



# Reflection and Reflective Practice in General Practice: A Systematic Review Exploring and Evaluating Key Variables Influencing Reflective Practice

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## **Authors' contributions**

*This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.*

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## **ABSTRACT**

**Background:** Reflective practice is an essential part of general practice involving the trainee and the practitioners and the mechanism to promote this is the creation of portfolios to monitor evidence of reflective practices needed as part of licensing and revalidation in the United Kingdom

**Aim:** Evaluate the existing evidence about reflection and reflective practice models, utility, quality, significance, and implication for practice in General practice.

**Methodology:** Systematic databases search include Medline/PubMed, Embase, Cochrane CENTRAL, ERIC, and google scholar, limited to the last twenty years from January 2000 to January 2020.

**Results:** There were eight observational studies with 236 patients with over 90 percent of evidence that reflective practice is a tool for learning and development with poor evidence on the scale of measurement of reflective practice. No evidence for the effect of reflection on patient care. All evidence is level 2- with a grade C recommendation.

**Conclusion:** This systematic review of findings from eight studies of reflective practice in general practice. Relevant literature supports reflection as a learning tool and process for mandatory

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assessment of performance and appraisal. In contrast, there is an overwhelming distaste for the current structure of e-portfolio for written reflection. There is no evidence for the effect of reflection on patient care and currently no standard scale of measurement to assess the quality of reflection in general practice.

**Keywords:** *Reflect; reflection; reflective practice;; portfolio; general practice; primary care; general practice trainee; general practitioners.*

## 1. BACKGROUND

The reflective practitioner concept was first introduced in 1983 by Schon 1983 [1]. The essential qualities of competent and well-trained healthcare professionals like the general practitioner are reflection and reflective practices as enumerated in medical education literature [2,3,4,5]. Reflection and reflective practice are mandatory for revalidation by the General medical council [6]. The development of all the GP core capabilities is underpinned by reflection and reflective practice ability [7]. Reflection can be described as a purposeful and critical analysis of knowledge and experience for the production of deeper knowledge meant to gain adequate understanding and for future intervention [4].

Reflection in general practice can be a key to tailoring professional functioning of patients' needs or new conditions in the absence of an obvious solution to formation of new knowledge and practice as a drive to lifelong and professional learning and development and ultimately producing valuable insight to address patient needs in particular and community needs in general. Personal reflection is a validated means of obtaining and maintaining balanced professionalism along the continuum of medical education [8,9].

Literature is replete with numerous forms of reflection and reflective practices including mindful practice [10], emotional awareness [11], learning from experience [12], critical learning [13], assumption [14], morality [15] and deep learning[16].

Reflective practice is an essential part of general practice involving the trainee and the practitioners and the mechanism to promote this is the creation of portfolios to monitor evidence of reflective practices needed as part of licensing and revalidation in the United Kingdom [17]. However, the evidence to support and inform interventions and innovations in reflective practices remains majorly theoretical [18]. The

use of reflective practice and reflective learning using electronic portfolios is seen largely as an educational tool for training and professional development, there is little evidence that portrays that reflection improves the quality of care [19]. General practice trainees (GPST) engage in a lot of written reflection as a significant part of workplace-based assessment however, written reflection has come under intense criticism as sometimes being done hurriedly, superficial in quality and quantity, limited by time constraints hence making e-portfolio in its present form may not be the most appropriate tool for enhancing reflective writing for reflective practice [20].

Personal reflection in General practice is synonymous with appraisal and inspection of their experience and practice for the benefits of learning and development. Reflection is relevant in understanding further patient care or circumstances especially when there is no obvious, immediate or inadequate solution when GP has had regular contact with the same patients for a while.

Nguyen et al, 2014 [21] define reflection as "*the process of engaging self in attentive, critical, exploratory and iterative interactions with one's thoughts and actions, and their underlying conceptual frame, to change them and with a view on the change itself*".

Reflective practice is 'the process whereby an individual thinks analytically about anything relating to their professional practice to gain insight and use the lessons learned to maintain good practice or make improvements where possible'.(COPMED 2018 [22].

