior” sample – the respondents under 35 years of age- resulted in the 60,8% of the total sample (141 respondent), while the “senior” sample – the respondent over 35 years of age- resulted in the 39,15% of the total sample (94 respondents). In previous studies, in fact (18), seniority resulted to have a great effect on the expressed opinions and beliefs on important nursing subjects.

## Results

Table 2 shows how dichotomous questions are answered, indicating their respective frequencies. In table 3, frequencies in answers are enriched by the results from senior respondent after the performance of al linear regression, using RStudio software.

## Conclusion

The answers from the sample, indicative for setting of practice, geographical representativeness

**Table 3.** Questions with Likert scale and seniority opinion after linear regression. The first line contains the question addressed, the second line reports Likert scale's values from 0 to 10 and the third line reports the number of respondents. The fourth line reports the seniors' point of view with the indication of t value for each question, which indicates evidence of a difference between population means (juniors-seniors).

|   |                     |   |   |   |   |    |    |    |    |    |    |
|---|---------------------|---|---|---|---|----|----|----|----|----|----|
| <b>Do you think that it is useful to implement the application of the PBM at national level to better manage the blood resource during a period of health emergency as the current one determined by the COVID-19 pandemic?</b> |                     |   |   |   |   |    |    |    |    |    |    |
|   | 0                   | 1 | 2 | 3 | 4 | 5  | 6  | 7  | 8  | 9  | 10 |
|   | 1                   | 1 | 1 | 3 | 6 | 12 | 13 | 33 | 45 | 31 | 86 |
| <b>Seniors</b>  | -0.02 t value -1.73 |   |   |   |   |    |    |    |    |    |    |
| <b>Do you think that knowing PBM through continuous training is useful to improve the role of the nurse towards the patient?</b>  |                     |   |   |   |   |    |    |    |    |    |    |
|   | 0                   | 1 | 2 | 3 | 4 | 5  | 6  | 7  | 8  | 9  | 10 |
|   | 2                   | 0 | 1 | 1 | 3 | 5  | 16 | 34 | 44 | 41 | 85 |
| <b>Seniors</b>  | -0.01 t value -1.7  |   |   |   |   |    |    |    |    |    |    |
| <b>Do you consider useful to encourage healthcare professionals to have a better understanding of the PBM and the training for it?</b>  |                     |   |   |   |   |    |    |    |    |    |    |
|   | 0                   | 1 | 2 | 3 | 4 | 5  | 6  | 7  | 8  | 9  | 10 |
|   | 1                   | 0 | 2 | 0 | 1 | 5  | 8  | 30 | 49 | 46 | 92 |
| <b>Seniors</b>  | -0.02 t value -2.1  |   |   |   |   |    |    |    |    |    |    |

(nurses from 17 Italian regions out of 20) and age, shed light on the knowledge on PBM and its estimated importance from nurses' point of view. Although extant evidence (19) on the wide diffusion and cost effectiveness of PBM, the latter can still be considered as a niche topic in Italy, as most of the respondents declared not to know it or just heard something about it. Therefore, the same majority declares itself not aware of the importance of their role in the multidisciplinary process that characterizes it and not adequately informed about the importance of continuing training within the PBM. The Likert scale questions indicate a growing sentiment towards the importance of the education and continuous training in PBM. The 92,3% (percentage of nurses that indicated a value from 7 to 10 in the Likert scale) of the sample declares that a widespread knowledge of PBM and a training of nurses in it would be useful and the 86,6% of them (this percentage is determined using the same additional estimation) state that a continuous training in PBM would be useful to improve the role of the nurse towards the patient, meaning that the nurse will have another tool to help the patient. The investigation on the relevance of PBM is placed into the pandemic reality, asking respondent if it would be of any use if

applied at national level, to better manage the blood resource. The 83% of responded (this percentage is determined using the same additional estimation) that it would certainly be. When considering seniors' point of view, PBM is certainly considered important for nursing and for patients, it is as if it no longer concerned them directly, as the younger nurses. In fact, linear regressions tell us that the more senior nurses are and the more important they consider PBM training (-0.02; t value -2.1) and consider it important for the patient (-0.01; t value -1.7), but at the same time they do not think it could be important in this moment (-0.02; t value -1.73).

Patient blood management (PBM) describes the application of personalised, evidence-based, care bundles of interventions that reduce bleeding and transfusion intending to improve clinical outcomes (20) along the whole care pathway, in which nurses are always present. Our results lead to conclusion that nurses could be ready to develop this program, work on PBM strategies not only directly in the hospital wards but also in the educational, organizational, and managerial field, even if the senior part of the sample considers this topic important for the junior workers to develop and put in practice. As according to Shander et al. (3), PBM provides

a “multidisciplinary framework for patient-centred decision making”. Seniors’ experience has to be recruited and used to guide junior nurses towards a full decision-making process that has patients at its centre. The PBM approach can be an important part of this process, therefore senior nurses must be the target of PBM training together with younger workers, to guide their learning process and be more competent themselves for patients’ sake. The limitations of this study are related to the small number of respondents to the survey. The investigated topic is relatively new, and we anticipated a possible difficulty in obtaining answers. However, also because the topic is relatively new, the finding of this study offer new, potentially useful information for future studies.