Gibbs [23] is one of the early proponents of reflective practice who developed the reflective cycle which included six stages of how children learn through first-hand experiences, or 'learning through doing. He described the reflective cycle as a circular process by which our thoughts affect our actions, which affects the situation we are dealing with and therefore after feedback

through the reactions of others involved which can affect how we understand and think about the situation. Gibbs’s method has been modified further in General practice training as a useful tool for reflective practice.

There are different ways to reflect and document those reflections. The GMC does not require any specific documentation, only evidence that it is being carried out effectively. Documentation of reflection can involve writing personal notes in CPD and appraisal portfolios or training portfolios, or, if reflection is undertaken as part of a dialogue with trainers, this can be recorded as a workplace-based assessment/supervised learning encounter. A written record of reflection may be made at any time. All details of those involved in a reflective event – patients, colleagues, relatives, etc – must be fully anonymized to comply with confidentiality and information governance requirements. Similarly, precise locations, dates, and times should not be specified, and separating the timing of the reflective documentation of an event and its actual occurrence may help to achieve this.(COPMED 2018, tool kit for reflective practice [22].

Reflection and reflective practice are integral parts of maintaining and enhancing competence in professionalism which needs to be developed throughout training and beyond. The effectiveness is evidenced in the RCGP portfolio with trainer and supervisor apparatus for feedback [24]. This has become a tool for accountability, monitoring appraisal of training and practice. It is essential to evaluate how

effective current practice training and CPD development can encourage robust reflection and reflective practice. However effective and result-oriented reflective practice is very difficult in the final year of GP vocational because the majority of time is spent in preparing for the MRCGP exam.

This research study aims to evaluate the existing evidence about reflection and reflective practice models, utility, quality, and significance in General practice.

## 2. METHODOLOGY

Systematic databases search include Medline/PubMed, Embase, Cochrane CENTRAL, ERIC, and google scholar, limited to the last twenty years from January 2010 to January 2020. Keywords were mapped to Medline Medical Subject Heading (MESH) as well as search for text items, A filter for identification of research limited to general practice was used to filter out irrelevant studies. Furthermore, hand searches of references of cited journals were conducted to also identify potentially eligible studies. Search terms include: reflect, reflection, reflective practice, portfolio, general practice, primary care, general practice trainee, general practitioners. Inclusion criteria are articles on reflection and reflective practice in General Practice, limited to the last 20 years, publication In English. Exclusion criteria are research studies that did not describe reflection or reflective practices in General Practice, letters to journals, commentaries, and conference proceedings.

### 2.1 Included Studies

Table 1. Included studies

Study	Methods	Sample size	Country
Curtis 2016 [25]	Qualitative Focus group study	25	UK
George 2013 [26]	Qualitative Mixed evaluation	25	UK
Pelgrim 2012 [27]	Qualitative Task evaluation study	54	Netherlands
Bethune 2007 [28]	Qualitative In-depth Interview	8	Canada
Mamede 2005 [29]	Questionnaire	202	Brazil
Mamede 2004 [30]	Observation, cross session	202	Brazil
Pearson 2004 [31]	Observation cross session	92	UK
Mathias 2002 [32]	Qualitative Semi-structured	32	UK

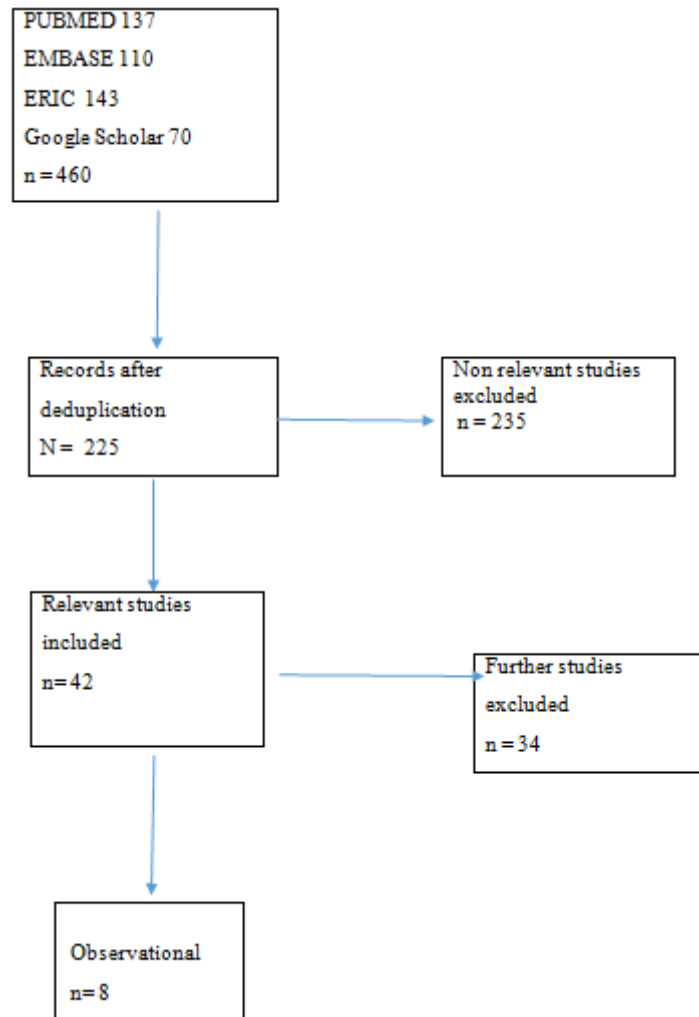


Fig. 1. Search flow

### 3. RESULTS

Relevant questions and significant issues following the results of this review are structured to reflect the summaries of relevant studies about General Practice and General Practitioners however, more than one question may be addressed by several studies as shown in Fig. 1 and Table 1.

#### 3.1 Role of Reflection and Reflective Practice in General Practice

Reflection and reflective practice form an essential framework that serves as a bridge between knowledge obtained from studies and practice displayed in the workplace hence this enables General practitioners to inculcate new knowledge and experience within the cognitive framework for optimum safe and sound

outcomes. Studies that looked at the role of reflection in enhancing residents' learning found that graduates who received instruction in reflection continued to engage in reflective practice after training leading to personal growth over time as a result of experience and new understanding. This is in keeping with Schön's reflective practice model [33] and Moon's concept that reflection is the path from superficial to deep learning [33]. All the eight studies explored agreed that reflection and reflective practice is majorly a tool for learning and development in general or family practice.

Bethune & Brown (2007) conducted a qualitative study using in-depth interviews exploring Family Practice resident experience of reflective practice with the use of a semi-structured case-based reflection exercise as a learning medium. These were graduates of the Family Practice residency

program in active practice, eight interviews were conducted over two years that included 5 women and 3 men. Three major roles of reflective practice were evident in this research which are surely relevant as strategies for GPs to incorporate new knowledge and understanding into professional reflection and reflective practice. According to Bethune and Brown (2007), the reflection exercises as a continuing education process offered participants a strategy for future learning in practice secondly the exercises offered a different perspective on the patient-doctor interaction that had doctors looking for cues to deeper meaning; and thirdly the exercises engaged the learners in a reflective process that revealed qualities about themselves that gave them personal insight. The participant's feedback was entirely positive, they see reflection as a great tool for self-directed teaching and learning that will produce deeper introspection to explore answers to clinical tasks or challenges, also the exercise appeared to have a significant impact on the interaction between the participant and their patients especially as they explore "depth of field" in consultation searching for clues to unlock the communication, this enhanced their ability to listen and also value their professional work. In addition, the participants agreed that this exercise has produced growing confidence in their skills as family physicians and also foster better relations with their patients leading to effective continuity of care. Hence case-based discussion incorporating reflection is a strategic part of the GPST as evidenced in the e-portfolio of workplace-based assessment.