**Declaration:** Università degli Studi di Firenze, Scienze della Salute Umana, thesis discussion 612197/25.01.2020

**Conflicts of Interest:** Each author declares that he or she has no commercial association (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangements et.) that might pose a conflict of interest in connection with the submitted article.

## References

- Abraham I, Sun D. The cost of blood transfusion in Western Europe as estimated from six studies. *Transfusion*. 2012;52(9):1983–8.
- Goodnough LT, Shander A, Spence R. Bloodless medicine: clinical care without allogeneic blood transfusion. *Transfusion*. 2003;43(5):668–76.
- Shander A, Goobie SM, Warner MA, et al. Essential role of patient blood management in a pandemic: a call for action. *Anesth Analg*. 2020;
- Mueller MM, Van Remoortel H, Meybohm P, et al. Patient blood management: recommendations from the 2018 Frankfurt Consensus Conference. *Jama*. 2019;321(10):983–97.
- Goodnough LT, Shander A. Blood management. *Arch Pathol Lab Med*. 2007;131(5):695–701.
- WHO. WHO global forum for blood safety: patient blood management. Dubai WHO. 2011;
- Murphy MF, Goodnough LT. The scientific basis for patient blood management. *Transfus Clin Biol*. 2015;22(3):90–6.
- Leahy MF, Hofmann A, Towler S, et al. Improved outcomes and reduced costs associated with a health-system-wide patient blood management program: a retrospective observational study in four major adult tertiary-care hospitals. *Transfusion*. 2017;57(6):1347–58.
- Goodnough LT, Shander A, Riou B. Patient blood management. *J Am Soc Anesthesiol*. 2012;116(6):1367–76.
- Resar LMS, Wick EC, Almasri TN, Dackiw EA, Ness PM, Frank SM. Bloodless medicine: current strategies and emerging treatment paradigms. *Transfusion*. 2016;56(10):2637–47.
- Franchini M, Marano G, Veropalumbo E, et al. Patient Blood Management: a revolutionary approach to transfusion medicine. *Blood Transfus*. 2019;17(3):191.
- Gomez E, DeAngelis M, Liu H. Blood Conservation Strategies and Bloodless Medicine. *Essentials Blood Prod Manag Anesth Pract*. 2021;129–34.
- Vaglio S, Prisco D, Biancofiore G, et al. Raccomandazioni per l’implementazione del programma di Patient Blood Management. Roma Cent Naz Sangue luglio. 2015;
- Liumbruno GM, Vaglio S, Grazzini G, Spahn DR, Biancofiore G. Patient blood management: a fresh look at a new approach to blood transfusion. *Minerva Anesthesiol*. 2015;81(10):1127–37.
- Stokes Y, Vandyk A, Squires J, Jacob J-D, Gifford W. Using Facebook and LinkedIn to recruit nurses for an online survey. *West J Nurs Res*. 2019;41(1):96–110.
- Bethel C, Rainbow JG, Dudding KM. Recruiting nurses via social media for survey studies. *Nurs Res*. 2021;70(3):231–5.
- Taherdoost H. How to design and create an effective survey/questionnaire; A step by step guide. *Int J Acad Res Manag*. 2016;5(4):37–41.
- Barchielli C, Marullo C, Bonciani M, Vainieri M. Nurses and the acceptance of innovations in technology-intensive contexts: the need for tailored management strategies. *BMC Health Serv Res*. 2021;21(1):1–11.
- Pavenski K, Howell A, Mazer CD, Hare GMT, Freedman J. ONTraC: a 20-year history of a successfully coordinated provincewide patient blood management program: lessons learned and goals achieved. *Anesth Analg*. 2022;135(3):448–58.
- Roman MA, Abbasciano RG, Pathak S, et al. Patient blood management interventions do not lead to important clinical benefits or cost-effectiveness for major surgery: a network meta-analysis. *Br J Anaesth*. 2021;126(1):149–56.

## Correspondence:

Received: 20 October 2022

Accepted: 7 February 2023

Chiara Barchielli, Ph.D.

Health and Management Laboratory, Department of Management,

Scuola Superiore Sant’Anna, Pisa.

Piazza Martiri della Libertà 33 - 20122 Pisa, Italy

E-mail: chiara.barchielli@santannapisa.it

ORCID: 0000-0003-3084-1970