George et al. [26] explore the role of reflection skills as self-directed learning skills to facilitate physicians' life-long learning. The study was conducted from 2008–2010 at the Brown Family Medicine Residency in Pawtucket, Rhode Island. During individual monthly meetings with the learning coach or mentor or trainer, residents entered their learning goals and reflections into an electronic portfolio. A mixed-methods evaluation, including coach's ratings of goal setting (termed as professional development plan in General practice in the UK) and reflection, coach's meeting notes, portfolio entries, and resident interviews, was used to assess progress in residents' SDL abilities.

Curtis et al. [25] carried out a focus group study on what does General practitioners think of written reflection, General practitioners in training (GPST) were also included including 25

participants in total, and some GP and GPST find written reflection useful describing it as a tool for assessment of learning and also for appraisal. However, there were only three focus groups characterized with divergent and complementary views on written reflection. In the same vein Pelgrim et al. [27] explored the quality of written narrative feedback and reflection in a modified mini-clinical evaluation exercise analyzing 485 completed modified mini-CEX completed by 54 GP trainees and their trainers were all seen reflection as a tool for assessment of learning and appraisal, however, self-reflection by trainees and action plan formulation were not reported uniformly on the assessment forms.

Mamede et al. [30] conducted a questionnaire-based study on the structure of reflective practice in Medicine where they sampled opinions of 202 primary care doctors, this study revealed the assumption that primary care doctors who reflect regularly on their professional work and learn from their practice may serve their patients better on the long run than those who do not, hence they see reflection as a tool for improving professional practice.

Mathers et al. [32] performed a quantitative study on thirty-two GPs divided into two cohorts and observed for over six months to examine the comparison between traditional continuing medical education (CME) and portfolio-based learning integrating the use of reflection learning among general practitioners. This study demonstrates that written reflection using portfolio-based learning is a tool for more focused, targeted, and monitored learning with effectiveness and achieving of goals more for the portfolio cohort compared to the traditional CME. In addition, Pelgrim et al [27] following completed 485 forms by 54 General practice specialty trainees (GPST) using written reflection model, the study further demonstrates written reflection as a tool for focused learning among trainees with regards to specific tasks guided by feedback from GP trainers or educational supervisor of named GP trainee.

In the same vein, other studies by George et al, Pearson et al, Mamede et al. [26,30,29] see reflection and reflective practice as a tool for learning and development.

### **3.2 Effectiveness of Reflective Practice in General Practice**

Reflective practice in the UK is an obligatory aspect of learning, assessment, and appraisal for

GPST and GP, particularly in the form of written reflection aimed to demonstrate progressive learning. How effective is compulsory written reflective practice? Three studies explored the effectiveness of reflection in General practice. Curtis et al. [25] examined a total of 25 GPs and GPSTs in a focus group study and reported that though seen as a useful learning process, it's mainly to provide evidence for learning and is a task or tick-box exercise to be performed but another focus group sees written reflection as a tool to demonstrate progressive learning and changes in their practice.

Pearson et al. [24] conducted a survey of GP registrars on Portfolio use in general practice vocational training exploring the views of 77 GP registrars with the use of postal questionnaires and structured in-depth research. Experienced registrars were found to least interact with a portfolio as a tool for reflective practice, information recorded daily by 65 percent and portfolio was used in reflective learning by less than half (42 percent) and most essentially those with supportive and encouraging trainers and educational supervisors consistently engaged the portfolio more in reflective practice. Hence trainer and educational supervisor role will a long way to positively or negatively impact portfolio-based learning which raises a question of the acceptability of portfolio reflection by trainers or educational supervisors. Many of the respondents see portfolio reflection as useful while others see it as a tool to fulfill an educational need.

Mathias et al. 2002 [32] conducted a qualitative study on "portfolios in continuing medical education – effective and efficient?" This study involves thirty-two GP divided into two cohorts who submitted portfolio reflection entries for six months findings revealed that all the participants agreed portfolio based reflection allow them to achieve their pre-specified learning objectives and also allow for great flexibility in learning methods and time management with regards to educational activities which is seen as a beneficial effect in the diversification of learning. The findings showed that GP preparing for the portfolio-based learning spent mean hours of about  $24.5 \pm 12$  (SD) which was significantly more than the 15 hours of post-graduate educational allowance (PGEA) awarded. At a time in the past PGEA was seen as a revolution that changed the face of continued medical education by use of inducement means to

stimulate GPs to accumulate CPD credits towards their specified allowance.

However, the amount of paperwork involve and time to regularly maintain portfolio reflection made it burdensome and less attractive. The role of mentors has also seen effective terms in encouraging consistent reflection.

### **3.3 Assessment of Reflection and Reflective Practices**

Assessing reflection and reflective practices in general practice has led to improved learning of trainees and trainers and those involved in appraisal for revalidation learned tools for analyzing problems solving and clinical decision process of trainee GP but the question is how valid and reliable is this method of assessment. Grading of reflective practice especially in GPST workplace-based activities which is a significant part leading to the award of MRCGP qualification just like the applied knowledge test (AKT) and CSA ( clinical skill assessment) has been a challenge leading to subjectivity on the feedback assessment by GP trainers and educational supervisors because there is no valid and reliable measuring scale for reflective activities. Three studies attempted to explore assessment but Mamede et al 2009 try to base their assessment on a reflective structure which made need further research to explore the generalisability of this.

Curtis et al. [25] performed an online survey of about 1005 GPs and GPST on their views about written reflection in assessment and appraisal Three quarters disagreed that written reflection is a way of identifying poorly performing GPs. More than 70% of respondents stated that summative, written reflection is a time-consuming, box-ticking exercise that can lead to distraction from other learning. Its validity as a part of the assessment was questioned and they believed that its use may contribute to difficulties with General Practitioner recruitment and retention.

Mamede & Schmidt [30] in their study of the structure of reflective practice in medicine involving 202 primary care doctors identified constituent elements of multidimensional reflective practice which are generally considered essential for the development of expertise that can be maintained throughout professional life. They identified the multidimensional five factors of reflective practice by the use of an 87-item questionnaire of which 65 were related to

reflective practice. The five-factor model of reflective practice and their reliability were deliberate induction ( $\alpha = 0.83$ ), deliberate deduction ( $\alpha = 0.81$ ), testing and synthesizing ( $\alpha = 0.79$ ), openness for reflection ( $\alpha = 0.86$ ) and meta-reasoning ( $\alpha = 0.68$ ). This finding implies that it is possible to measure, among doctors, differences in approach to difficult medical problems. Some doctors have more tendencies to approach these medical problems reflectively whereas others may do this less routinely. The second implication is that reflection or reflective practice is not an abstract process, it can be taught, developed, and assessed at different levels.

Currently, in the GPST, there is no standardized, valid, or reliable scale of measurement and assessment of personal reflective entry by clinical or educational supervisor which has led to increased objectivity in feedback which has positively and negatively impacted trainee progress. Pelgrim et al. [27] assessed the quality of written feedback and reflection of 54 trainee GP with no definite scale of measurement of the written reflection. The findings showed that feedbacks comments after assessment of the quality of reflection were specific, substantial, and different inconsistency between trainer-trainee pairs.

### **3.4 The Outcome of Effective Reflection and Reflective Practices**

How effective is the reflective practice currently in General practice? There has been huge criticism of written reflection as sometimes being superficial, hurriedly prepared, limited by time constraints, especially with the use of e-portfolio which has been suggested that in its current form may not be the most appropriate way of stimulating and encouraging written reflection [20].

Mathias et al. [32] showed that GP that engaged in portfolio-based learning with the use of reflection tools can meet their professional needs, encouraged active and peer-supported learning thereby increasing their personal and professional confidence in comparison to the PGEA cohort.

### **3.5 Relationship between Reflective Practice and Clinical Experience**

Reflection on practice and learning from experience are considered invaluable ingredients to acquire and maintain expertise in medical

practice [34]. One study established a relationship between reflective practice and clinical experience.

Mamede et al. [29] conducted a qualitative study on a correlate of reflective practice in Medicine, this was carried out with the use of self-administered questionnaires to 202 primary care physicians working in primary care in major cities of the Brazilian state of Ciera' who had on average almost 17 years of practice (SD = 10.45). The average number of patients seen each week was 148.31 (SD = 91.46) and the average amount of time spent on each patient was 14 minutes. The mean of reflective practice scores for the physicians with less than 8 years of practice was 3.13 (SD = 1.10) and in comparison to those practicing for more than 24 years, it decreased to 2.75 (SD = 0.67), this shows that reflective practice is negatively related to Primary care physician age and number of years practice, reflective practice tend to decrease with experience. Furthermore, this study showed that primary care physicians whose first workplace was hospital setting engaged in reflective practice more than those in a primary care setting and also who had specialty based training or posting in Internal Medicine, pediatrics and Public health engage in reflective practice more extensively than Gynaecology and Obstetrics counterpart in primary care. Regular continued professional development is required to reverse this trend. However human memory research revealed a general agreement that performance losses are age-related, but that the losses do not occur in all memory tasks [35,36].

### **3.6 Effect of Reflection and Reflective Practices in Patient's Care**

Reflective practice has been seen as a significant tool for developing clinical skills and improving clinical judgment which ultimately impacts on patient's outcome positively or negatively but currently in evidence in General practice proves this. Quality and safety are two paramount pillars of patient outcome, newly qualified GPs can struggle to integrate this in their practice at the start but reflective practice is a bridge to connect quality and safety to patient outcomes. There is no single study in this review that showed the effect of reflective practice on patient care but can be theoretically explained that reflective practice can translate into better patient care outcomes. This is a call for further research to explore this research condition.

### 3.7 Barriers to Effective Reflective Practices

Identifying barriers of effective reflective practices are relevant to progress in effective reflection, two studies identify a few barriers in this review.

Mamede and Schmidt [29] identified two correlates of reflective practice by primary care doctors including the decline of reflection with increasing years of practice and secondly reflection was lower in primary care setting as compared to hospital care setting due to time pressure in a busy clinical environment synonymous to most GP surgeries today with an increasing number of patients to see.

Pearson and Heywood [24] studied portfolio-based learning with the use of written reflection, many GP and GPST found the portfolio not useful, especially in the absence of supportive and encouraging trainers and educational supervisors. The development of reflection in the current training structure of General practice in the UK is not encouraging reflective practice, especially in the final year of the GPST where you have GP registrars (potential GPs) focus more on AKT and MRCGP exam preparation with less time and opportunity to reflect and develop reflective practice.

## 4. DISCUSSION

Reflection and reflective practice may serve as a viable tool and learning strategy that may allow general practitioners and GP trainees to connect effectively with new learning, pre-existing experience, and skills with possible future possibilities in a clinical environment. Collaborative and personal reflection is essential in a multidisciplinary team where underlying cognitive approaches and values of other co-professionals [37]. Reflection with objective feedback is a good way to explore one are of weaknesses and strengths which ultimately will lead to improved practices. Having analyzed over 35 research studies included in this systematic review largely observational studies with non-robust methodology lacking in terms of sample size and rigor, undefined comparison group, and most essential no randomized studies on this subject to date. However, this literature review led to the identification of certain benchmarks in reflective practice that can form core foundation and direction for future research in this field, and also findings revealed in this research will be

food for thought for developing subsequent curriculum for postgraduate specialty training in General practice and re-designing of electronic portfolio for written reflection.

In the light of our finding, reflection models used in general practice is founded on the work of Donald Schon and John Dewey, Schon maintained that reflection was stimulated when practitioners are often confronted with a situation of uncertainty, instability, uniqueness, and value conflict [1] This is interpreted in general practice as complex medical scenarios that will produce "knowing in action and reflection in action". While becoming a reflective practitioner in general practice is a worthwhile disposition to imbibe and developed but the strength of reflective practice ought to be explored beyond the confines of Dewey and Schon's model. According to established models of reflection, personal growth is a process that occurs over time as new understanding is produced by experiences that will inform and instruct new practice which is termed horizontal reflection while vertical reflection can progress from superficial reflection to deeper reflection stimulated by critical synthesis.

However, the entire General Practice reflective mechanism is based on the Gibbs model [23] developed the reflective cycle which included six stages of how children learn through first-hand experiences, or 'learning through doing' and afford an opportunity for feedback with the use of portfolio for written reflection.

A study by Mamede and Schmidt [30] showed a negative correlation between reflection and years of practice, increasing years of practice lead to less reflective practice, possibly due to robust experience in practice that reduces encounter with complex problems for which reflection is a strategy of intervention.

More recent models of reflection have identified the need for reflexivity which according to Fook [38] is defined as "a stance of being able to locate oneself in the picture, to appreciate how one's self influences [actions]. Reflexivity is potentially more complex than being reflective, in that the potential for understanding the myriad ways in which one's presence and perspective influence the knowledge and actions which are created is potentially more problematic than the simple searching for implicit theory". In general practice, the difference between reflection and reflexivity is very blurred because it's very difficult



to reflect on a case or task without some element of reflexivity.

Several studies so far defined the role of reflection in general practice as a tool for continuous or lifelong learning to improve further practice which is the ultimate goal of reflection, however, it can also be used as a tool for professional competence [33]) and to demonstrate ongoing learning as a mandatory part of licensing and revalidation in the UK[17]. The compulsory nature of the role of reflection has led to it being a tick-box exercise and rituals that GP and GPST want to quickly do away, this impacts the quality of reflection, and also GP feels limited from being open and honest about their reflection [25].

Bethune and Brown [28] demonstrated in their study that written reflection informed their strategies for future learning and influenced patient interactions. This is another role of reflection as a strategy for future learning and tool to enhance patient interaction.

Effectiveness of written reflection was demonstrated by evidence which borders on adverse impact on another learning opportunity with regards to time spend in reflection especially by a large majority of GPST because it is mandatory for qualification, this has led to a variety of feelings including anger, resentment, and frustration about the reflection process [25]. Hence the validity of mandatory written reflection as a tool for assessment of performance by GPST is questionable due to overwhelming distaste and lack of support of the current process of reflection [25].

## 5. IMPLICATION FOR PRACTICE

Reflection is a skill to be learned and a standardized framework to guide and monitor progress will be helpful, current electronic portfolio for GPST lacks great support as a tool for reflection.

Reflection should be seen more as a tool for learning to bridge the gap between knowledge and practice, not just as an obligatory tick-box ritual for assessment of performance and appraisal.

Ample evidence suggests that people are more likely to reflect if they are well supported and encouraged by their Educational supervisor or trainer, negative feedback should be constructive

and well situated not to dissuade trainees from reflective practice. In addition, the practice environment must encourage a culture of reflective practice as proponent and champions of reflective practice.

## 6. LIMITATION OF STUDY

This review is limited by a small number of original studies, small sample size, lack of comparison groups, no randomized studies, and lack of a standardised tool to assess reflection and reflective practice.

## 7. CONCLUSION

Reflection and reflective practice can be seen as a tool and strategy to enhance and maintained learning, empathy, and professionalism in GP and GPST. Relevant literature support reflection as a learning tool and process for mandatory assessment of performance and appraisal. In contrast, there is an overwhelming distaste for the current structure of e-portfolio for written reflection. There is no evidence for the effect of reflection on patient care and currently no standard scale of measurement to assess reflection in general practice which requires further research.

## 8. RECOMMENDATION

Despite strict inclusion and exclusion criteria of reflection and reflective practice in general practice over 95% of all the evidence available were in support of reflection and reflective practice as a significant tool for learning and development no robust evidence on the scale of measurement and assessment of reflective practice and currently no evidence on the effect of reflective practice on safety and quality outcome of patient care. All the available evidence in this review was from observational studies with small sample size. In summary, all evidence I level 2-, grade C recommendation [39], not valid enough to change practice or influence trainee policy. Further randomized controlled study needed for valid and reliable evidence meet for generalization.

## DISCLAIMER

The products used for this research are commonly and predominantly used products in our area of research and country. There is absolutely no conflict of interest between the

authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

## CONSENT

It is not applicable.

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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